YAESU

DUAL BAND FM TRANSCEIVER

FTM-350R

OPERATING MANUAL

Contents

RESET PROCEDURE

When key functions are lost, or erratic operation is encountered, you may ***clear all settings*** of the transceiver and set them to the factory default with the following procedures:

1. Turn the radio "off".
2. Press and hold in the key located to the left of the [**POWER**] switch while turning the radio on, to enter the "Special Function" mode.
3. Rotate the *left side* [**DIAL**] knob to select "**6 ALL RESET**".
4. Press the *left side* [**DIAL**] knob and confirm that (**OK?** [**SET**]) is displayed on the LCD.
5. Press the *left side* [**DIAL**] knob once more to complete the reset procedure.

FRONT PANEL CONTROLS & SWITCHES

[FWD]/[BCK] (PAGE) KEY

Press these keys briefly to select the operating function pages.

The available pages are: "**Radio**" page, "**Timer**" page, "**Baro/Alti**" page, "**Navigation**" page※, and "**GPS Status**" page※.

※: Requires optional "**FGPS-1**" GPS Unit.

Press and hold in these keys toggle the Dual Receive feature "on" and "off".

[SET] (SET MODE) KEY

Press this key to access the Set Mode.

[DIAL] KNOB

☐ Rotate this knob to select the operating frequency (or memory channel) of the *left side* receiver.

☐ Press and hold this knob for one second to enable to tuning the VFO frequency in 1 MHz step.

☐ When the *left side* receiver is set to "Main" band, press this knob briefly to activates the Band Scorp feature.

☐ When the *leftside* receiver is set to "Sub" band, press this knob briefly to change the *left side* receiver to "Main" band.

[PTT] KEY

Press this key to transmit.

[B] (BAND) KEY

Press this key to change the operating band of the Main band.

Available bands are:

Left Band:　AM Radio, FM Radio, 144 MHz Band, 430 MHz Band, and Audio Line-In

Right Band: 144 MHz Band and 430 MHz band

You may assign the other function to this key. See page 36.

[F] (FUNCTION) KEY

Press this key to change the current functions of the [**SMART FUNCTION**] keys.

[DIAL] KNOB

☐ Rotate this knob to select the operating frequency (or memory channel) of the *right side* receiver.

☐ Press and hold this knob for one second to enable to tuning the VFO frequency in 1 MHz step.

☐ When the *right side* receiver is set to "Main" band, press this knob briefly to activates the Band Scorp feature.

☐ When the *right side* receiver is set to "Sub" band, press this knob briefly to change the *right side* receiver to "Main" band.

Display

FWD BCK SET　145.000　433.000　PTT B F
H　　　　　H　　　　　D
F-1　V/M　SQL　LOCK　REV　POW

MICROPHONE

[VOL] KNOB

Adjusts the *left side* receiver's audio volume.

[VOL] KNOB

Adjusts the *right side* receiver's audio volume.

[SMART FUNCTION] KEY

These four keys select many of the most important operating features of the transceiver.

When changing the operating function page or pressing the [**FUNCTION**] key, the current function of these key will change and appear above each keys.

[POWER] SWICTH

☐ Press and hold this key for two seconds to toggle the transceiver's power on and off.

☐ Press this key briefly while the transceiver is turned on to toggle the key lockout feature on or off.
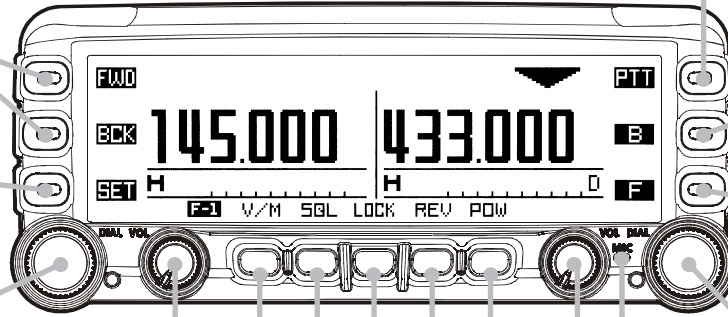
TIMER PAGE OPERATION

"CLOCK"
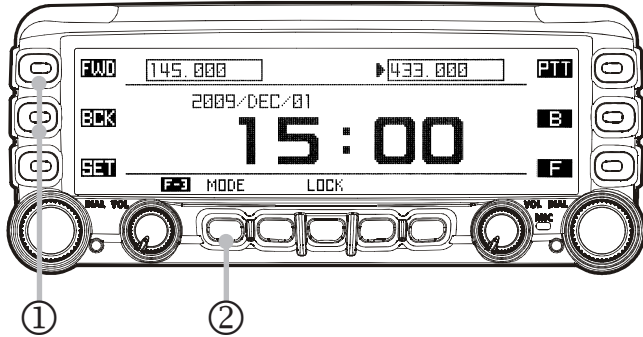
① Press the [**FWD**] or [**BCK**] key repeatedly, until the "Timer Page" appears.
② Press the [**MODE**] key repeatedly, until the "Clock" appears.

To return to the "Radio" page, press the [**FWD**] or [**BCK**] key repeatedly, until the "Radio" Page appears.

The **FTM-350**'s clock is setup from the Set mode item "**I01 DATA&TIME ADJUST**" in the "**TIMER/CLOCK**" group. See page 39 for details.

"COUNT UP" TIMER

① Press the [**FWD**] or [**BCK**] key repeatedly, until the "Timer Page" appears.
② Press the [**MODE**] key repeatedly, until the "Count Up" timer appears.
   The "Count Up" timer has two kinds: which is with Lap function and without Lap function.
③ Press the [**SETUP**] key to set the interval time of the timer beep: rotate the [**DIAL**] knob to select the interval time, then press the [**SETUP**] key.
④ Press the [**START**] key to initiate the "Count Up" timer.
⑤ Press the [**LAP**] key to save the lap time, if desired (up to four laps).
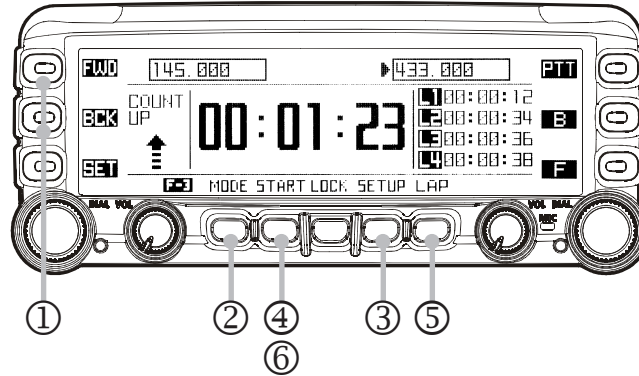⑥ Press the [**STOP**] key to stop the "Count Up" timer.
⑦ Press and hold the [**START**] key for two seconds to reset the "Count Up" timer.

When the optional GPS antenna is connected, the average speed, or the maximum speed of your vehicle may be displayed instead of the lap function, by pressing the [**MODE**] key again. Press the [**DISP**] key to switch between average and maximum speed.

To return to the "Radio" page, press the [**FWD**] or [**BCK**] key repeatedly, until the "Radio" Page appears.

"COUNT DOWN" TIMER
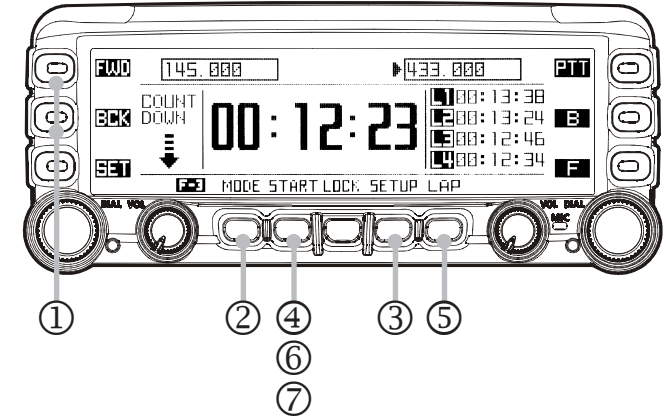

① Press the [**FWD**] or [**BCK**] key repeatedly, until the "Timer Page" appears.
② Press the [**MODE**] key repeatedly, until the "Count Down" timer appears.
   The "Count Down" timer has two kinds: which is with Lap function and without Lap function.
③ Press the [**SETUP**] key to set the setup time: rotate the [**DIAL**] knob to select the setup time, then press the [**SETUP**] key.
④ Press the [**START**] key to initiate the "Count Down" timer.
⑤ Press the [**LAP**] key to save the lap time, if desired (up to four laps).
⑥ Press the [**STOP**] key to stop the "Count Down" timer.
⑦ Press and hold the [**START**] key for two seconds to reset the "Count Down" timer.

When the optional GPS antenna is connected, the average speed, or the maximum speed of your vehicle may be displayed instead of the lap function, by pressing the [**MODE**] key again. Press the [**DISP**] key to switch between average and maximum speed.

To return to the "Radio" page, press the [**FWD**] or [**BCK**] key repeatedly, until the "Radio" Page appears.

RADIO PAGE BASIC OPERATION

The basic operations are listed numerically in the illustration below.
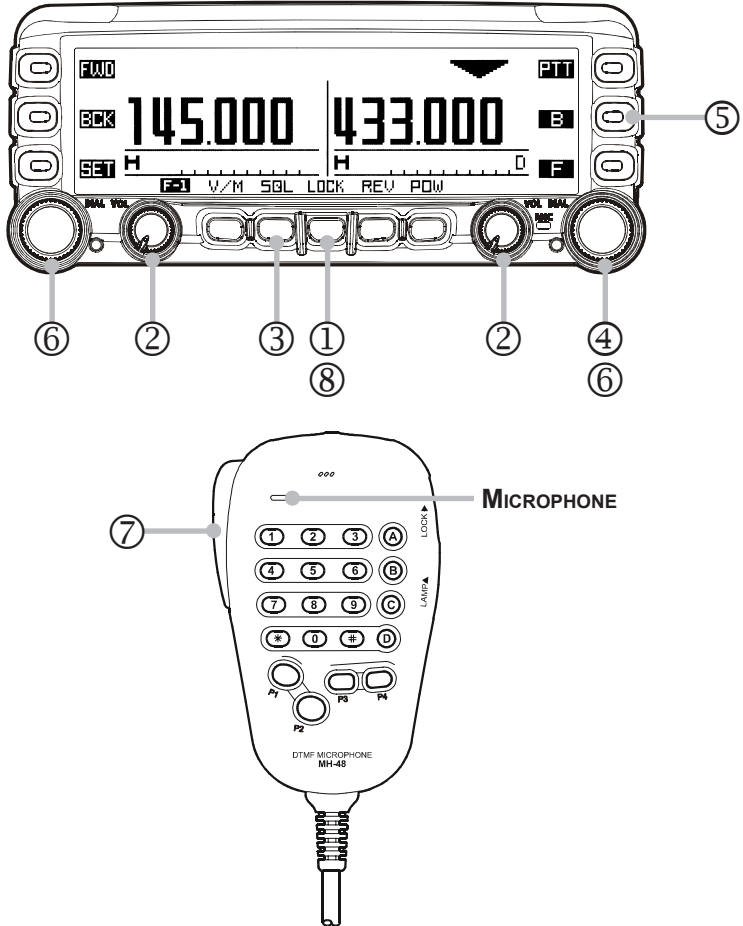
① Press and hold the [**POWER**] key for two seconds to turn the transceiver on.
② Rotate the [**VOL**] knob to adjust the audio volume level.
③ Press the [**SQL**] key briefly then rotate the [**DIAL**] knob carefully to adjust the squelch threshold level.
④ Press the [**DIAL**] knob briefly to set the "Main" band.
⑤ Press the [**B**] key to select the operating band of the "Main" band.
⑥ Rotate the [**DIAL**] knob to select the operating frequency.
⑦ Press and hold the [**PTT**] key, and speak into the microphone in a normal voice level.
⑧ Press and hold the [**POWER**] key for two seconds to turn the transceiver off.

[SMART FUNCTION] KEY

GENERAL

The **FTM-350** operations are performed using the [**SMART FUNCTION**] keys. The various functions of the keys are changed by pressing the [**F**] key.

[**SMART FUNCTION**] key   [**FUNCTION**] key
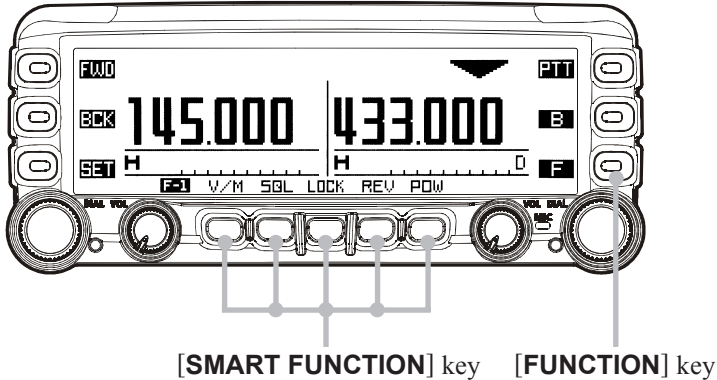
Pressing the [**F**] key repeatedly will change the function command of each [**SMART FUNCTION**] key as shown in the following tables. It is easy to recall and perform a desired operation. The current function of each key is shown in the display above the key button.

⦿ Default

F-1	V/M	SQL	LOCK	REV	POW
F-2	SCAN	DW	LOCK	SKIP※1	AD-F※2

⦿ When the optional Voice Guide Unit is installed.

F-1	V/M	SQL	LOCK	REV	POW
F-2	SCAN	DW	LOCK	SKIP※1	AF-D※2
F-3	●REC	X CLR	LOCK	▶PLAY	VOICE

⦿ When the optional Voice Guide Unit is installed and the APRS feature is activated.

F-1	V/M	SQL	LOCK	REV	POW
F-2	SCAN	DW	LOCK	SKIP※1	AF-D※2
F-3	S•LIST	MSG	LOCK	BCON	B-TX
F-4	●REC	X CLR	LOCK	▶PLAY	VOICE

⦿ Press and hold the [**F**] key for two seconds.

SQL	TYPE	T•FRQ	LOCK	D•COD	P•FRQ

※1: The [**SKIP**] command appears only in memory mode.
※2: You may change the [**AD-F**] command to another command with Set Mode item "**G05 F KEY**". See page 38.

[SMART FUNCTION] KEY COMMAND DETAILS

F-1	V/M	Press Key	Switches frequency control betwen the "VFO" and "Memory System".
		Press & Hold Key	Activates the "Memory Write" mode (for memory channel storage).
	SQL	Press Key	Activates the Squelch threshold level.
		Press & Hold Key	No Action.
	LOCK	Press Key	Toggles the key lockout feature "on and "off".
		Press & Hold Key	Toggles the transceiver power "on and "off".
	REV	Press Key	Reverses transmit and receive frequencies while working through a repeater.
		Press & Hold Key	No Action.
	POW	Press Key	Selects the desired transmit power output level ("LOW", "MID", and "HIGH")
		Press & Hold Key	No Action

F-2	SCAN	Press Key	Activates the Scanner.
		Press & Hold Key	No Action.
	DW	Press Key	Activates the Dual Watch feature.
		Press & Hold Key	No Action.
	LOCK	Press Key	Toggles the key lockout feature "on and "off".
		Press & Hold Key	Toggles the transceiver power "on and "off".
	SKIP	Press Key	Selects the "scan flag" to the current memory channel.
		Press & Hold Key	No Action.
	AD-F	Press Key	Activates the AF Dual function.
		Press & Hold Key	No Action.

F-3	S•LIST	Press Key	Opens the "Station List" window.
		Press & Hold Key	No Action.
	MSG	Press Key	Opens the "Message List" window.
		Press & Hold Key	No Action.
	LOCK	Press Key	Toggles the key lockout feature "on and "off".
		Press & Hold Key	Toggles the transceiver power "on and "off".
	BCON	Press Key	Changes the APRS beacon: ON, OFF or AUTO.
		Press & Hold Key	No Action.
	B-TX	Press Key	Transmits the APRS beacon.
		Press & Hold Key	No Action.

F-4	●REC	Press Key	Initiates the recording of the incoming receiver audio.
		Press & Hold Key	No Action.
	X CLR	Press Key	Clears the recording data.
		Press & Hold Key	No Action.
	LOCK	Press Key	Toggles the key lockout feature "on and "off".
		Press & Hold Key	Toggles the transceiver power "on and "off".
	▶PLAY	Press Key	Plays back the recorded data.
		Press & Hold Key	Selects the Voice Memory Register (slot 1 - 8, or ALL).
	VOICE	Press Key	Announces the operating frequency of the "Main" band.
		Press & Hold Key	No Action.

SQL	TYPE	Press Key	Selects the Squelch type.
		Press & Hold Key	No Action.
	T•FRQ	Press Key	Selects the CTCSS Tone frequency.
		Press & Hold Key	No Action.
	LOCK	Press Key	Toggles the key lockout feature "on and "off".
		Press & Hold Key	Toggles the transceiver power "on and "off".
	D•COD	Press Key	Selects the DCS code.
		Press & Hold Key	No Action.
	P•FRQ	Press Key	Selects the User Programmed Reverse CTCSS Tone frequency..
		Press & Hold Key	No Action.

MEMORY OPERATION

MEMORY STORAGE

Before beginning the Memory Storage operation, select the desired frequency while operating in the "Main" band VFO. Be sure to set up any desired CTCSS or DCS tones, as well as any repeater offset. The power level setting is also stored in the memory.
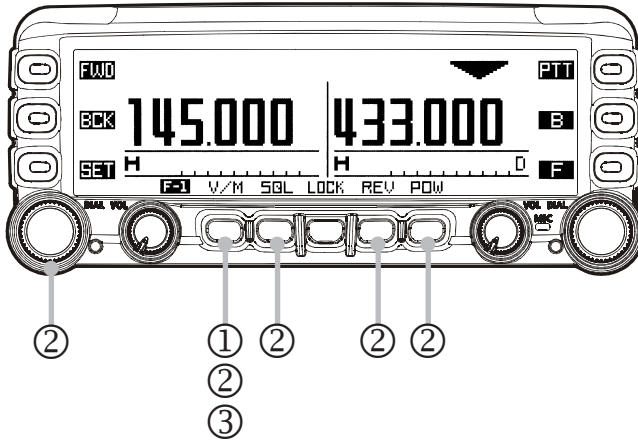
① Press and hold in the [**V/M**] key for two seconds to display the "Memory Edit" window.

② If you wish to append an Alpha/numeric "Tag" to this channel, press and hold the [**V/M**] key again. Then enter the desired name "Tag" (up to 8 characters) one of the methods shown in the following examples. Otherwise, skip to the next step.

Example 1: Enter the characters/numbers by pressing the microphone keypad buttons; or use the microphone [**UP**]/[**DWN**] keys to select them. Press the [**B**] key to move the cursor to the next digit. Press the [**A**] key to backspace the cursor, and press the [**C**] key to delete all data after the cursor. You may change the character (uppercase, lowercase, numeric, or symbol) by pressing the [✱] key.

Example 2: Rotate the *left side* [**DIAL**] knob to select a character/number and press the [➞] key to move the cursor to the next digit. Press the [**BS**] key to backspace the cursor. You may change the character (capital, small, numeric, or symbol) by pressing the [**FONT**] key.

Impotant Note

On rare occasions the stored data may become corrupted by miss operation, or static electricity. When repairs are made, the memory data may be lost. Please write down or record the memory information so you will be able to restore it if needed.

MEMORY OPERATION

STORING INDEPENDENT TRANSMIT FREQUENCY ("ODD SPLIT")

③ Press the the [**V/M**] key to store the frequency and settings into memory.

All memories can store an independent transmit frequency, for operation on repeaters with non-standard shift.

To store the "Odd Split" transmit frequency, first store the receive frequency using the
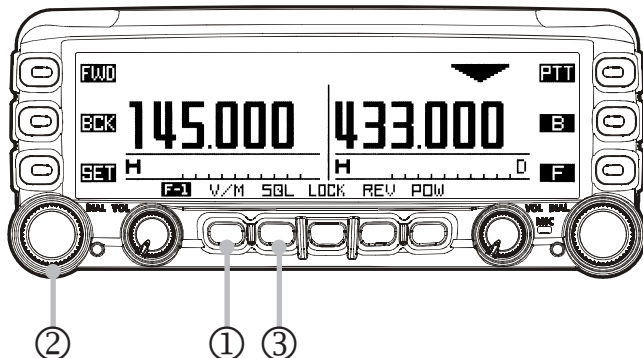
method already described on the previous page. Then follow the below procedures:

① Tune the desired transmit frequncy on the "Main" band, then press and hold in the [**V/M**] key for two seconds.
② Rotate the *left side* [**DIAL**] knob to select the same memory channel number as used in step 1 above.
③ Press the [**TXIN**] key to store the independent transmit frequency into memory.

MEMORY OPERATION

MEMORY RECALL
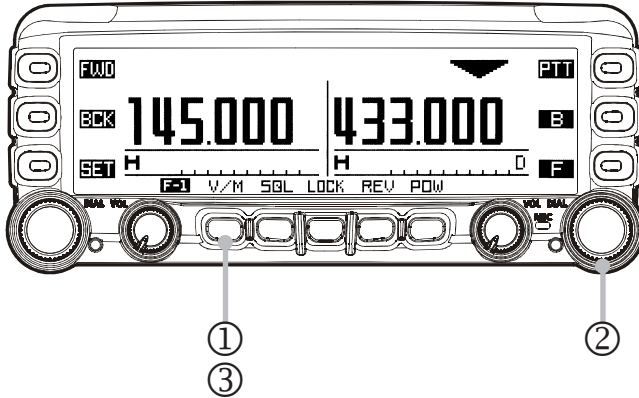
① Press the [**V/M**] key, to set the "Main" band to the memory mode.
② Rotate the [**DIAL**] knob to select the desired memory channel.
③ To return to the VFO mode, press the [**V/M**] key.

❒ When the radio in the memory mode, you may recall the memories to the "Main" band by entering the memory number useing the microphone keypad.
  For example, to recall the memory channel #14, press [**0**] → [**1**] → [**4**].
❒ When an "Odd Split" memory channel is recalled, the " ⊞ " indication will appear in the display.
❒ When a "Tagged" memory channel is displayed with the Alpha/numeric "Tag", a small frequency indication will also be shown. You may change the display between "Tag" indication and "Frequency" indication via Set Mode item "**D018 MEMORY DIS-PLAY**" in the "**MEMORY**" group.

MEMORY EDIT

The memory channels may be edited using Set Mode item "**D02 MEMORY EDIIT**" in the "**MEMORY**" group.

LABELING MEMORIES

1. Rotate the *left side* [**DIAL**] knob to select a memory channel to append or change the label.
2. Press the [**V/M**] key for two seconds, and then add or change the label in the same manner as step ② of the "Memory Storage" procedure (see page 6).

COPYING MEMORIES

1. Rotate the *left side* [**DIAL**] knob to select the memory channel to be copied.
2. Press the [**SEL**] key. The selected column will blink.
3. Rotate the *left side* [**DIAL**] knob to select a memory channel to store the data.
4. Press the [**CPY**] key to copy the memory channel data.
5. Press the [**SEL**] key to save the data and stop the column blinking.

DELETING MEMORIES

1. Rotate the *left side* [**DIAL**] knob to select the memory channel to delete.
2. Press the [**SEL**] key. The selected column will blink.
3. Press the [**DEL**] key to delete the memory channel data.

MEMORY OPERATION

MEMORY CHANNEL SORT

The memory channels may be sorted and renumbered by frequency, from low to high using the "Special Function" mode.

1. Turn the radio off.
2. To enter the "Special Function" mode, turn the radio on while press and holding the key located at the left of the [**POWER**] switch.
3. To sort the memory channels in the *left band*, rotate the *left side* [**DIAL**] knob to select function menu item "**3 L-MEMORY SORT**". To sort the memory channels in the *right band*, rotate the *left side* [**DIAL**] knob to select function menu item "**4 R-MEMORY SORT**".
4. Press the *left side* [**DIAL**] knob, to display the confirmation message "**OK?** [**SET**]" on the display. If you decide to cancel the memory channel sort, press the [**ESC**] key.
5. Press the *left side* [**DIAL**] knob again. After several seconds, sorting is complete, and the **FTM-350** will reset automatically.

AF DUAL OPERATION

The AF Dual function permits monitoring an amateur band frequency while listening to an FM broadcast station.
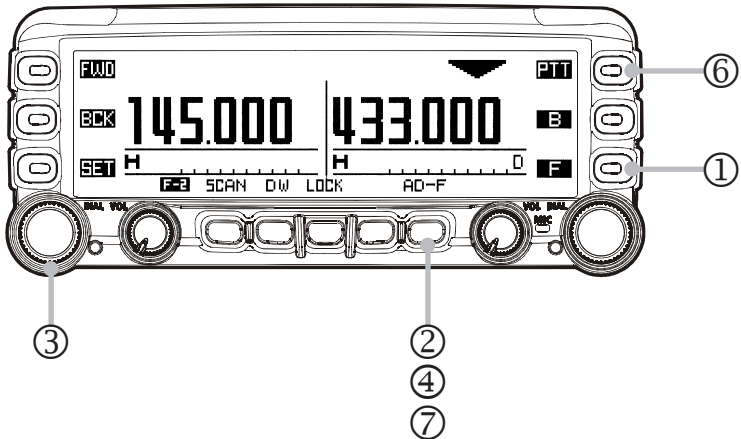
① Press the [**F**] key repeatedly, until the [**SMART FUNCTION**] keys change to the "**F-2**" mode.

② Press the [**AD-F**] key to activate the AF Dual function.
The *left side* receiver switches to FM Broadcast. The *right side* receiver will monitor the amateur frequencies, while you listen to the FM Broadcast station.

③ Rotate the *left side* [**DIAL**] knob to tune the desired FM broadcast stations.

④ To change the audio source to the AM Broadcast band, or Line-In audio, press and hold the [**AD-F**] key for two seconds to access the Set Mode. Select the desired audio source by rotating the *left side* [**DIAL**] knob, and then press the [**ESC**] key.

⑤ When a signal is received in the amateur band, the amateur band audio is output to the speaker. The FM or AM broadcast station will no longer be heard.

⑥ When the *right side* receiver is set in the amateur band by "Main" band, you may transmit on the amateur band by pressing the [**PTT**] key.

⑦ Press the [**AD-F**] key to disable the AF Dual function and return to normal operation.

Band Scope Operation

General

The Band Scope permits viewing operating activity on channels above and below the current operating channel, in the VFO mode.
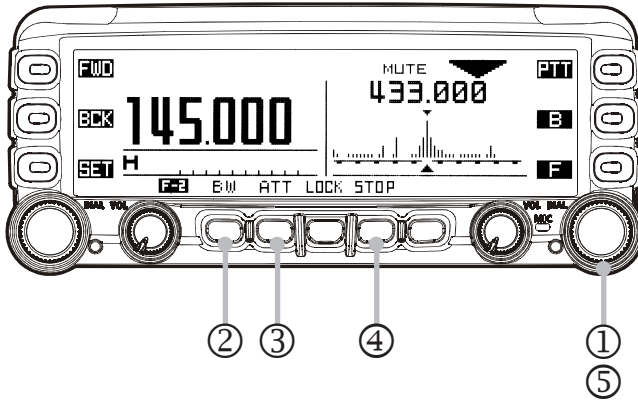
① Press the "Main" band [**DIAL**] knob to activate the Band Scope.
② Press the [**BW**] key to toggle the visible bandwidth to "±22 channels" and "±50 channels".
③ Press the [**ATT**] key to reduce the receiving signal by approximately 10 dB, if desired (except the AM and FM Broadcast bands).
④ Press the [**STOP**] key to stop the sweep of the Band Scope temporarily, if desired. Press the [**START**] key to start the sweep of the Band Scope again.
⑤ Press the "main" band [**DIAL**] knob to disable the Band Scope and return to normal operation.

BAND SCOPE OPERATION

ENHANCED MODE

When in **Mono-Band** mode, the Enhanced **Band Scope** "Special Function" features may be activated. (See "Switching to the Enhanced Mode" below).
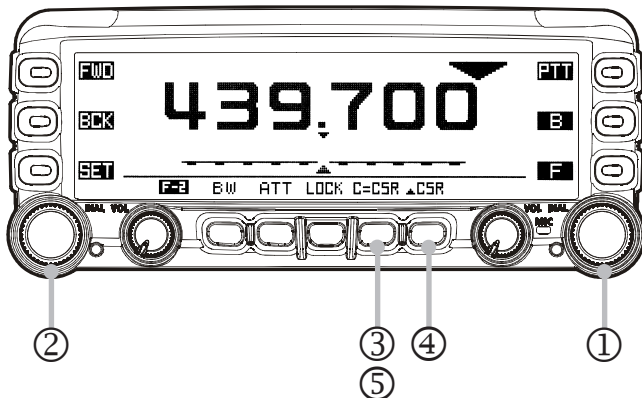
① Rotate the "Main" band [**DIAL**] knob to tune the operating frequency.
② Rotate the "Sub" band [**DIAL**] knob to move the cursor (▲).
③ Press the [**C=CSR**] key to return the cursor to band center.
④ Press the [**▲CSR**] key, to change the "▲" cursor to "△". In this case, you may tune the operating frequency by moving cursor, or by rotating the "Sub" band [**DIAL**] knob.
⑤ Press the [**C=CSR**] key to return to the current frequency, and the cursor to band center, and change the "△" cursor to "▲".

Switching to the Enhanced Mode

1. Turn the radio off.
2. Turn the radio on while holding the key, which is located left of the [**POWER**] switch, to enter the "Special Function" mode.
3. Rotate the *left side* [**DIAL**] knob to select the function menu item "**8 BAND SCOPE**".
4. Press the *left side* [**DIAL**] knob, and then rotate the *left side* [**DIAL**] knob to select "**SPECIAL**".
5. Press the *left side* [**DIAL**] knob to save the new setting.
6. Press the [**ESC**] key, the **FTM-350R** is reset automatically.

CTCSS/DCS/EPCS Operation

CTCSS Operation

1. Press and hold in the [**F**] key for two seconds to change the [**SMART FUNCTION**] key category to the "**SQL**" functions.
2. Press the [**TYPE**] key repeatedly, until the "**TONE SQL**" notation appears; this activates the CTCSS operation.
3. Press the [**T•FRQ**] key, then rotate the "Main" band's [**DIAL**] knob to select the desired CTCSS frequency.
4. Press the [**ESC**] key to save the new setting and exit to normal operation.
5. To end the CTCSS operation, press the [**TYPE**] key repeatedly, until the "**OFF**" notation appears.

You may customize the CTCSS operation so that a ringing "bell" sound alerts you when a call is coming in. Use Set Mode item "**J01 BELL RINGER**" in the "**SIGNALING**" group.

DCS Operation

1. Press and hold in the [**F**] key for two seconds to change the [**SMART FUNCTION**] key category to the "**SQL**" functions.
2. Press the [**TYPE**] key repeatedly, until the "**DCS**" notation appears; this activates the DCS operation.
3. Press the [**D•COD**] key, then rotate the "Main" band's [**DIAL**] knob to select the desired DCS code.
4. Press the [**ESC**] key to save the new setting and exit to normal operation.
5. To end the DCS operation, press the [**TYPE**] key repeatedly, until the "**OFF**" notation appears.

You may customize the DCS operation so that a ringing "bell" sound alerts you when a call is coming in. Use Set Mode item "**J01 BELL RINGER**" in the "**SIGNALING**" group.

CTCSS/DCS/EPCS OPERATION

EPCS OPERATION

The EPCS (Enhanced Paging & Code Squelch) feature allows addressing calls to a specific station (Paging), and choosing to receive only the calls directed to your station (Code Squelch).

The EPCS feature use two pairs of (alternately switched) CTCSS tones, which are stored in the pager memories. The receiver remains silent until it receives the CTCSS tone pair that matches those stored in the receiving pager memory.

1. Store the CTCSS tone pairs using Set Mode item "**J04 PAGER CODE**" in the "**SIGNALING**" group. The Sub menus "**1: RX**" and "**2: RX**" set the receiving tone codes, and Sub menus "**3: TX**" and "**4:TX**" set the transmit tone codes.
2. Press and hold in the [**F**] key for two seconds to change the [**SMART FUNCTION**] key category to the "**SQL**" functions.
3. Press the [**TYPE**] key repeatedly, until the "**PAGER**" notation appears; this activates the EPCS feature.
4. To end the EPCS operation, press the [**TYPE**] key repeatedly, until the "**OFF**" notation appears.

You may customize the EPCS operation so that a ringing "bell" sound alerts you when a EPCS call is received. Use Set Mode item "**J01 BELL RINGER**" in the "**SIGNALING**" group.

SCAN OPERATION

VFO SCAN

1. Press the [**F**] key repeatedly until the [**SMART FUNCTION**] keys "**F-1**" category is displayed. Then, if necessary, set the "Main" band to VFO mode by pressing the [**V/M**] key on the "**F-1**" category.
2. Press the [**F**] key briefly to change the [**SMART FUNCTION**] keys to the "**F-2**" category.
3. Press the [**SCAN**] key on the "**F-2**" category to initiate the VFO scan.
4. Press the [**SCAN**] key again to stop the VFO scan.

You may customize the functions of the VFO Scan using the following Set Mode items: "**F02 SCAN DIRECTION**", "**F03 SCAN RESUME**", "**F04 SCAN STOP BEEP**" in the "**SCAN**" group and "**G08 RX COVERAGE**" in the "**SYSTEM**" group.

MEMORY SCAN

1. Press the [**F**] key repeatedly until the [**SMART FUNCTION**] keys change to the "**F-1**" category, Then, if necessary, set the "Main" band to memory mode by pressing the [**V/M**] key.
2. Press the [**F**] key briefly to change the [**SMART FUNCTION**] key category to "**F-2**".
3. Press the [**SCAN**] key on the "**F-2**" category to initiate the memory scan.
4. Press the [**SCAN**] key again to stop the memory scan.

You may customize the functions of the Memory Scan using Set Mode items "**D03 MEMORY SCAN TYPE**" in the "**MEMORY**" group, "**D04 MEMORY SKIP/SELCT**", "**F03 SCAN RESUME**", "**F04 SCAN STOP BEEP**" in the "**SCAN**" group, and "**G08 RX COVERAGE**" in the "**SYSTEM**" group.

SCAN OPERATION

PROGRAMMABLE MEMORY SCAN (PMS)

This feature allows scanning with sub-band limits.

1. Store the lower sub-band limit into the memory channel "P1L".
2. Store the upper sub-band limit into the memory channel "P1U".
3. Set the "Main" band to memory mode, if necessary, by pressing the [**V/M**] key on the "**F-1**" category.
4. Recall memory channel "P1L" or "P1U".
5. Press the [**F**] key briefly to change the [**SMART FUNCTION**] keys to the "**F-2**" category.
6. Press the [**SCAN**] key on the "**F-2**" category to initiate the scanning within the programmed range.
7. Press the [**SCAN**] key again to stop the scanner.
8. Press the [**V/M**] key on the "**F-1**" category to change between the memory mode and the VFO mode.
9. Nine pairs of band limit memories, labeled "P1L/P1U" through "P9L/P9U" are available. Upper and lower operation limits may be set on a number of bands.

You may customize the functions of the Memory Scan via Set Mode items "**D03 MEMORY SCAN TYPE**" in the "**MEMORY**" group, "**D04 MEMORY SKIP/SELCT**", "**F03 SCAN RESUME**", "**F04 SCAN STOP BEEP**" in the "**SCAN**" group, and "**G08 RX COVERAGE**" in the "**SYSTEM**" group.

PRIORITY CHANNEL SCAN (DUAL WATCH)

This feature is a two-channel scanning function, which allows operation on a VFO or Memory channel, while periodically checking the "Priority" memory channel "000" for activity.

1. Store the frequency which you wish to check periodic into the "Priority" memory channel "000".
2. Press the [**F**] key repeatedly until the [**SMART FUNCTION**] keys change to the "**F-2**" category.
3. Press the [**DW**] key in the "**F-2**" category to initiate the Dual Watch feature.
   A "**P**" icon will appear on the display when Dual Watch is activated.
4. Press the [**DW**] key again to stop the Dual Watch feature.

You may customize the functions of the Dual Watch feature via Set Mode items "**F01 DUAL WATCH STOP**" and "**F03 SCAN RESUME**" in the "**SCAN**" group.

BLUETOOTH® OPERATION

When the optional **BU-1 *Bluetooth*®** Unit is installed, the **FTM-350R** can use wireless links to send/receive voice message with the optional **BH-1A** or **BH-2A *Bluetooth*®** Headset.

PAIRING

1. Turn both the radio and *Bluetooth*® Headset off.
2. To enter the "Special Function" mode, turn the radio on while press and holding the key located at the left of the [**POWER**] switch.
3. Rotate the *left side* [**DIAL**] knob to select the function menu item "**9 B-T PAIRING**".
4. Press the *left side* [**DIAL**] knob.
5. Press and hold the power switch on the *Bluetooth*® Headset for five seconds, until the *Bluetooth*® Headset indicator blinks red/blue alternately.
6. Press the *left side* [**DIAL**] knob to initiate the pairing.
7. If the pairing is successful (requires 20 to 30 seconds), the "**PAIRING OK !**" notation will appear on the display. The **FTM-350R** will turn off and back on again.
   When the *Bluetooth*® Headset is correctly recognized by the **FTM-350**, the *Bluetooth*® Headset's indicator will blink blue.
8. Set up the various functions of the *Bluetooth*® via Set Mode items "**K01 BLUETOOTH**".

OPERATION

1. When the *Bluetooth®* Headset is correctly recognized by the **FTM-350R**, "⁑" icon will appear on the **FTM-350R** display, and the LED indicator on the *Bluetooth®* Headset will blink blue.

2. Adjust the receiver audio level using the [**VOLUME**(+)]/[**VOLUME**(−)] switches on the *Bluetooth®* Headset.

3. Press the **PTT** switch on the *Bluetooth®* Headset to transmit. Release the **PTT** switch to return to receive.

4. If the **BH-2A** *Bluetooth®* Headset is used, the microphone gain may be adjusted in five steps, by pressing the [**VOLUME**(+)] or [**VOLUME**(−)] switch while holding the **PTT** switch.

5. The communication range between the *Bluetooth®* Headset and **FTM-350** is around 1 m (3 ft). If you move out of range, a beep will be heard from the *Bluetooth®* Headset to alert you. If you move back into range, the *Bluetooth®* Headset will beep to alert you that you are back within range.

6. When the battery voltage of the *Bluetooth®* Headset is low;
    a. the LED on the *Bluetooth®* Headset will blink Red and Blue.
    b. a beep will be heard from the *Bluetooth®* Headset.
    c. the "⁑" icon on the **FTM-350R** will be blinking fast.
    Charge the battery of the *Bluetooth®* Headset.

In the **FTM-350R** factory default setting, the internal and external speakers, the front panel microphone, and front panel MIC jack are all disabled when the *Bluetooth®* Headset is correctly recognized. However, the microphone connected to the transceiver's **MIC** jack is still alive.

You may customize the *Bluetooth®* operation via Set Mode items "**K01 BLUETOOTH**" in the "**OPTION**" group. See page 44.

INTERNET CONNECTION FEATURE

The **FTM-350R** can be used to access a "node" (repeater or base station), which is tied into the Vertex Standard WiRES™ (Wide-Coverage Internet Repeater Enhancement System) network, operating in the "SRG" (Sister Radio Group) mode. Details may be found at the WiRES-II Web site: http://www.vxstd.com/en/wiresinfo-en/.

To begin using the Internet Connection feature, first change the [**AD-F**] key function to the [**WiRES**] keyfunction using the following procedure:

1. Press the [**F**] key repeatedly until the [**SMART FUNCTION**] keys change to the "**F-2**" category.
2. Press and hold the [**AD-F**] key for two seconds to access the Set Mode, then select the "WiRES" item by rotating the *left side* [**DIAL**] knob.
3. Press the [**ESC**] key to exit from the Set Mode.

SRG ("SISTER RADIO GROUP") MODE

1. Press the [**SET**] key to enter the Set Mode, choose the "**SIGNALING**" group, choose the "**J06 WiRES**" item, and then choose "SRG". See page 43.
2. Press the [**ESC**] key three times, to exit from the Set Mode, and activate the Internet Connection feature in the "**SRG**" mode. The "⬚" icon will appear on the display.
3. Press the [**WiRES**] key to access the Set Mode. Rotate the *left side* [**DIAL**] knob to select the access number ("**CODE 0**" ~ "**CODE #**") corresponding to the WiRES™ repeater, then press the [**ESC**] key to exit from the Set Mode.
4. With the Internet Connection feature activated, the **FTM-350R** will generate a brief (0.1 sec) DTMF tone according to your selection in step 3. This DTMF tone is sent at the beginning of every transmission to establish or maintain the link to the remote WIRES™ repeater operating in the "SRG" mode.
5. To disable the Internet Connection feature, select the "**OFF**" selection in the Set Mode item "**J06 WiRES**".

INTERNET CONNECTION FEATURE
FRG ("FRIENDLY RADIO GROUP") MODE

1. Press the [**SET**] key to enter the Set Mode, choose the "**SIGNALING**" group, choose the "**J02 DTMF MEMORY**" item, and then choose "**FRG**". Store the access code of the Internet link to the DTMF memory register. See page 42.
2. Then set item "**J06 WiRES**" in the "**SIGNALING**" group to "**FRG**". See page 43.
3. Press the [**ESC**] key three times to exit from the Set Mode and activate the Internet Connection feature in the "**FRG**" mode. The "▦" icon will appear on the display.
4. To access an FRG node, perform the following procedures:
   1) Press the [**WiRES**] key to access the Set Mode.
   2) Rotate the *left side* [**DIAL**] knob to select the WiRES memory register corresponding to the WiRES™ repeater you wish to establish an internet link with.
   3) Press the [**ESC**] key to exit from the Set Mode.
   4) Press the [▦] key (located at the left edge of the [**SMART FUNCTION**] key while transmitting) while pressing the **PTT** switch to transmit the access code.
5. To disable the Internet Connection feature, select the "**OFF**" selection in the Set Mode item "**J06 WiRES**".

DTMF OPERATION

MANUAL DTMF TONE GENERATION

1. Press the microphone **PTT** switch to begin transmission.
2. While transmitting, press the desired number keys on the microphone.
3. When you have sent all the digits desired, release the **PTT** switch.

DTMF AUTODIALER

1. To store a telephone number to a DTMF memory register, press the [**SET**] key and choose the "**SIGNALING**" group, then choose item "**J02 DTMF MEMORY**". Choose a DTMF register and enter the telephone number. See page 40.
2. Then Set Mode item "**J03 DTMF MODE**" in the "**SIGNALING**" group to "**ON**". See page 42.
3. Press the [**ESC**] key three times, to exit from the Set Mode, and activate the DTMF Autodialer.
4. To send the telephone number, perform the following procedure while pressing the **PTT** switch:
    1) Press the [**DTMF**] key (located at the left side of the [**POWER**] key while transmitting).
    2) Rotate the [**DIAL**] knob to select the DTMF memory register corresponding to the telephone number you wish to send.
    3) Press the [**DTMF**] key again to transmit the telephone number.
5. To disable the DTMF Autodialer, select the "**OFF**" selection in the Set Mode item "**J06 DTMF MODE**".

You may send the telephone number by pressing the microphone numeric keys ([**1**] through [**9**]) corresponding to the DTMF memory string you wish to send.

BARO/ALTI PAGE OPERATION

The **FTM-350R** can display the current Barometric Pressure and relative changes in the pressure. Furthermore, when an optional **FGPS-1** or **FGPS-2**※ GPS Unit isn installed, the **FTM-350R** can display the current altitude and relative changes in the altitude.

First, enable the "BARO/ALTI" page, by pressing the [**SET**] key and choosing the "**DIS-PLAY**" group. Then select the Set Mode item "**C01 DISPLAY SELECT**" and set the "BARO/ALTI" page to ON. Press the [**ESC**] key three times to exit the Set Mode. See page 35.

To display the "Baro/Alti" Page, enablesthe "BARO/ALTI" page via Set Mode item "**C01 DISPLAY SELECT**" in the group, beforehand. See page 35.
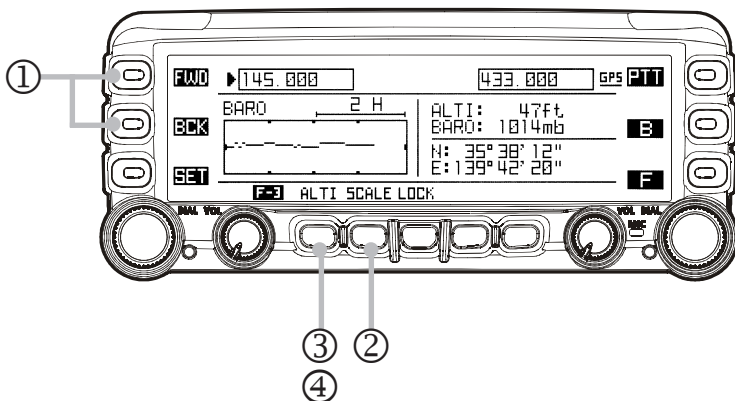
① Press the [**FWD**] or [**BCK**] key repeatedly, until the "BARO/ALTI" Page appears.
The current Barometric Pressure appears at the upper right of the display. A chart that and indicates the relative changes in the pressure (barometric chart) is presented in the left half of the display.
Additionally, if you install the optional GPS Unit, your current altitude appears at the upper right of the display, and your current position (Longitude/Latitude) appears at the lower right of the display.

② Press the [**SCALE**] key to change the time scale of the barometric chart. Available selections are "2H", "6H", "12H", and "24H".

③ Press the [**ALTI**] key to change the "barometric" chart to the "altitude" chart. You may also change the time scale of the altitude chart by pressing the [**SCALE**] key.

④ To return to the "barometric" chart, press the [**BARO**] key.

To return to the "Radio" page, press the [**FWD**] or [**BCK**] key repeatedly, until the "Radio" Page appears.

You may change the measurement units of the barometric and altitude, via Set Mode item "**G10 UNIT SELECT**" in the "**SYSTEM**" group (see page 39).

※: The **FGPS-2** GPS Unit requires **CT-133** GPS Antenna Cable and **CT-136** GPS Antenna Adapter.

GPS OPERATION (REQUIRES OPTIONAL GPS ANTENNA UNIT)

When the optional **FGPS-1** or **FGPS-2**✳ GPS Antenna Unit is installed, the **FTM-350R** permits the display of your position (Longitude/Latitude).

Before beginning GPS operation, enable the "GPS" page via the Set Mode item "**C01 DISPLAY SELECT**" in the "**DISPLAY**" group. See page 35.
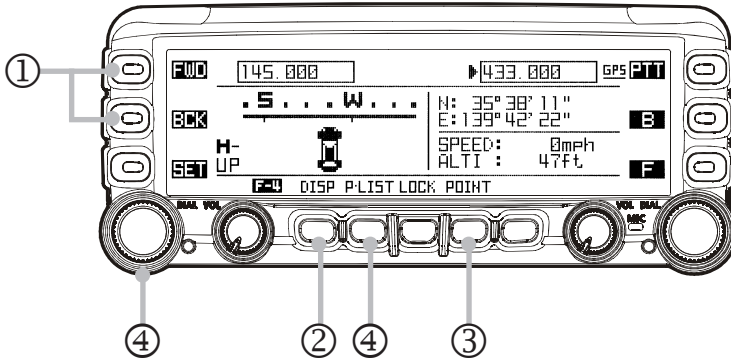
① Press the [**FWD**] or [**BCK**] key repeatedly, until the "GPS" Page appears.
   Your current position (Longitude/Latitude) appears at the upper right of the display, and your current altitude and vehicle speed appears at the lower right of the display. Additionally, your course direction (compass) displays in the left half of the display.
② Press the [**DISP**] key to change the compass. Available selections are "Compass Rose (North Up)", "Compass Rose (Heading Up)", and "Compass Tape".
③ Press the [**POINT**] key to store the current position and date into the "Point" memory, if desired. Available "Point" memories are in four groups, and there are four Channels for each group.
④ Press the [**P•LIST**] key to open the "Point" memory list. Rotate the *left side* [**DIAL**] knob to scroll the list and press the [**BCK**] key to close the list. You may delete the desired point from the "Point" memory list by pressing the [**DEL**] key, if desired.

To return to the "Radio" page, press the [**FWD**] or [**BCK**] key repeatedly, until the "Radio" Page appears.

You may change the measurement units of the altitude and vehicle speed via Set Mode item "**G10 UNIT SELECT**" in the "**SYSTEM**" group (see page 39), and also change the time format via Set Mode item "**I02 DATE&TIME FORMAT**" in the "**TIMER/CLOCK**" group (see page 41).

✳: The **FGPS-2** GPS Antenna Unit requires **CT-133** GPS Antenna Cable and **CT-136** GPS Antenna Adapter.

"Point" memory

The **FTM-350R** has 16 "point" memories (four channels in each of four groups), which store the positon (Longitude/Latitude) and the date.

When your vehicle nears one of the "Point" memories, the "Nav" pop-up window will open for ten seconds even if another page is being displayed.

You may customize the length of time the window opens via Set mode item "**H03 NAVI POPUP**" in the "**NAVI**" group. In addition, the "date" may be changed to a place or name, using the following procedure:

1. Press the [**P•LIST**] key to open the "Point" memory list.
2. Rotate the *left side* [**DIAL**] knob to select the "Point" memory "date" to be changed.
3. Press the *left side* [**DIAL**] knob to show the detail data of the "Point" memory.
4. Press the *left side* [**DIAL**] knob again to enable editing of the stored data.
5. Rotate the *left side* [**DIAL**] knob to toggle the point alarm function ON/OFF. When this selection is set to "OFF", the "Nav" pop-up window does not open even if your vehicle nears that "Point" memory location.
6. Press the [→] key to move the cursor to the "date" area, and then press the [**CLR**] key to clear previous data.
7. To enter the desired name, rotate the *left side* [**DIAL**] knob to select a character/number, and press the [←] or [→] key to move the cursor.
8. Press the [**ENT**] key to overwrite the date setting.
9. Press the [**BCK**] key to return to the "GPS" page, and then press the [**NAVI**] key again to initiate navigation.
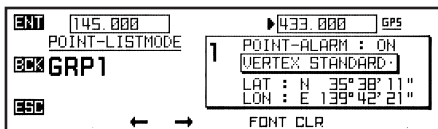
Important Note

When the GPS Antenna Unit is first turned on, it may take several minutes to complete a fix of your position. This is normal, as the GPS unit is downloding "almanac" information from the GPS satellites.

NAVI OPERATION (REQUIRES OPTIONAL GPS ANTENNA UNIT)

The **FTM-350R** enables navigating to any destination previously entered into the "Point" memory.

Before beginning Navigation, the "NAVI" page must be enabled via Set Mode item "**C01 DISPLAY SELECT**" in the "**DISPLAY**" group. See page 35.

① Press the [**FWD**] or [**BCK**] key repeatedly, until the "NAVI" Page appears.
② Press the [**P•LIST**] key to open the "Point" memory list, then rotate the *left side* [**DIAL**] knob to select the desired destination.
③ Press the [**NAVI**] key to return to the "NAVI" Page. The destination appears at the upper right of the display, and the distance between your current position and destination appears at the lower right of the display. Additionally, your course direction (compass) is shown in the left half of the display.
④ Press the [**NAVI**] key to initiate navigation. Drive your vehicle so that the "CAR" icon turns to a "**D**" symbol in the Compass display.
⑤ If desired, while navigating, the current position and date may be stored into the "Point" memory by pressing the [**POINT**] key. Four groups of "Point" memories are available with four channels for each group.

When your vehicle nears the destination, emits the alarm beep and the "**GOAL!**" notation appears in the Compass display.

To return to the "Radio" page, press the [**FWD**] or [**BCK**] key repeatedly, until the "Radio" Page appears.

You may customize the NAVI operation via the "**NAVI**" group of the Set Mode (see page 40).

NAVI OPERATION (Requires Optional GPS Antenna Unit)

To Navigate to the New Point

To navigate to a place that has not been previously stored in the "Point" memory, determine the longitude/latitude of that place from the map, then overwrite that data into one of the previously stored "Point" memories.

1. Press the [**P•LIST**] key to open the "Point" memory list.
2. Rotate the *left side* [**DIAL**] knob to select the "Point" memory you wish to overwrite.
3. Press the *left side* [**DIAL**] knob to show the detail data of the "Point" memory.
4. Press the *left side* [**DIAL**] knob again to enable editing of the stored data.
5. Enter the new point by turning the *left side* [**DIAL**] knob to select the character/number, and press the [←] or [→] key to move the cursor.
6. Press the [**ENT**] key to overwrite the setting.
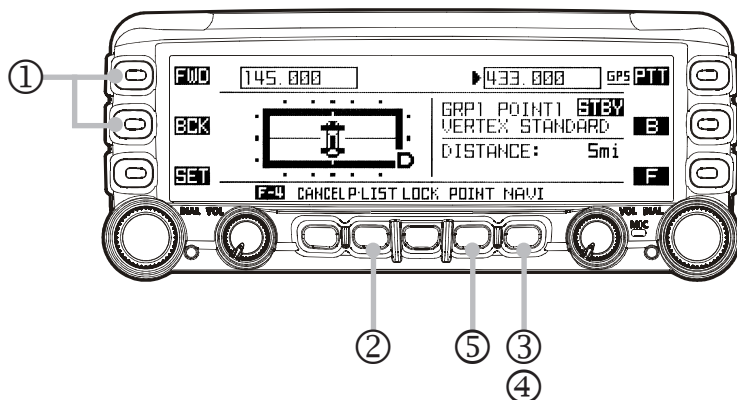7. Press the [**NAVI**] key to return to the "NAVI" Page, then press the [**NAVI**] key again to initiate navigation.

Audio Playback Operation (Requires Optional Voice Guide Unit)

The **FTM-350R** can record an incoming signal. The recording mode has two types; (a) automatic recording of the last 30 seconds of incoming signal ("Last" mode), or (b) eight recording memories of variable length ("Free" mode; capable of storing up to five minutes of total recording time).

Before beginning the Audio Playback Operation, set each parameter of the Voice Guide Unit, via Set Mode item "**K03 VOICE**" in the "**OPTION**" group. See page 45.
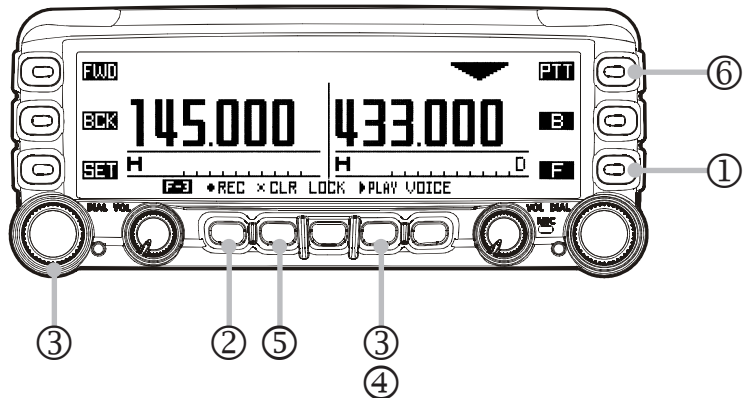
① Press the [**F**] key repeatedly until the [**SMART FUNCTION**] key changes to the "**F-3**" category (or "**F-4**": when the APRS function is activated).

② Press the [●**REC**] key to initiate recording.

③ Press the [■**STOP**] key to terminate the recording process.

④ To play back the recorded data:
  "Last" mode: press the [▶**PLAY**] key. The last 30 seconds of the recorded audio will be heard from the speaker.
  "Free" mode: press and hold the [▶**PLAY**] key repeatedly, until the "recording slot" you wish to hear appears, then press the [▶**PLAY**] key briefly. You will hear the recorded audio.

⑤ Press the [✕**CLR**] key to clear all the recorded audio, if desired.

NOTE

MISCELLANEOUS SETTING (SET MODE OPERATION)

The **FTM-350R** has 87 items in the Set Mode, and they are arranged in 8groups (A-K). It is convenient to initially select the group by rotating the *left side* [**DIAL**] knob. Then briefly press the *left side* [**DIAL**] knob and rotate it again to select the desired operating item. When you have finished making your adjustment, press the [**ESC**] key repeatedly, until the **FTM-350R** returns to normal operation.

The groups are as follows.

MISCELLANEOUS SETTING (SET MODE OPERATION)

AUDIO GROUP

A01: AF DIFFERENTIAL

Function: Enables/Disables the AVC (Automatic Audio Volume Controller).

The AVC allows the most comfortable and/or effective reception in noisy environment.

Available Values: OFF, MIN, MID, or MAX

Default: OFF

OFF: Disables the AVC.

MIN: Activates the AVC with the low effect level.

MID: Activates the AVC with the medium effect level.

MAX: Activates the AVC with the high effect level.

A02: AF TONE CONTROL

Function: Selects the tone pitch of the received audio.

Available Values: LOW-3, LOW-2, LOW-1, NORMAL, HIGH-1, or HIGH-2

Default: NORMAL

LOW-3:   The received audio is enhanced in the low frequency range with a high level effect.

LOW-2:   The received audio is enhanced in the low frequency range with a medium level efect.

LOW-1:   The received audio is enhanced in the low frequency range with a low level efect.

NORMAL: The received audio does not pass through the tone pitch control.

HIGH-1:   The received audio is enhanced in the high frequency range with a low level effect.

HIGH-2:   The received audio is enhanced in the high frequency range with a high level effect.

A03: SPEAKER

Function: Selects the speaker to be used:

Available Values: FRONT+REAR, FRONT, OFF, or REAR

Default: FRONT+REAR

FRONT+REAR: Receiver audio is routed through the FRONT (located in the front panel) and REAR (located in the transceiver body) speakers.

FRONT: Output the receiving audio from the FRONT speaker.

OFF: Disable the FRONT and REAR speakers.

REAR: Output the receiving audio from the REAR speaker.

Miscellaneous Setting (Set Mode Operation)

AUDIO Group

A04: STEREO/MONO

Function: Selects audio output mode.
Available Values: MONAURAL or STEREO
Default: MONAURAL

A05: SUB BAND MUTE

Function: Selects the operation method of the MUTE function during dual receive operation.
Available Values: OFF, TX MUTE, RX MUTE, or TRX MUTE
Default: OFF

OFF: Disable the MUTE function.
TX MUTE: Disables the sub band's receiver audio output while transmitting on the main band.
RX MUTE: Disables the sub band's receiver audio output when receive the signal on the main band.
TRX MUTE: Disables the sub band's receiver audio output while transmit on the main band, and when receive the signal on the main band.

Miscellaneous Setting (Set Mode Operation)

TX/RX Group

B01: MIC GAIN
Function: Adjust the microphone gain level.
Available Values: MIN, LOW, NORMAL, HIGH, or MAX
Default: NORMAL

B02: PTT MODE
Function: Selects the front panel's PTT key function.
Available Values: MOMENTARY / TOGGLE
Default: MOMENTARY

B03: RPT SHIFT DIREC
Function: Sets the repeater shift direction.
Available Values: SHIFT OFF, SHIFT–, or SHIFT+
Default: OFF

B04: RPT SHIFT FREQ
Function: Sets the magnitude of the repeater shift.
Available Values: 0.00 - 99.95 MHz (50 kHz/step)
Default: Depends on the operating band.

B05: RX EXPANSION
Function: Enables/Disables band expansion.
Available Values: GENERAL or WIDE COVERAGE
Default: GENERAL
When this Set Mode item is set to "WIDE COVERAGE", you will receive the 108 - 137 MHz and 480 - 999.9875 MHz bands (Cellular blocked).

B06: VOX
Function: Enables/Disables VOX operation.
Available Values: OFF, REAR HAND-MIC, FRONT HAND-MIC, or INTERNAL MIC
Default: OFF

OFF: Disable VOX operation.
REAR HAND-MIC: Enable VOX operation for the microphone which is connected to the rear panel MIC jack (located in the transceiver's body).
FRONT HAND-MIC: Enable VOX operation for the microphone which is connected to the front panel MIC jack (located in the control head).
INTERNAL MIC: Enable VOX operation for the microphone which is connected to the front panel microphone.

MISCELLANEOUS SETTING (SET MODE OPERATION)

TX/RX GROUP

B07: VOX SENSITIVITY

Function: Sets the VOX sensitivity.
Available Values: MIN, LOW, NORMAL, HIGH, or MAX
Default: NORMAL

B08: WIDE / NARROW AUTO

Function: Selects the receiving mode.
Available Values: AUTO, WIDE FM, FM, NARROW FM, or AM
Default: AUTO

B09: WX ALERT

Function:Enables/Disables the weather alert scan feature.
Available Values: ON or OFF
Default: OFF

MISCELLANEOUS SETTING (SET MODE OPERATION)

DISPLAY GROUP

C01: DISPLAY SELECT

Function: Enables/Disables the operating function pages recalled with the [**FWD**]/[**BCK**] key.

Available Values: FREQUENCY: ON or OFF,
TIMER/CLOCK: ON or OFF,
BARO/ALTI: ON or OFF,
GPS: ON or OFF,
NAVI: ON or OFF,
GPS INFO※: ON or OFF

Default: FREQUENCY: ON,
TIMER/CLOCK: ON,
BARO/ALTI: OFF,
GPS: ON,
NAVI: OFF,
GPS INFO※: OFF

※: Requires optional GPS Antenna Unit

C02: LCD BRIGHTNESS

Function: Sets the displays illumination level.
Available Values: MIN, 2, 3, 4, 5, 6, 7, or MAX
Default: MAX

C03: LCD COLOR

Function: Selects the displays backlight color.
Available Values: WHITE-BLUE, SKY-BLUE, MARINE-BLUE, GREEN, YELLOW-GREEN, ORANGE, UMBER or WHITE
Default: SKY-BLUE

C04: LCD CONTRAST

Function: Sets the display's contrast level.
Available Values: MIN, 2, 3, 4, 5, 6, 7, or MAX
Default: 4

MISCELLANEOUS SETTING (SET MODE OPERATION)

MEMORY GROUP

D01: MEMORY DISPLAY

Function: Selects the memory channel indication between the "Frequency" and the channel's "Alpha-numeric Tag".

Available Values: FREQUENCY or ALPHA

Default: FREQUENCY

D02: MEMORY EDIT

Function: Access to the memory edit window.

D03: MEMORY SCAN TYPE

Function: Selects what action will be performed on a "flagged" memory channel.

Available Values: ALL MEMORY or SELECT MEMORY

Default: ALL MEMORY

ALL MEMORY: The scanner will "skip" the flagged (SKIP) channels during scanning.

SELECT MEMORY: The scanner will "only scan" the flagged (SELECT) channels during scanning.

D04: MEMORY SKIP / SELCT

Function: Selects the "scan flag" to the current memory channel.

Available Values: OFF, SKIP, or SELECT

Default: OFF

OFF: All memory channels will be scanned

SKIP: The current memory channel is set to scan "SKIP" channel.

SELECT: The current memory channel is set to scan "SELECT" channel.

MISCELLANEOUS SETTING (SET MODE OPERATION)

SCAN GROUP

F01: DUAL WATCH STOP

Function: Selects the Dual Watch resume mode.

Available Values: AUTO or HOLD

Default: AUTO

AUTO: The Dual Watch feature will stop when a signal is received on the priority channel. When the signal drops, the Dual Watch will resume.

HOLD: The Dual Watch feature will stop when a signal is received on the priority channel. It will not restart automatically.

F02: SCAN DIRECTION

Function: Select the scan start direction while initiating the scanner using the scan command by pressing the [**SCAN**] key.

Available Values: UP START or DOWN START

Default: UP START

F03: SCAN RESUME

Function: Selects the scan resume mode.

Available Values: BUSY, HOLD, TIME 1 sec, TIME 3 sec, or TIME 5 sec

Default: TIME 5 sec

BUSY: The scanner will hold on a signal it encounters. When the signal drops, the scanner will resume.

HOLD: The scanner will hold on a signal it encounters. It will not restart automatically.

TIME 1 sec: The scanner will hold on a signal it encounters, and scanner will resume after one second.

TIME 3 sec: The scanner will hold on a signal it encounters, and scanner will resume after three seconds.

TIME 5 sec: The scanner will hold on a signal it encounters, and scanner will resume after five seconds.

F04: SCAN STOP BEEP

Function: Enables/Disables the scan stop beep.

Available Values: ON or OFF

Default: OFF

MISCELLANEOUS SETTING (SET MODE OPERATION)

SYSTEM GROUP

G01: APO
Function: Sets the Automatic Power-Off time.
Available Values: OFF, 0.5 hour, 1.0 hour, 1.5 hour, 2.0 hour ~ 12.0 hour (1.0 hour/step)
Default: OFF

G02: ARS
Function: Enables/Disables the Automatic Repeater Shift function.
Available Values: ON or OFF
Default: ON

G03: AUTO STEP
Function: Selects the DIAL frequency step.
Available Values: AUTO, 5.00 kHz, 6.25 kHz, 8.33 kHz, 9.00 kHz, 10.00 kHz, 12.50 kHz, 15.00 kHz, 20.00 kHz, 25.00 kHz, 50.00 kHz, 100.00 kHz, or 200.00 kHz
Default: AUTO

G04: BEEP
Function: Adjusts the beep volume level.
Available Values: OFF, LOW, or HIGH
Default: LOW

G05: F KEY
Function: Selects the function of the front panel "**F-2**" key that is located at the right-side end of the "**F-2**" category [**SMART FUNCTION**] keys.
Available Values: MHz, AF DUAL 1 (LINE-IN), AF DUAL 2 (AM), AF DUAL 3 (FM), PA, SQL OFF, T-CALL, or WiRES
Default: AF DUAL 3 (FM)

G06: MIC P KEY
Function: Selects the function of the microphone's [**P1**]/[**P2**]/[**P3**]/[**P4**] programmable keys.
Available Values: BAND SCOPE, SCAN, SQL TYPE, DCS CODE, TONE FREQ, RPT SHIFT, REVERSE, TX POWER, SQL OFF, T-CALL, WiRES, VOICE, PR FREQ, or WX
Default: P1: SQL OFF, P2: SQL TYPE, P3: PRI SHIFT, P4: TX POWER

MISCELLANEOUS SETTING (SET MODE OPERATION)

SYSTEM GROUP

G07: OPERATION MODE

Function: Shifting of CPU clock frequency.

Available Values: A or B

Default: A

This Set Mode item is only used to move a spurious response "birdie", should it fall on a desired frequency.

G08: RX COVERAGE

Function: Enables or disables band limiting for the VFO frequency selection and memory channel recalling.

Available Values: VFO: IN BAND or ALL, MEMORY: IN BAND or ALL

Default: VFO: IN BAND, MEMORY: ALL

VFO IN BAND:	When the VFO frequency reaches the high band edge of the current band, the VFO frequency will jump to the low band edge of the current band (or vice versa).
VFO ALL:	When the VFO frequency reaches the high band edge of the current band, the VFO frequency will jump to the low band edge of the next band (or vice versa).
MEMORY IN BAND:	Recalls only the memory channels, which are store in the same band as the current memory channel.
MEMORY ALL:	Recalls all memory channels regardless of the band.

G09: TOT

Function: Sets the TOT time. When your transmission time reaches the selected time, the transceiver returns to the RX mode automatically.

Available Values: OFF, 5 min, 10 min, 15min, 20 min, or 30 min

Default: OFF

G10: UNIT SELECT

Function: Selects the measurement units of the environment sensor.

Available Values: METER or YARD-POUND

Default: YARD-POUND

Miscellaneous Setting (Set Mode Operation)

NAVI Group

H01: ALARM VOLUME

Function: Select the volume level of the alarm when the **FTM-350R** arrives at its destination.

Available Values: OFF, LOW, or HIGH

Default: LOW

H02: DESTINATION AREA

Function: Select the threshold range of the destination.

Available Values: 0.05 mile, 0.1 mile, 0.2 mile, 0.3 mile, 0.5 mile, 1.0 mile, or 2.0 mile

Default: 0.1 mile

H03: NAVI POPUP

Function: Selects the "NAVI" Pop-up function.

Available Values: OFF, 1 sec ~ 30 sec, or CONTINUOUS

Default: 10 sec

MISCELLANEOUS SETTING (SET MODE OPERATION)

TIMER/CLOCK GROUP

I01: DATE&TIME ADJUST

Function: Sets the clock time.

1. Press the *left side* [**DIAL**] knob to enable adjustment of this item.
2. Enter your local time using the 24-hour system. Use the [←] / [→] key to navigate to each column, then rotate the *left side* [**DIAL**] knob to select the desired numbers in each column.
3. Press the *left side* [**DIAL**] knob again to save the new setting.

I02: DATE&TIME FORMAT

Function: Selects the display format for date and time.
Available Values: DATE: yyyy/mm/dd, yyyy/dd/mm, mm/dd/yyyy, or dd/mm/yyyy
TIME: 12 hour or 24hour
Default: DATE: mm/dd/yyyy, TIME: 24hour

I03: TIME SIGNAL

Function: Enables/Disables the Timer Signal "on" and "off".
Available Values: OFF or ON
Default: OFF

I04: TIME ZONE

Function: Sets the time offset between local time and UTC.
Available Values: UTC–14:00 ~ UTC+14:00 (0.5H/step)
Default: UTC±0:00 LONDON

Miscellaneous Setting (Set Mode Operation)

SIGNALING Group

J01: BELL RINGER

Function: Enables/Disables the Bell ringer function and selects Bell ringer repetitions.

Available Values: OFF, 1 time, 3 times, 5 times, 8 times, or CONTINUOUS

Default: OFF

When this item is enabled, the **FTM-350R** emits a "bell" sound when a signal is received that contains a CTCSS tone, DCS code or CTCSS tone pair that matches the setting of the decoder.

J02: DTMF MEMORY

Function: Programs the DTMF string used in the DTMF autodialer and FRG DTMF commands for the WiRES system. There are nine memories available.

1. Rotate the *left side* [**DIAL**] knob to select the DTMF memory register (1 - 9) into which you wish to store.
2. Press the *left side* [**DIAL**] knob briefly.
3. Rotate the *left side* [**DIAL**] knob, or press one of the microphone's keypad buttons, to select the first digit of the DTMF string.
4. When you have selected the first digit of the DTMF string using the *left side* **DIAL** knob, press the [→] key to move to the next digit.
5. Repeat steps 3 and 4 to program the remainder of the DTMF string.
6. You may backspace the cursor by pressing the [←] key.
7. Press the [**CLR**] key to clear any previously stored data, if desired.
8. Press the [**ENT**] key to save the setting.

J03: DTMF MODE

Function: Enables/Disables the DTMF autodialer feature. See page 22 for details.

J04: PAGER CODE

Function: Sets the Pager Code for Enhanced CTCSS Paging & Code Squelch. See page 15 for details.

SIGNALING Group

J05: SQL EXPANSION

Function: Enables/Disables the split CTCSS/DCS coding.

Available Values: OFF or ON

Default: OFF

When this item is set to "ON", the following parameters are added to the squelch selections available when pressing the [**TYPE**] key in the SQL category buttons

DCS ENC: DCS Encoder only. "**DC**" icon will appear while operating.

TONE DCS: Encodes a CTCSS tone and decodes a DCS code.
　　　　　　 "**T-D**" icon will appear while operating.

DCS TSQL: Encodes a DCS code and decodes a CTCSS tone.
　　　　　　 "**D-T**" icon will appear while operating.

J06: WiRES

Function: Enables/Disables the Internet Connection feature (WiRES™) and its operating mode selection.

Available Values: OFF, FRG, or SRG

Default: OFF

J07: WiRES MEMORY

Function: Selects the access number (DTMF digit) for SRG operation of the Internet Connection feature (WiRES™).

Available Values: CODE 0 ~ CODE 9, CODE A ~ CODE D, CODE ＊, or CODE #

Default: CODE 1

Miscellaneous Setting (Set Mode Operation)

OPTION Group

K01   BLUETOOTH

Function: Sets up the optional **BU-1** *Bluetooth*® Unit.

Available Values: 1 AUDIO: MANUAL or AUTO

2 MODE: MONAURAL or STEREO

3 SAVE: OFF or ON

4 VOX: OFF, PTT, VOX HIGH, or VOX LOW

Default: 1 AUDIO: AUTO, 2 MODE: MONAURAL, 3 SAVE: ON, 4 VOX: PTT

AUDIO MANUAL: The **FTM-350R** internal/external speaker function follows the setting of Set Mode item "**A03 SPEAKER**" in the "**AUDIO**" group, even if the *Bluetooth*® Headset is correctly recognized

AUDIO AUTO: When the *Bluetooth*® Headset is correctly recognized, the **FTM-350R**'s internal and external speakers are disabled.

MODE MONAURAL: Outputs monaural receive audio while listening to the FM Broadcast band, if you use the **BH-2A** *Bluetooth*® Headset.

MODE STEREO: Outputs stereo receive audio while listening to the FM Broadcast band.

Note: When this mode is selected, the VOX function does not work even if the VOX function is selected in item 4 above, if you use the **BH-2A** *Bluetooth*® Headset. The TX/RX switching is performed by pressing the PTT switch.

SAVE OFF: Disable the Battery Saver in the *Bluetooth*® Headset.

SAVE ON: Activates the Battery Saver in the *Bluetooth*® Headset.

VOX OFF: Disable the TX/RX switching circuit of the *Bluetooth*® Headset.

VOX PTT: Activates the *Bluetooth*® Headset for use with the PTT circuit.

VOX VOX HIGH: Activates the *Bluetooth*® Headset with the VOX feature (VOX Gain: High).

VOX VOX LOW: Activates the *Bluetooth*® Headset with the VOX feature (VOX Gain: Low).

MISCELLANEOUS SETTING (SET MODE OPERATION)

OPTION GROUP

K02 FPR-1

Function: Sets up the optional **FPR-1** Monitor Unit.

Available Values: 1 BATT SAVE: OFF, MIN, MID, or MAX

                     2 SQL LEVEL: OFF, MIN, 2 ~ 7, or MAX

Default: 1 BATT SAVE: MIN, 2 SQL LEVEL: 2

K03 VOICE

Function: Sets up the optional **FVS-2** Voice Guide Unit.

Available Values: 1 PLAY/REC: FREE 5min or LAST 30sec

                     2 ANNOUNCE: OFF, MANUAL, or AUTO

                     3 LANGUAGE: JAPANESE or ENGLISH

                     4 VOLUME: LOW, MID, or HIGH

Default: 1 PLAY/REC: FREE 5min, 2 ANNOUNCE: AUTO, 3 LANGUAGE: ENGLISH, 4 VOLUME: MID

PLAY/REC "FREE 5min":	Records up to the eight receive audio segments, of variable length (capable of storing up to five minutes total).
PLAY/REC "LAST 30sec":	Records the last 30 seconds of incoming signal.
ANNOUNCE "OFF":	Disables the Voice Guide feature (Audio Playback feature only).
ANNOUNCE "MANUAL":	Announces the operating frequency of the "Main" band when the [**ENT**] key is pressed.
ANNOUNCE "AUTO":	Announces the operating frequency of the "Main" band when the operating band is changed.

SPECIAL FUNCTION MENU

Static electricity may occasionally cause erratic or unpredictable operation of the micropro-
cessor. If this happens, resetting of the microprocessor may restore normal operation. Note
that resetting the microprocessor will erase all memories.

1. Turn the radio "off".
2. Turn the radio on while pressing and holding the key which is located to the left of the
   [**POWER**] switch to enter the "Special Function" mode.
3. Rotate the *left side* [**DIAL**] knob to select one of the following items:

   1 CLONE RX: Uses this item for transceiver cloning. See page next for details.

   2 CLONE TX: Uses this item for transceiver cloning. See page next for details.

3 L-MEMORY SORT:	Sorts and renumbers the memory channels of the left side memory bank by frequency, from low to high. See page 10 for details.
4 R-MEMORY SORT:	Sorts and renumbers the memory channels of the right side memory bank by frequency, from low to high. See page 10 for details.
5 SYSTEM RESET:	Resets the Set Mode item settings (except "APRS/PKT" group) to their factory defaults.
6 ALL RESET:	Clears all memories and other settings to factory defaults.
7 APRS RESET:	Resets only the Set Mode item setting of the "APRS/PKT" group to their factory defaults.
8 BAND SCOPE:	Switches the Band Scope operation to the Enhanced Mode. See page 18 for details.
9 B-T PAIRING:	Set up the *Bluetooth*® device. See page 18 for details.
10 GPS DATUM:	Select the GPS datum to be used.
11 XBAND REPEATER:	Activates Cross Band Repeater operation. Set the right band to a 144 MHz frequency and the left band to a 430MHz frequency (or vice versa) before beginning this procedure.

4. Once you have made your selection in step 3, press the *left side* [**DIAL**] knob and
   confirm that (**OK?** [**SET**]) is displayed on the LCD. Press the *left side* [**DIAL**] knob
   once more to complete the reset procedure. (To cancel the reset procedure, press the
   [**ESC**] key before pressing the *left side* [**DIAL**] knob.)

CLONING

The **FTM-350R** includes a convenient "Clone" feature, which allows the memory and configuration data from one transceiver to be transferred to another **FTM-350R**. This can be particularly useful when configuring a number of transceivers for a public service operation. Here is the procedure for Cloning one radio's data to another:

1. Turn both radios "off".
2. Connect the optional **CT-135** Clone Cable between the **DATA** jacks of the two radios.
3. Turn the radio on while pressing and holding the key which is located to the left of the [**POWER**] switch to enter the "Special Function" mode. Do this for both radios (the order of switch-on does not matter).
4. On the "Destination" radio, rotate the *left side* [**DIAL**] knob to select function menu item "**1 CLONE RX**", then press the *left side* [**DIAL**] knob *twice*.
5. On the "Source" radio, rotate the *left side* [**DIAL**] knob to select function menu item "**2 CLONE TX**", then press the *left side* [**DIAL**] knob. The data from this radio will be transferred to the other radio.
6. If there is a problem during the cloning process, "ERROR" will be displayed. Check your cable connections and battery voltage, and try again.
7. If the data transfer is successful, the "Destination" radio displays "**RECEIVED....**" then turns "off" automatically and turns "on" again.
8. Press the [**DIAL**] key of the "Source" radio. The "Source" radio will now automatically turn "off" and turn back "on" again.
9. Turn both radios "off" and disconnect the Clone Cable.

INSTALLATION

This chapter describes the installation procedure for integrating the **FTM-350R** into a typical amateur radio station. It is presumed that you possess technical knowledge and conceptual understanding consistent with your status as a licensed radio amateur. Please take some extra time to make certain that the important safety and technical requirements detailed in this chapter are followed closely.

PRELIMINARY INSPECTION

Inspect the transceiver visually immediately upon opening the packing carton. Confirm that all controls and switches work freely, and inspect the cabinet for any damage. Gently shake the transceiver to verify that no internal components have been shaken loose due to rough handling during shipping.

If any evidence of damage is discovered, document it thoroughly and contact the shipping company (or your local dealer, if the unit was purchased over-the-counter) so as to get instructions regarding the prompt resolution of the damage situation. Be certain to save the shipping carton, especially if there are any punctures or other evidence of damage incurred during shipping. If it is necessary to return the unit for service or replacement, use the original packing materials. Then put the entire package inside another packing carton to preserve the evidence of shipping damage for insurance purposes.

INSTALLATION TIPS

To ensure long life of the components, be certain to provide adequate ventilation around the cabinet of the **FTM-350R**.

Do not install the transceiver on top of another heat-generating device (such as a power supply or amplifier). Avoid heating vents and window locations that could expose the transceiver to excessive direct sunlight, especially in hot climates. The **FTM-350R** should not be used in an environment where the ambient temperature exceeds +140 °F (+60 °C).

SAFETY INFORMATION

The **FTM-350R** is an electrical apparatus, as well as a generator of High RF (Radio Frequency) energy. You should exercise all safety precautions that are appropriate for this type of device. These safety tips apply to any device installed in a well-designed amateur radio station.

Never allow unsupervised children to play in the vicinity of your transceiver or antenna installation.

Be certain to wrap any wire or cable splices thoroughly with insulating electrical tape, to prevent short circuits.

Do not route cables or wires through doorjambs or other locations where they may become frayed and shorted to ground or to each other.

Do not stand in front of a directional antenna while you are transmitting into that antenna.

Do not install a directional antenna in any location where humans or pets may walk in the main directional lobe of the antenna's radiation pattern.

In mobile installations, it is preferable to mount the antenna on top of the vehicle, if feasible, this will utilize the car body as a counterpoise and raise the radiation pattern as far away from passengers as possible.

During mobile operation when stopped (in a parking lot, for example), make it a practice to switch to Low power if there are people walking nearby.

Never wear dual-earmuff headphones while driving a vehicle.

Do not attempt to drive your vehicle while making a telephone or auto patch call while using the optional DTMF microphone. Pull over to the side of the road, whether dialing manually or using the auto-dial feature.

Warning!: High RF voltage is present in the TX RF section of the transceiver while transmitting. Do not touch the TX RF section while transmitting.

SPECIFICATIONS

General

Frequency Ranges:	RX: 0.5-1.8 MHz (AM Radio)
	76-108 MHz (FM Radio)
	108-137 MHz (Air Band)
	137-174 MHz (144 MHz HAM Band)
	174-250 MHz (VHF TV Band)
	300-420 MHz (General 1)
	420-470 MHz (430 MHz HAM Band)
	470-800 MHz (UHF TV Band)
	800-1000 MHz (General 2: USA Cellular Blocked)
	TX: 144-146(148) MHz (Ham Band)
	222-225 MHz (USA only)
	430-440(450) MHz (Ham Band)
Channel Steps:	5, 6.25, 8.33, (9), 10, 12.5, 15, 20, 25, 50, 100, 200 kHz
	(9): AM Radio Only
Frequency Stability:	±5ppm (14 °F to +140 °F [–10 °C to +60 °C])
Repeater Shift:	±600 kHz (144 MHz)
	±1.6 / 5.0 / 7.6 MHz (430 MHz)
Emission Type:	F1, F2, F3,
Antenna Impedance:	50 Ω
Supply Voltage:	Nominal: 13.8 V DC, Negative Ground
	Operating: 11.7 ~ 15.8 V, Negative Ground
Current Consumption:	0.5 A (Receive)
	10 A (TX, 144 MHz 50W)
	10 A (TX, 430 MHz 50W)
Operating Temperature:	–4 °F to +140 °F (–20 °C to +60 °C)
Case Size (WxHxD):	Panel: 6.2" x 2.6" x 1.3" (157 x 66 x 33.5 mm)
	w/o knob & connectors
	Rear Chassis: 5.5" x 1.8" x 5.9" (140 x 46 x150 mm)
	w/o connectors
Weight (Approx.)	4.6 lbs (2.1 kg) Panel + Rear Chassis + Connection Cable

Specifications are subject to change without notice, and are guaranteed within the 144/ 222/430 MHz amateur bands only.

Cellular Blocked per FCC rule Part 15.121, may not receive 900 MHz Amateur band.

SPECIFICATIONS

Transmitter
RF Power Output: 50 / 20 / 5 W
Modulation Type: Variable Reactance F1, F2, F3
Maximum Deviation: ±5 kHz
Spurious Emission: At least 60 dB below
Microphone Impedance: 2 kΩ

Receiver
Circuit Type: Double-Conversion Super heterodyne (FM/AM)
                           Triple-Conversion Super heterodyne (WFM)
                           Single-Conversion Super heterodyne (Radio)
Intermediate Frequencies: 1st: 47.25 MHz, 2nd: 450 kHz ("Left Side" Band, FM/AM)
                           1st: 44.85 MHz, 2nd: 450 kHz ("Right Side" Band, FM/AM)
                           1st: 45.8 MHz, 2nd: 10.7MHz, 3rd: 1MHz
                                                      ("Left Side" Band, WFM)
                           1st: 44.0 MHz, 2nd: 10.7MHz, 3rd: 400 kHz
                                                   ("Right Side" Band, WFM)
                           1st: 130 kHz (FM Radio)
                           1st: 50 kHz (AM Radio)
Sensitivity: 5 µV TYP for 10 dB SN (0.5-1.7 MHz, AM)
                           2 µV TYP for 12 dB SINAD (76-108 MHz, WFM)
                           0.8 µV TYP for 10 dB SN (108-137 MHz, AM)
                           0.2 µV for 12 dB SINAD (137-140 MHz, FM)
                           0.2 µV for 12 dB SINAD (140-150 MHz, FM) EXP
                           0.25 µV for 12 dB SINAD (150-174 MHz, FM)
                           1 µV TYP for 12 dB SINAD (174-222 MHz, WFM)
                           0.8 µV TYP for 10 dB SN (300-336 MHz, AM)
                           0.25 µV TYP for 12 dB SINAD (336-420 MHz, FM)
                           0.2 µV for 12 dB SINAD (420-470 MHz, FM) EXP
                           5 µV TYP for 12 dB SINAD (470-540 MHz, WFM)
                           5 µV TYP for 12 dB SINAD (540-800 MHz, WFM)
                           0.4 µV TYP for 12 dB SINAD (800 -899.99 MHz, FM)
                           0.8 µV TYP for 12 dB SINAD (800 -999.99 MHz, FM)
                                            USA Version Cellular Blocked
Squelch Sensitivity: 0.16 µV (144 / 430 MHz Band)
Selectivity (NFM, AM): 12 kHz / 30 kHz (–6 dB / –60 dB)
AF Output: 8 W @ 4 Ω for 10 % THD (@ 13.8 V) BTL EXP SP
                           4 W @ 4 Ω for 10 % THD (@ 13.8 V) Normal EXP SP
AF Output Impedance: 4-16 Ω

ACCESSORIES & OPTIONS

SUPPLIED ACCESSORIES

DTMF Microphone	**MH-48A6JA**
Mobile Mounting Bracket for Panel and Rear chassis	
DC Power Cord W/Fuse	
Speaker Cable	
Spare Fuse 15 A	
Operating Manual	
Warranty Card	

OPTIONAL ACCESSORIES

DTMF Microphone	**MH-48A6JA**
Hand Microphone	**MH-42C6J**
Control Cable (6m)	**CT-132**
Bluetooth® Headset (Monaural)	**BH-1A**
Bluetooth® Headset (Stereo)	**BH-2A**
Bluetooth® Unit	**BU-1**
Charger Sleeve for the **BH-1A**/**BH-2A**	**CAB-1**
Earphone for **BH-1A**	**FEP-4**
High-Power External Speaker	**MLS-200-M10**
AC Power Supply (25 A)	**FP-1025A**
AC Power Supply (30 A)	**FP-1030A**
GPS Extension Cable	**CT-133**
Voice Guide Unit	**FVS-2**
Monitor Unit	**FPR-1**
Internal GPS Receiver Unit	**FGPS-1**
External GPS Receiver Unit	**FGPS-2**
External GPS Adapter	**CT-136**
Clone Cable	**CT-135**
Packet Cable (DIN 8-pin ↔ Din 6-pin + Dsub 9-pin)	**CT-140**
Packet Cable (DIN 8-pin ↔ Din 6-pin)	**CT-141**
Packet Cable (DIN 8-pin ↔ Dsub 9-pin)	**CT-142**

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