Instructions for advanced operations and additional details are described in this manual. See the Basic manual for the basic operations, especially for new users.
Table of contents

1. ADVANCED CONNECTIONS ........................................... 1
   ■ 137 kHz band operation ......................................... 1
   ■ Connecting the RC-28 ....................................... 2
     Using the RC-28 ............................................ 2
   ■ FSK, AFSK, PSK connections ............................... 3
   ■ Connecting the AH-740 ...................................... 4

2. ADVANCED OPERATIONS ........................................... 5
   ■ Band Edge Beep .............................................. 5
   ■ Entering Band Beep Edges ................................... 5
   ■ Adjusting the Drive Gain level ............................. 9
   ■ IP Plus function ............................................ 9
   ■ Tracking function ........................................... 10
   ■ VOX function ................................................ 11
     Adjusting the VOX function .................................. 11
     Turning ON the VOX function ................................ 11
   ■ ATX function .................................................. 12
     ATX monitor function ......................................... 12
   ■ Operating CW (ADVANCED) .................................... 13
     About the CW Reverse mode .................................. 13
     Using the Memory Keyer function (KEYER) ............... 13
     Keyer memory edit menu (EDIT) .............................. 14
     Contest number menu (001 SET) ............................. 15
     Keyer set menu (CW-KEY SET) ................................ 16
   ■ Operating RTTY (FSK) ........................................ 17
     Displaying the RTTY DECODE screen ....................... 18
     RTTY decoding ................................................ 18
     Twin Peak Filter (TPF) .................................... 18
     Transmitting an RTTY memory content ..................... 19
     Setting the RTTY Automatic TX/RX ......................... 20
     Editing an RTTY memory ...................................... 21
     Turning ON the RTTY log .................................... 22
     Viewing the RTTY log contents .............................. 23
     RTTY Decode Log set ......................................... 23
   ■ Operating PSK ................................................... 25
     Displaying the PSK DECODE screen ......................... 25
     PSK decoding .................................................. 26
     AFC/NET function .......................................... 26
     Transmitting a PSK memory content ......................... 27
     Setting the PSK Automatic TX/RX ............................ 28
     Editing a PSK memory ........................................ 29
     Turning ON the PSK log ...................................... 30
     Viewing the PSK log contents ................................ 31
     PSK Decode Log set .......................................... 31
   ■ FM repeater operation ........................................ 33
     Setting the repeater tone frequency ......................... 33
     Checking the repeater input signal .......................... 34
   ■ Tone squelch operation ...................................... 35
   ■ Data mode (AFSK) operation ................................ 36
   ■ Transverter operation ........................................ 36
     Transverter setting example .................................. 36
   ■ About the 5 MHz frequency band operation ............. 37

3. ADVANCED SCOPE OPERATION ................................... 36
   ■ Spectrum Scope screen ...................................... 36
     Setting the Center mode span ............................... 36
     Setting the Fixed mode range ............................... 36
     Directly tuning to a signal .................................. 37
     Dual Scope screen ........................................... 37
     Sweep speed .................................................. 38
     Adjusting the Reference level ............................... 38
   ■ SCOPE SET screen .......................................... 39

4. VOICE RECORDER FUNCTIONS .................................... 42
   ■ Recording a QSO audio ..................................... 42
     Using the [REC] key ......................................... 42
     Using the [QUICK] key ....................................... 42
     Using the MENU screen ...................................... 42
   ■ Playing back a QSO audio .................................... 43
   ■ Playing back a recorded audio on a PC .................... 44
   ■ Checking the folder information ............................. 45
     and file information .......................................... 45
   ■ Deleting files .................................................. 46
   ■ Deleting folders .............................................. 46
   ■ RECORDER SET screen ...................................... 47
   ■ PLAYER SET screen ......................................... 48
   ■ INSTANT REPLAY SET screen .............................. 49
     Instant Replay function ..................................... 49
     Recording the Instant Replay ............................... 49
     Playing back the Instant Replay ............................ 49

5. VOICE TX MEMORY OPERATION ................................... 50
   ■ Recording a Voice TX memory ............................... 50
     Recording ...................................................... 50
     Playing back .................................................... 50
   ■ Entering a Voice TX memory name ......................... 51
   ■ Transmitting a Voice memory content ..................... 52
     Transmitting .................................................. 52
     Repeatedly transmitting ..................................... 53
     Adjusting the output level ................................... 53
   ■ VOICE TX SET screen ........................................ 54

6. SD CARD/USB FLASH DRIVE (ADVANCED) ..................... 50
   ■ Saving the setting data onto an SD card or USB flash drive ... 55
   ■ Loading the saved data files onto an SD card or USB flash drive ... 56
   ■ Deleting a data file .......................................... 57
   ■ Displaying the SD card or USB flash drive information ..................... 58
   ■ About the SD card and USB flash drive’s folders ................ 59
     The SD card folder .......................................... 59
     USB flash drive folder ..................................... 59
Table of contents (Continued)

7. MEMORY OPERATION ........................................... 60
   ■ Memory channels ........................................ 60
   ■ Selecting a Memory channel .......................... 60
   ■ Entering memory channel contents ............... 61
   ■ Copying the Memory channel contents .......... 62
       Copying to the VFO ................................ 62
       Copying to the other Memory channel .......... 62
   ■ Entering a memory name ............................. 63
   ■ Clearing a memory channel .......................... 64
   ■ About the MEMORY screen .......................... 64
   ■ Memo Pad .................................................. 65
       Saving the displayed contents
       into a Memo Pad ..................................... 65
       Called up the Memo Pads ............................ 65

8. SCANS .............................................................. 66
   ■ Scan types ............................................... 66
   ■ Preparation .............................................. 66
       Squelch status ....................................... 66
   ■ SCAN screen ............................................. 67
   ■ SCAN SET screen ....................................... 67
   ■ Programmed scan ...................................... 68
       Programmed scan operation ........................ 68
   ■ Memory scan ............................................. 69
       Memory scan operation .............................. 69
       Setting the Select Memory channels .......... 69
       Memory scan operation .............................. 70
   ■ ΔF scan ................................................... 71
       ΔF scan operation .................................... 71

9. CLOCK AND TIMERS (ADVANCED) ......................... 72
   ■ NTP function ............................................. 72
       Using the NTP Time Synchronize function .... 72
       Using the NTP function ............................. 72
   ■ Setting the Timers ..................................... 73
       Setting the Sleep Timer .............................. 73
       Setting the Daily Timer ............................. 74
       Daily Timer setting items ........................... 75

10. ANTENNA TUNER OPERATION (ADVANCED) ........... 76
    ■ Using the [RX-I/O] in the Dualwatch operation .. 76
    ■ Selecting the antenna connector ................. 77

11. OTHER FUNCTIONS ............................................. 78
    ■ RF Direct Sampling System ......................... 78
    ■ About the RF/SQL Control .......................... 79
    ■ About “USB SEND/Keying” .......................... 80
    ■ Measuring SWR ......................................... 81
    ■ Selecting the Display Type ......................... 82
    ■ Selecting the Display Font ......................... 82
    ■ Displaying my call sign ............................ 82
    ■ Screen Capture function ............................ 83
       Setting the Screen Capture function .......... 83
       Capturing a screen ................................. 83
       Viewing a captured screen ....................... 83
    ■ REF adjustment ....................................... 84

12. MAINTENANCE .................................................. 85
    ■ Cleaning .................................................. 85
    ■ Replacing fuse ......................................... 85
       DC power cable fuses ................................. 85
       Circuitry fuse ......................................... 86
    ■ Touch screen calibration function ............... 87

13. UPDATING THE FIRMWARE ................................. 88
    ■ General ................................................... 88
       About updating the firmware .................... 88
       Checking the firmware version .................. 88
       Preparation ............................................ 89
       Unzipping the firmware folder ................... 89
    ■ Updating the firmware .............................. 90

Icom, Icom Inc. and the Icom logo are registered trademarks of Icom Incorporated (Japan) in Japan, the United States, the United Kingdom, Germany, France, Spain, Russia, Australia, New Zealand and/or other countries.
Microsoft, Windows and Windows Vista are registered trademarks of Microsoft Corporation in the United States and/or other countries.
Adobe, Acrobat, and Reader are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States and/or other countries.
All other products or brands are registered trademarks or trademarks of their respective holders.
Functions and features of Adobe® Acrobat® Reader®

The following functions and features can be used with Adobe® Acrobat® Reader®.

• **Keyword search**

  Click “Find” (Ctrl+F) or “Advanced Search” (Shift+Ctrl+F) in the Edit menu to open the search screen. This is convenient when searching for a particular word or phrase in this manual.

  *The menu screen may differ, depending on the Adobe® Acrobat® Reader® version.*

• **Find screen**

  Click to open the find or search screen or advanced search screen.

• **Advanced search screen**

  Click to open the find or search screen or advanced search screen.

• **Printing out the desired pages.**

  Click “Print” in File menu, and then select the paper size and page numbers you want to print.

  *The printing setup may differ, depending on the printer. Refer to your printer’s instruction manual for details.*

  *Select “A4” size to print out the page in the equalized size.*

• **Read Out Loud feature.**

  The Read Out Loud feature reads aloud the text in this Instruction Manual.

  *This feature may not be usable, depending on your PC environment including the operating system.*

*The screen may differ, depending on the Adobe® Acrobat® Reader® version.*
1. ADVANCED CONNECTIONS

137 kHz band operation (European version only)

You can also operate between 135.7 kHz to 137.8 kHz in the CW mode. The RF signal from [X-VERTER] is used for this operation.

- The output of [X-VERTER] is −20 dBm so an up to 1 W linear amplifier may be required.
- See the connection illustration to the right.

- Be sure to turn OFF the transceiver and the amplifier when connecting them.
- To enable the [X-VERTER] connector, set the “Transverter Function” item to ON, or connect a DC voltage to [ACC 2 (6: TRV)] (★1).

- Set the offset frequency in the “Transverter Offset” item to “0.000 MHz” to match the transceiver’s operating frequency with the transmitting frequency.
- The antenna cannot be selected, and the internal antenna tuner cannot be used while the Transverter function is turned ON.
Connecting the RC-28

The optional RC-28 REMOTE ENCODER can be used as a sub dial.

NOTE:
• See the RC-28’s manual to use the RC-28 with the RS-BA1 IP REMOTE CONTROL SOFTWARE.
• Using the RC-28 with other than the USB cable supplied with the RC-28, or connecting it through a USB hub, is not guaranteed by Icom.

Using the RC-28

[TRANSMIT] LED
Lights while transmitting.

[LINK] LED
Lights while the RC-28 is connected to the transceiver.

Main dial
Changes the Sub band’s operating frequency (default).

[F-1]/[F-2] LEDs*
[F1] lights when operating the Main band, and [F-2] lights when operating the Sub band.

[F-1]/[F-2] buttons*
Selects the Main band or Sub band to operate with the Main dial.

[TRANSMIT] button
Push to switch between transmit and receive.

* The [F-1] and [F-2] buttons or keys are disabled when “USB Dial Select” is set to “SUB Only.”

Setting the “USB Dial Select” to “MAIN/SUB” enables you to operate both the Main band and the Sub band, using the RC-28.

MENU » SET > Connectors > USB DIAL > USB DIAL SELECT
1. ADVANCED CONNECTIONS

FSK, AFSK, PSK connections

The transceiver has a mode keys for RTTY and PSK. You can use a PC and an application software to operate RTTY and PSK using a USB cable. However, if you want to operate AFSK or other digital modes, you can use the ACC socket on the rear panel through an interface unit. See the interface circuit diagram below for details. Refer to the software application’s instruction manual for setup details. (Icom does not guarantee performance of the application software, PC, network device or network settings.)

When using the USB port

![Interface circuit diagram](image)

**TIP:**
- If you set the “USB Serial Function” item to “RTTY Decode,” the decoded RTTY signals are output from the USB port.
- Download the USB driver and the installation guide from the Icom website. [http://www.icom.co.jp/world/index.html](http://www.icom.co.jp/world/index.html)

When using the ACC socket or the microphone connector

![Interface circuit example for digital modes](image)

**NOTE:** You cannot operate FSK RTTY when you connect the circuit to the microphone connector.

①See pages 13-2 to 13-3 in the Basic Manual for details on the ACC 1 socket and MIC connectors.
Connecting the AH-740

The optional AH-740 covers the 2.5 to 30 MHz range with a supplied whip antenna. Or when using with the optional NVIS kit, it covers the 2.2 to 30 MHz range. See the AH-740 instruction manual for installation and connection details.

Coaxial cable and control cable connections

About the ground strap connection
2. ADVANCED OPERATIONS

Band Edge Beep

You will hear a Band Edge Beep and TX ("TX" with a border of short dashes) will be displayed when you tune into or out of an amateur band’s frequency range.

Entering Band Beep Edges

When the “Band Edge Beep” item is set to “ON (User)” or “ON (User) & TX Limit,” you can enter a total of 30 band beep edge frequencies.

NOTE:
• Initially, all band edges are entered. Therefore, you must first edit or delete them to enter a new band edge.
• You cannot enter an overlapped frequency or a frequency that is out of the preset transmit frequency band.

1. Open the “Band Edge Beep” screen.

2. Select “ON (User)” or “ON (User) & TX Limit.”
   • If you select “ON (User) & TX Limit,” you can limit transmission to within the entered frequency range.

3. Select “User Band Edge.”
   • The “User Band Edge” screen is displayed.

4. You can change the Band Edge Beep settings in the following menu.

   MENU » SET > Function > Band Edge Beep

Editing a Band Edge

You can edit a band edge that is entered as a default, or when entering a new band edge.

1. On the FUNCTION set screen, select “User Band Edge.”
2. Touch the band edge you want to edit.
   (Example: 7: 14.000.000 – 14.350.000 MHz)
3. Edit the lower band edge frequency.
   (Example: 14.1)

Entry examples
• 14.025 MHz: [1], [4], [•], [0], [2], [5], [ENT]
• 18.0725 MHz: [1], [8], [•], [0], [7], [2], [5], [ENT]
• 730 kHz: [0], [•], [7], [3], [ENT]
• 5.100 MHz: [5], [•], [1], [ENT]
• 7.000 MHz: [7], [ENT]
• Changing from 21.280 MHz to 21.245 MHz:
  [•], [2], [4], [5], [ENT]

4. Touch [ENT] to save the edited lower band edge frequency.

(Continued on the next page)
2. ADVANCED OPERATIONS

Band Edge Beep (continued)

Editing a Band Edge (Continued)

5. Edit the upper band edge frequency. (Example: 14.25)

6. Touch [ENT] to save the edited upper band edge frequency.
   • The edited band edge is saved and returns to the previous screen.

   **TIP:**
   • You can also edit the frequency by rotating MAIN DIAL or MULTI.
   • Each band edge must be higher in frequency than the ones above it. If you try to enter a lower frequency than the edge above, the lower frequency edge will be cleared when you push [ENT].

Inserting a Band Edge

After you edit the preset band edges, follow the steps below to insert a band edge.

1. Display the “User Band Edge” screen.
2. Touch the band edge you want to insert a new band edge above for 1 second. (Example: 1: 3.500.000 – 3.999.999 MHz)
   • The new band edge will be inserted above the selected band edge.

3. Touch “Insert.”

4. Enter the lower and upper band edge frequency. (Example: 18.000.000 – 19.999.999 MHz)
   • See Editing a Band Edge on the previous page for details on entering the band edge frequencies.

5. Touch [ENT] to save the entered band edge frequencies.
   • The entered band edge is saved and returns to the previous screen.
2. ADVANCED OPERATIONS

Band Edge Beep (continued)

Entering a new Band Edge
After you edit (or delete) the preset band edges, you can enter a new band edge.

1. Open the “User Band Edge” screen.
2. Select a blank band. (Example: 9)
3. Enter the lower and upper band edge frequency. (Example: 51.150.000 – 51.750.000 MHz)
   • See Editing a Band Edge on page 5 for details on entering the band edge frequencies.
4. Touch [ENT] to save the entered band edge frequencies.
   • The entered band edge is saved and returns to the previous screen.

Deleting a Band Edge
You can delete band edges doing the following steps.

1. On the FUNCTION set screen, select “User Band Edge.”
2. Touch the band edge you want to delete for 1 second. (Example: 1: 1.800.000 – 1.999.999 MHz)
3. Touch “Delete.”
   • The selected band edge is deleted and returns to the previous screen.

1.800.000 – 1.999.999 MHz is deleted.
2. ADVANCED OPERATIONS

Band Edge Beep (continued)

Resetting all band edges to presets
The steps below will reset all the band edges to their initial settings. All entered settings will be deleted.

1. Display the “User Band Edge” screen.
2. Touch any band edge for 1 second.

![User Band Edge screen]

3. Touch “Default.”

![Quick Menu screen]

• Displays “Reset All Edges?”
4. Touch [YES].

![Reset All Edges screen]

• All the band edges will be reset to the initial settings.
2. ADVANCED OPERATIONS

Adjusting the Drive Gain level

Adjust the transmitter level at the driver stage. This reduces distortion in the transmitting signal. 

1. Touch the meter to display the ALC meter.

2. Push (QUICK).
3. Touch “Drive Gain.”
4. Hold down [PTT] (or push TRANSMIT).
   • The TX/RX indicator lights red and TX is displayed.
5. Rotate (MULT) to adjust the Drive Gain level.

6. Release [PTT] (or push TRANSMIT).
   • Returns to receive.

IP Plus function

The IP Plus function improves the Intermodulation Distortion (IMD) quality by optimizing the direct sampling system performance.

This function optimizes the Analog/Digital Converter (ADC) against distortion when you receive a strong input signal. It also improves the Third-order Intercept Point (IP3) while minimizing the reduction of the receiver sensitivity.

Touch [IP+] on the side menu to turn the IP Plus function ON or OFF.

ON: Prioritizes the IP quality.
OFF: Prioritizes the receive sensitivity.
Tracking function

While in the Dualwatch operation, and when different antennas are set to the Main and Sub bands, using this function enables you to hear which antenna has better reception.

1. Push [MENU] to display the MENU screen.
2. Touch [TRACKING] for 1 second to turn ON the Tracking function.
   • The MAIN/SUB indicator blinks in blue.

3. Push [MAIN/SUB] to select the operating band
   (Example: Main band).
   • The MENU screen is closed.
   ① The Sub band’s operating frequency and mode are synchronized with the Main band’s.
   ② When using the RC-28, if the offset frequency is set between the Main band and the Sub band, the frequency changes with the offset amount when rotating [MAIN DIAL].

4. Hold down [MAIN/SUB] for 1 second to turn OFF the Tracking function.

The Tracking function will be canceled when:
• Starting a scan.
• Changing the operating band, or directly entering the operating frequency on the Sub band.
• Changing from the Memory mode and the VFO mode, vice versa, and so on.

TIP: Setting the “MAIN/SUB Tacking [MAIN/SUB] Switch” item to ON enables you to turn ON the Tracking function by holding down [MAIN/SUB] for 1 second.
2. ADVANCED OPERATIONS

VOX function

Mode: SSB, AM and FM

The VOX (Voice-Operated Transmission) function switches between transmit and receive with your voice. This function enables hands-free operation.

◊ Adjusting the VOX function
Before using the VOX function, adjust the following items.
- VOX GAIN
- ANTI VOX
- DELAY
- VOICE DELAY

1. Touch [VOX] for 1 second.
   • Opens the VOX menu.

2. Touch the adjusting item.
   (Example: ANTI VOX)

3. Rotate <MULTI> to adjust the selected item.
   ①Adjust to the point where the transceiver does not switch to transmit due to the sound from the speaker or other devices.
   ②Touching VOICE DELAY selects “SHORT,” “MID,” “LONG” or “OFF.”

VOX GAIN (Default: 50%)
Adjust the transmit/receive switching threshold level to between 0% and 100% for VOX operation. Higher values make the VOX function more sensitive to your voice.

ANTI VOX (Default: 50%)
Adjust the ANTI VOX level to between 0% and 100% to prevent unwanted VOX activation from the speaker or other sounds. Higher values make the VOX function less sensitive.

DELAY (Default: 0.2s)
Adjust the DELAY to between 0 and 2.0 seconds, for a convenient interval for normal pauses in speech before returning to receive.

VOICE DELAY (Default: OFF)
Set the VOICE DELAY to prevent picking up your voice when switching to transmit. Select “SHORT,” “MID,” “LONG” or OFF.

◊ Turning ON the VOX function
1. Set the operating mode to SSB, AM or FM.
2. Touch [VOX] to turn ON the VOX function.
   * “VOX” is displayed while the VOX function is ON.

   Displayed

   ①Touching [VOX] again turns OFF the VOX function.
2. ADVANCED OPERATIONS

**ΔTX function**

The ΔTX function shifts the transmit frequency up to ±9.99 kHz without shifting the receive frequency.

1. Push (ΔTX).
   - The ΔTX function turns ON.
     - Pushing ΔTX turns the ΔTX function ON or OFF.
     - While using the Fine Tuning function (See Basic manual section 3), the ΔTX frequency is displayed in 4 digits, instead of 3.

2. Rotate (RIT/ΔTX) to set the ΔTX frequency to match the receiving station's frequency.

3. To turn OFF the ΔTX function, push (ΔTX).

**◊ ΔTX monitor function**

When the ΔTX function is ON, you can directly monitor the operating frequency by holding down (XFC).

1. While monitoring, the TX/RX indicator lights green and the Noise Reduction, Notch Filter and Twin PBT settings are cleared.

While holding down (XFC).

1. To reset the ΔTX frequency to “0.00,” hold down (CLEAR) for 1 second.
2. You can add the frequency shift to the operating frequency by holding down (ΔTX) for 1 second.
2. ADVANCED OPERATIONS

Operating CW (ADVANCED)

◊ About the CW Reverse mode
The CW-R (CW Reverse) mode reverses the receive Beat Frequency Oscillator (BFO) to receive CW signals. Use this when interfering signals are near the desired signal and you want to use the CW-R to reduce interference.

◊ Using the Memory Keyer function (KEYER)
You can send preset characters using the Memory Keyer function.

Sending
1. Display the KEYER SEND screen.

   1. Display the KEYER SEND screen.

   2. Touch 
   
   3. Touch a Memory Keyer key between [M1] and [M8].

   4. To stop sending, touch the Memory Keyer key again.

   5. The Memory contents will be repeatedly sent, according to the setting in “Keyer Repeat Time.”

TIP: Reversing the carrier point
The carrier point of the CW mode is LSB by default. You can change it to USB on the FUNCTION screen.

   » SET > Function > CW Normal Side

   When this setting is set to “USB,” the CW and CW-R modes are reversed.

Using the Memory Keyer function (KEYER)
You can send preset characters using the Memory Keyer function.

Sending
1. Display the KEYER SEND screen.

   1. Display the KEYER SEND screen.

   2. Push 
   
   3. Touch a Memory Keyer key between [M1] and [M8].

   4. To stop sending, touch the Memory Keyer key again.

   5. The Memory contents will be repeatedly sent, according to the setting in “Keyer Repeat Time.”

TIP: Reversing the carrier point
The carrier point of the CW mode is LSB by default. You can change it to USB on the FUNCTION screen.

   » SET > Function > CW Normal Side

   When this setting is set to “USB,” the CW and CW-R modes are reversed.

Using the Memory Keyer function (KEYER)
You can send preset characters using the Memory Keyer function.

Sending
1. Display the KEYER SEND screen.

   1. Display the KEYER SEND screen.

   2. Push 
   
   3. Touch a Memory Keyer key between [M1] and [M8].

   4. To stop sending, touch the Memory Keyer key again.

   5. The Memory contents will be repeatedly sent, according to the setting in “Keyer Repeat Time.”

TIP: Reversing the carrier point
The carrier point of the CW mode is LSB by default. You can change it to USB on the FUNCTION screen.

   » SET > Function > CW Normal Side

   When this setting is set to “USB,” the CW and CW-R modes are reversed.

Using the Memory Keyer function (KEYER)
You can send preset characters using the Memory Keyer function.

Sending
1. Display the KEYER SEND screen.

   1. Display the KEYER SEND screen.

   2. Push 
   
   3. Touch a Memory Keyer key between [M1] and [M8].

   4. To stop sending, touch the Memory Keyer key again.

   5. The Memory contents will be repeatedly sent, according to the setting in “Keyer Repeat Time.”

TIP: Reversing the carrier point
The carrier point of the CW mode is LSB by default. You can change it to USB on the FUNCTION screen.

   » SET > Function > CW Normal Side

   When this setting is set to “USB,” the CW and CW-R modes are reversed.

Using the Memory Keyer function (KEYER)
You can send preset characters using the Memory Keyer function.

Sending
1. Display the KEYER SEND screen.

   1. Display the KEYER SEND screen.

   2. Push 
   
   3. Touch a Memory Keyer key between [M1] and [M8].

   4. To stop sending, touch the Memory Keyer key again.

   5. The Memory contents will be repeatedly sent, according to the setting in “Keyer Repeat Time.”

TIP: Reversing the carrier point
The carrier point of the CW mode is LSB by default. You can change it to USB on the FUNCTION screen.

   » SET > Function > CW Normal Side

   When this setting is set to “USB,” the CW and CW-R modes are reversed.

Using the Memory Keyer function (KEYER)
You can send preset characters using the Memory Keyer function.

Sending
1. Display the KEYER SEND screen.

   1. Display the KEYER SEND screen.

   2. Push 
   
   3. Touch a Memory Keyer key between [M1] and [M8].

   4. To stop sending, touch the Memory Keyer key again.

   5. The Memory contents will be repeatedly sent, according to the setting in “Keyer Repeat Time.”

TIP: Reversing the carrier point
The carrier point of the CW mode is LSB by default. You can change it to USB on the FUNCTION screen.

   » SET > Function > CW Normal Side

   When this setting is set to “USB,” the CW and CW-R modes are reversed.
Count up trigger
The count up trigger enables the serial number to be automatically increased after each complete serial number exchange is sent. (Default: M2)

Count up trigger icon
Present number counter

Press “001” is displayed on the Memory keyer set to the count up trigger.

You can change the count up trigger setting in the KEYER 001 menu. (See Basic manual section 4)

Preset Memory keyer contents

<table>
<thead>
<tr>
<th>Memory keyer</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1</td>
<td>CQ TEST CQ TEST DE ICOM ICOM TEST</td>
</tr>
<tr>
<td>M2</td>
<td>UR 5NN 001 BK</td>
</tr>
<tr>
<td>M3</td>
<td>CFM TU</td>
</tr>
<tr>
<td>M4</td>
<td>QRZ?</td>
</tr>
</tbody>
</table>

“001” is the CW contest number.
If you want to set the Count up trigger to different keyer, select other keyer in “Keyer memory edit menu (EDIT)” (See Basic manual section 4).

Using a USB keyboard or external keypad
You can send the preset contents without opening the KEYER screen. See Basic manual section 13).

Keyer memory edit menu (EDIT)
Edit the Memory keyer contents in the EDIT menu.
You can use up to a total of 8 Memory keyers (M1 to M8), and you can enter up to 70 characters in each memory.

Editing
(Example: Entering “QSL TU DE JA3YUA TEST” to M3)

1. Display the KEYER MEMORY screen in the CW mode.

2. Touch “CFM TU” for 1 second.

3. Touch “Edit.”

4. Touch [CLR] on the Keyer Memory keyboard until the preset contents are cleared.

(Continued on the next page)
Operating CW (ADVANCED) (Continued)

Keyer memory edit menu (EDIT) (Continued)

5. Enter “QSL TU DE JA3YUA TEST,” and then touch [ENT] to save.

6. To close the KEYER MEMORY screen, push [EXIT] several times.

Contest number menu (001 SET)
You can set the number style, count up trigger and preset number.

Setting
1. Display the KEYER 001 menu in the CW mode.

```
MENU » KEYER > EDIT/SET > 001 SET
```

2. Select the setting item.  
(Example: Number Style)

```
Number Style
Count Up Trigger
Present Number
```

3. Select the setting option.

- Returns to the KEYER 001 menu.

4. To close the “Number Style” screen, push [EXIT] several times.

<table>
<thead>
<tr>
<th>Selectable characters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alphabets</td>
</tr>
<tr>
<td>Symbols</td>
</tr>
<tr>
<td>Numbers</td>
</tr>
</tbody>
</table>

About the symbols
- Enter “^” to send a string of characters with no intercharacter space. Put “^” before a text string such as “AR,” and the string “ar” is sent with no space.
- Enter “*” (asterisk) to insert the CW contest number. The number automatically advances by 1. You can use this for only 1 Memory keyer at a time. “*” is used in Memory keyer M2 by default.

Number Style (Default: Normal)
Set the numbering system used for contest (serial) numbers—normal or short morse numbers.
- Select Normal, 190→ANO, 190→ANT, 90→NO or 90→NT.

Count Up Trigger (Default: M2)
Select which of the 8 memories will contain the contest serial number exchange.
- Select between M1 ~ M8.

Present Number (Default: 001)
Set the current number for the Count Up Trigger.
- Set to between 001 ~ 9999.
2. ADVANCED OPERATIONS

Operating CW (ADVANCED) (Continued)

Keyer set menu (CW-KEY SET)
In this menu, you can set the memory keyer repeat
time, dash weight, paddle specifications, key type,
and so on.

Setting example
1. Display the CW-KEY SET menu in the CW mode.
   MENU > KEYER > EDIT/SET > CW-KEY SET
2. Select the setting item.
   (Example: Side Tone Level)
3. Adjust the Side Tone Level.
   (Example: 80%)
4. To close the CW-KEY SET screen, push EXIT several times.

Dot/Dash Ratio  (Default: 1:1:3.0)
Set the dot/dash ratio.
• Set to between 1:1:2.8 ~ 1:1:4.5 in 0.1 steps.

Keying weight example: Morse code “K”

Paddle Polarity  (Default: Normal)
Set the paddle dot-dash polarity to Normal or Reverse.
• Normal: Right = dash, Left = dot
• Reverse: Right = dot, Left = dash

Key Type  (Default: ELEC-KEY)
Set the key type for the [KEY] connector on the rear panel.
• Set to Straight, Bug or Paddle.

MIC Up/Down Keyer  (Default: OFF)
Set the microphone [UP]/[DN] keys to use as a CW key.
• ON: Use the [UP]/[DN] keys as a CW key.
• OFF: Do not use the [UP]/[DN] keys as a CW key.
①The [UP]/[DN] keys do not work as a “squeeze key.”
②When “ON” is selected, you cannot change the frequency
   and the Memory channels using the [UP]/[DN] keys.

TIP: How to reset to the default setting
Touching the item or its option for 1 second displays the Quick menu, and then touch “Default” to reset to the default setting.
**Operating RTTY (FSK)**

The IC-7610 has a built-in RTTY decoder and encoder. Using a USB keyboard and the contents set in the RTTY TX memory, you can do basic RTTY operations without using an external device or software.

If you are using PSK software, refer to the software manual.

<table>
<thead>
<tr>
<th>Key</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;MENU1&gt; &lt;MENU2&gt;</td>
<td>Selects the Function menus.</td>
</tr>
<tr>
<td>HOLD/CLR</td>
<td>Touch turns the Hold function ON or OFF. “HOLD” is displayed, and the RTTY DECODE screen stops. Touch 1 sec. clears the displayed characters. While the Hold function is ON, this clears the characters and cancels the Hold function.</td>
</tr>
<tr>
<td>TX MEM</td>
<td>Opens the RTTY MEMORY screen.</td>
</tr>
<tr>
<td>ADJ</td>
<td>Opens the THRESHOLD screen. You can adjust the threshold level. Checking the RTTY DECODE, rotate MAIN DIAL to adjust the threshold level to where the characters are not displayed by noise.</td>
</tr>
<tr>
<td>DEF</td>
<td>Touch 1 sec. resets the threshold level to the default. The [DEF] key is displayed when after touching [ADJ].</td>
</tr>
<tr>
<td>MAIN/SUB</td>
<td>Changes between the Main or Sub band RTTY DECODE screen.</td>
</tr>
<tr>
<td>EXPAND</td>
<td>Selects the Expanded or Normal screen.</td>
</tr>
<tr>
<td>LOG</td>
<td>Displays the RTTY DECODE LOG screen. Starts/Stops logging, selects the file type or the time stamp.</td>
</tr>
<tr>
<td>LOG VIEW</td>
<td>Displays the RTTY DECODE LOG VIEW screen. You can check the saved RTTY log files.</td>
</tr>
<tr>
<td>SET</td>
<td>Displays the RTTY DECODE SET screen.</td>
</tr>
</tbody>
</table>
2. ADVANCED OPERATIONS

Operating RTTY (FSK) (Continued)

◊ Displaying the RTTY DECODE screen
With the built-in demodulator and decoder, received RTTY signals are displayed on the RTTY DECODE screen.

1. The decode screen for the PSK mode differs slightly from that of the RTTY mode.

MENU » DECODE

RTTY DECODE screen

Decoded characters
Transmitting
Selected band (MAIN)
FFT scope
Tuning indicator
RTTY memory title
Waterfall display

Transmitting contents (Example: RT1)

NOTE: "WAIT" appears next to the transmitting status indicator on the RTTY DECODE screen while buffering. If this appears, stop typing for a while and try transmitting again.

◊ RTTY decoding
Rotate MAIN DIAL to tune a signal.

1. Information
• Aim for a symmetrical waveform, and be sure the peak points align with the mark (2125 Hz) and shift (170 Hz) frequency lines in the FFT scope.
• Tune to where both "◄" and "►" are displayed in the tuning indicator.
• The S-meter displays the received signal strength, when a signal is received.
• If you are receiving an RTTY signal but cannot decode correctly, try in the RTTY-R (reverse) mode.

RTTY mode Normal
Space 170 Hz 2125 Hz Mark
RTTY-R mode
Space 2125 Hz 170 Hz Mark

BFO

TIP: If you cannot receive, change the settings for "RTTY Mark Frequency" and "RTTY Shift Width."

MENU » SET > Function > RTTY Mark Frequency
MENU » SET > Function > RTTY Shift Width

◊ Twin Peak Filter (TPF)
The Twin Peak Filter (TPF) changes the audio frequency response by boosting the mark and space frequencies for better reception of RTTY signals, or for decoding the AF output signal on a PC.

In the RTTY mode, push APF/TPF.
• The TPF function is turned ON, and the indicator on the key lights.

1. Pushing APF/TPF turns the Twin Peak Filter function ON or OFF.

NOTE: When you are using the Twin Peak Filter, the received audio output may increase. This is not a malfunction.
2. ADVANCED OPERATIONS

Operating RTTY (FSK) (Continued)

diamond Transmitting an RTTY memory content

You can transmit the preset characters on the RTTY MEMORY screen.

- You can edit the characters by touching [EDIT] on the RTTY MEMORY screen.

1. Display the RTTY DECODE screen in the RTTY mode.
   
   - The PSK mode screen differs slightly from the RTTY mode.

2. Touch [TX MEM].

   Memory Title Preset characters by default
   
<table>
<thead>
<tr>
<th>Memory</th>
<th>Title</th>
<th>Preset characters by default</th>
</tr>
</thead>
<tbody>
<tr>
<td>RT1</td>
<td>MYCALLx2</td>
<td>..DE ICOM ICOM K ..</td>
</tr>
<tr>
<td>RT2</td>
<td>MYCALLx3</td>
<td>..DE ICOM ICOM ICOM K ..</td>
</tr>
<tr>
<td>RT3</td>
<td>QSLUR599</td>
<td>..QSL UR 599–599 BK ..</td>
</tr>
<tr>
<td>RT4</td>
<td>DE+UR599</td>
<td>..QSL DE ICOM ICOM UR 599–</td>
</tr>
<tr>
<td>RT5</td>
<td>73 GL SK</td>
<td>..73 GL SK ..</td>
</tr>
<tr>
<td>RT6</td>
<td>CQ CQ CQ</td>
<td>..CQ CQ CQ DE ICOM ICOM</td>
</tr>
<tr>
<td>RT7</td>
<td>RIG&amp;ANT</td>
<td>..MY TRANSCEIVER IS IC-7610</td>
</tr>
<tr>
<td>RT8</td>
<td>EQUIP.</td>
<td>..MY RTTY EQUIPMENT IS INTERNAL FSK UNIT &amp;</td>
</tr>
</tbody>
</table>

3. Touch an RTTY memory between [RT1] and [RT8] to transmit.

   (Example: RT1)

   - The TX status indicator lights red and the Po meter swings.

   - To cancel the transmission and to return to the RTTY DECODE screen, push [EXIT].
   - After transmitting, automatically returns to receive.

When a keyboard is connected:

- You can transmit the preset contents in the RTTY memory (RT1 ~ RT8) by pushing [F1] ~ [F8] on the USB keyboard.

   After transmitting the contents, you can directly enter an RTTY message on the keyboard, and then push [F12] to transmit.

   To return to receive, push [F12] again.

- If the Auto TX/RX function is set to “OFF” or “AUTO RX” (p. 20), you can display the preset contents on the RTTY DECODE screen, and then transmit it by pushing [F12] on the keyboard.

- You can transmit the preset contents in the RTTY memory (RT1 ~ RT8) from an external device by setting the “External Keypad,” and then connecting an external keypad to [MIC] or [EXT KEYPAD] on the IC-7610.

   - You can transmit the preset contents in the RTTY memory (RT1 ~ RT8) from an external device by setting the “External Keypad,” and then connecting an external keypad to [MIC] or [EXT KEYPAD] on the IC-7610.
Operating RTTY (FSK) (Continued)

**Setting the RTTY Automatic TX/RX**
You can set to automatically transmit the RTTY memory contents, or to automatically return to receive after transmitting each memory (RT1 ~ RT8).

<table>
<thead>
<tr>
<th>Selection</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>The selected memory contents are displayed on the RTTY DECODE screen.</td>
</tr>
<tr>
<td></td>
<td>Push [F12] on the keyboard to transmit the selected memory, and push [F12] again to return to receive.</td>
</tr>
<tr>
<td>AUTO TX/RX</td>
<td>Automatically transmits the selected memory and returns to receive.</td>
</tr>
<tr>
<td>AUTO TX</td>
<td>Automatically transmits the selected memory, and then returns to receive by pushing [F12] on the keyboard.</td>
</tr>
<tr>
<td>AUTO RX</td>
<td>The selected memory contents are displayed on the RTTY DECODE screen.</td>
</tr>
<tr>
<td></td>
<td>Push [F12] on the keyboard to transmit the selected memory, and then it automatically returns to receive after transmission.</td>
</tr>
</tbody>
</table>

1. Display the RTTY DECODE screen.
2. Touch [TX MEM].
3. Touch [EDIT].
4. Touch the setting memory’s option. (Example: RT1’s AUTO TX/RX)
5. Touch to select an option. (Example: AUTO TX)
6. To exit the RTTY DECODE screen, push several times.
2. ADVANCED OPERATIONS

Operating RTTY (FSK) (Continued)

◊ Editing an RTTY memory
You can edit the characters in the RTTY memories. You can save and transmit 8 RTTY memories for often-used RTTY messages. Each RTTY memory can contain up to 70 characters.

1. Display the RTTY MEMORY editing screen.
2. Touch the memory to edit the content. (Example: RT2)
3. To clear a character, touch [←] or [→] to move the cursor, then touch [CLR].
4. Enter the new characters, and then touch [ENT] to save.
5. To exit the RTTY DECODE screen, push [EXIT] several times.
2. ADVANCED OPERATIONS

Operating RTTY (FSK) (Continued)

◇ Turning ON the RTTY log
Turn ON the RTTY log to save your TX and RX RTTY operating record onto an SD card.
① You can select the data format type in the “Log Set” item on the RTTY DECODE LOG screen.
② The log is saved even while “HOLD” is ON.

1. Display the RTTY DECODE LOG screen.

2. Touch “Decode Log.”

3. Select “ON.”

4. Push [EXIT].
   • “●” is displayed on the RTTY DECODE screen while the RTTY log is ON.

5. To turn OFF the RTTY log, select “OFF” in step 3.

Log Set > File Type (Default: Text)
Set the file type to save a log onto an SD card to “Text” or “HTML.”
① You cannot change the file type while logging.

TIP: How to reset to the default setting
Touching the item or its option for 1 second displays the Quick menu, and then touch “Default” to reset to the default setting.
2. ADVANCED OPERATIONS

Operating RTTY (FSK) (Continued)

◊ Viewing the RTTY log contents
You can view the saved RTTY log contents.

1. Insert the SD card that the RTTY log is saved.
2. Display the RTTY DECODE LOG VIEW screen.
   MENU ➔ DECODE ➔ <MENU1> ➔ LOG VIEW
3. Touch the log file to view.
   ◊ The file with “●” is logging. You cannot view this log’s contents.
4. To exit the RTTY DECODE LOG VIEW screen, push EXIT several times.

Checking the file information and deleting a file
1. Touch the log file that you want to view or delete for 1 second.
2. Select an item from “File Information,” “Delete” and “Delete All.”
   • File Information: Displays the file name, size and logged date.
   • Delete: Deletes the selected log file.
   • Delete All: Deletes all log files.

◊ RTTY Decode Log set
This mode is for the log file type, time stamp setting, and other RTTY settings.

1. Display the RTTY DECODE SET screen.
   MENU ➔ DECODE ➔ <MENU1> ➔ SET
2. Select an item to set.
   (Example: FFT Scope Averaging)
3. Select a setting option.
   (Example: 2)
   ◊ See the next page for details on the setting items and their options.
4. To exit the RTTY DECODE SET screen, push EXIT several times.

TIP: How to reset to the default setting
Touching the item or its option for 1 second displays the Quick menu, and then touch “Default” to reset to the default setting.
## 2. ADVANCED OPERATIONS

### Operating RTTY (FSK) (Continued)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RTTY Decode log set (Continued)</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| **FFT Scope Averaging** | OFF | Set the FFT scope waveform averaging function to between 2 and 4, or to OFF.  
①Use the default or a smaller FFT scope waveform number for tuning. |
| **FFT Scope Waveform Color** | R: 51, G: 153, B: 255 | Set the color of the FFT scope waveform.  
①Touch and select the R (Red), G (Green) or B (Blue) scale, and then rotate <MULTI> to adjust the ratio to between 0 and 255.  
①The color is displayed in the box above the RGB scale. |
| **Decode USOS** | ON | Turn the letter code decoding capability ON or OFF after receiving a “space.”  
①USOS stands for UnShift On Space function.  
• ON: Decodes as a letter code.  
• OFF: Decodes as a character code. |
| **Decode New Line Code** | CR, LF, CR+LF | Select the internal RTTY decoder new line code.  
①CR stands for Carriage Return, and LF stands for Line Feed.  
• CR,LF,CR+LF: Makes a new line with any codes.  
• CR+LF: Makes a new line with only CR+LF code. |
| **Diddle** | BLANK | Select the diddle status code.  
While transmitting in the RTTY mode, the selected code is transmitted when there is no code to transmit.  
①OFF: Turns OFF the Diddle function.  
①BLANK: Transmits blank codes.  
①LTRS: Transmits letter codes. |
| **TX USOS** | ON | Explicitly inserts the FIGS character, even though it is not required by the receiving station.  
• ON: Inserts FIGS  
• OFF: Does not insert FIGS |
| **Auto CR+LF by TX** | ON | Selects whether or not to automatically send a new line code (CR+LF) when transmitting.  
• ON: Transmits a CR+LF code.  
• OFF: Does not transmit the CR+LF code. |
| **Time Stamp** | ON | Select whether or not to display the time stamp (date, transmission time and reception time) on the RTTY DECODE screen and add it in the log.  
• OFF: Does not display or add the time stamp.  
• ON: Displays and adds the time stamp in the log. |
| **Time Stamp (Time)** | Local | Select whether or not to display the log on the RTTY DECODE screen and to save it, with the local time or with the UTC time when “Time Stamp” is ON.  
• Local: Displays and saves in the local time.  
• UTC: Displays and saves in the UTC. |
| **Time Stamp (Frequency)** | ON | Select whether or not to display the frequency information on the RTTY DECODE screen and to save it as a log when “Time Stamp” is ON.  
• OFF: Does not display or save as a log.  
• ON: Displays and saves as a log. |
| **Font Color (Receive)** | R: 128, G: 255, B: 128 | Set the text font color for receive characters.  
• R: Red  
• G: Green  
• B: Blue |
| **Font Color (Transmit)** | R: 255, G: 106, B: 106 | Set the text font color for transmit characters.  
• R: Red  
• G: Green  
• B: Blue |
| **Font Color (TX Buffer)** | R: 255, G: 255, B: 255 | Set the text font color for TX Buffer characters.  
• R: Red  
• G: Green  
• B: Blue |

**Note:**  
①Adjust the color within the range of 0 to 255.  
②The color is displayed in the box above the RGB scale.
### Operating PSK

A PSK encoder/decoder is built into the IC-7610. You can connect a USB keyboard to the transceiver and operate PSK without a PC. If you would rather use your PSK software, refer to its manual.

#### Displaying the PSK DECODE screen

With the built-in demodulator and decoder, received PSK signals are displayed on the PSK DECODE screen.

1. The decode screen for the PSK mode slightly differs from that of the RTTY mode.

#### PSK DECODE screen

<table>
<thead>
<tr>
<th>Function</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;MENU1&gt;</td>
<td>Selects the Function menus.</td>
</tr>
<tr>
<td>HOLD/CLR</td>
<td>Touch Turns the Hold function ON or OFF. &quot;HOLD&quot; is displayed and the current screen freezes. Touch 1 sec. Clears the displayed characters.</td>
</tr>
<tr>
<td>AFC/NET</td>
<td>Touch Toggles between AFC (AFC:ON), AFC/NET (AFC/NET: ON) or OFF. Touch 1 sec. Adds the offset frequency to the operating frequency.</td>
</tr>
<tr>
<td>TX MEM</td>
<td>Displays the PSK MEMORY screen.</td>
</tr>
<tr>
<td>ADJ</td>
<td>Touch 1 sec. Enters the threshold level adjustment mode.</td>
</tr>
<tr>
<td>DEF</td>
<td>Touch 1 sec. Sets the threshold levels to their defaults. This key is displayed after touching [ADJ].</td>
</tr>
<tr>
<td>MAIN/SUB</td>
<td>Toggles between the Main and Sub bands.</td>
</tr>
<tr>
<td>B/QPSK</td>
<td>Toggles between the BPSK and QPSK modes.</td>
</tr>
<tr>
<td>31/63</td>
<td>Toggles between the BPSK31 and BPSK63 modes.</td>
</tr>
<tr>
<td>LOG</td>
<td>Displays the PSK DECODE LOG set screen. Starts/stops saving a log file, or sets the file type.</td>
</tr>
<tr>
<td>LOG VIEW</td>
<td>Displays the PSK DECODE LOG VIEW screen. You can view the saved log contents.</td>
</tr>
<tr>
<td>SET</td>
<td>Displays the PSK DECODE SET screen.</td>
</tr>
</tbody>
</table>

#### Vector tuning indicator

The Vector tuning indicator is displayed when tuning PSK signals by rotating [MAIN DIAL].

**Indication example**

- Tuned BPSK signal
- Tuned QPSK signal
- BPSK/QPSK idle signal
- Unmodulated signal

**NOTE:** 

"WAIT" appears next to the transmitting status indicator on the PSK DECODE screen while buffering. If this appears, stop typing for a while and try transmitting again.
2. ADVANCED OPERATIONS

Operating PSK (Continued)

◊ PSK decoding
You can fine tune the PSK signal using the Vector tuning indicator and waterfall display.

- When a PSK signal is received, the vertical line appears on the waterfall display.
- Tune the vertical line to the center of the waterfall display.
- The signal is properly tuned when the radiated lines in the vector tuning indicator narrow, as shown on the previous page.

If the two or more signals are in the band, slowly rotate (MAIN DIAL) to tune the displayed signal to the 1500 Hz tone.

You can change the PSK tone frequency for receiving, in the following item.

MENU » SET > Function > PSK Tone Frequency

About the QPSK mode operation
The QPSK (Quadrature Phase Shift Keying) mode has error correction capability to provide better decoding than the BPSK mode in marginal conditions. However, more accurate tuning is required, due to the tight phase margin of QPSK.

If the received signal is not properly demodulated, try selecting the PSK-R mode.
- In the QPSK mode, the phase shift direction must be the same on both the transmit and receive sides.
- To receive the reverse direction signal, select the PSK-R mode to match the phase shift direction to the transmit side.

◊ AFC/NET function
The IC-7610 has an AFC (Auto Frequency Control) function which automatically tunes the PSK signal. It also has a NET function that transmits the PSK signal tuned using the AFC function.

1. Display the PSK DECODE screen.

MENU » DECODE

2. Touch [AFC/NET].
- Touching this key toggles between AFC (AFC:ON), AFC NET (AFC/NET: ON) or OFF (no icon).
- While the offset between the operating frequency and the PSK signal is displayed, touching [AFC/NET] for 1 second adds the offset frequency to the operating frequency.

NOTE:
- The AFC function may not tune the signal properly when a weak PSK signal is received.
- The AFC tuning range is set to ±15 Hz by default. You can select set to ±8 Hz in the following item.

MENU » DECODE > <MENU2> > SET > AFC Range

AFC, NET icons
Frequency offset
(Example: 15 Hz)
Transmitting a PSK memory content
You can transmit the preset characters on the PSK MEMORY screen.
①You can edit the characters by touching [EDIT] on the PSK MEMORY screen.

1. Display the PSK DECODE screen in the PSK mode.

   MENU » DECODE

   ①The PSK mode screen slightly differs from the RTTY mode.

2. Touch [TX MEM].

3. Touch an PSK memory between [PT1] and [PT8] to transmit.
   (Example: PT1)

   Transmission contents are displayed.

   • The TX status indicator lights red and the Po meter swings.
   ①To cancel the transmission and to return to the PSK DECODE screen, push [EXIT].
   ②After transmitting, automatically returns to receive.

<table>
<thead>
<tr>
<th>Memory</th>
<th>Title</th>
<th>Preset characters by default</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT1</td>
<td>MYCALLx2</td>
<td>..DE Icom Icom K</td>
</tr>
<tr>
<td>PT2</td>
<td>MYCALLx3</td>
<td>..DE Icom Icom Icom K</td>
</tr>
<tr>
<td>PT3</td>
<td>QSLUR599</td>
<td>..QSL UR 599 599 BK</td>
</tr>
<tr>
<td>PT4</td>
<td>DE+UR599</td>
<td>..QSL DE Icom Icom UR 599 599 BK</td>
</tr>
<tr>
<td>PT5</td>
<td>73 GL SK</td>
<td>..73 GL SK</td>
</tr>
<tr>
<td>PT6</td>
<td>CQ CQ CQ</td>
<td>..CQ CQ CQ Icom Icom Icom K</td>
</tr>
<tr>
<td>PT7</td>
<td>RIG&amp;ANT</td>
<td>..My transceiver is IC-7610 &amp; Antenna is a 3 element triband yagi.</td>
</tr>
<tr>
<td>PT8</td>
<td>EQUIP.</td>
<td>..My PSK equipment is internal modulator &amp; demodulator of the IC-7610.</td>
</tr>
</tbody>
</table>

When a keyboard is connected:

• You can transmit the preset contents in the PSK memory (PT1 ~ PT8) by pushing [F1] ~ [F8] on the USB keyboard.
   After transmitting the preset contents, you can directly enter a PSK message on the keyboard, and then push [F12] to transmit.
   To return to receive, push [F12] again.

• If the Auto TX/RX function is set to "OFF" or "AUTO RX" (p. 28), you can display the preset contents on the PSK DECODE screen, and then transmit it by pushing [F12] on the keyboard.

• You can transmit the preset contents in the PSK memory (PT1 ~ PT8) from an external device by setting the "External Keypad," and then connecting an external keypad to [MIC] or [EXT KEYPAD] on the IC-7610.
2. ADVANCED OPERATIONS

Operating PSK (Continued)

Setting the PSK Automatic TX/RX
You can set to automatically transmit the PSK memory contents or to automatically return to receive after transmitting for each memory (PT1 ~ PT8).

<table>
<thead>
<tr>
<th>Selection</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>The selected memory contents are displayed on the PSK DECODE screen. Push [F12] on the keyboard to transmit the selected memory and push [F12] again to return to receive.</td>
</tr>
<tr>
<td>AUTO TX/RX</td>
<td>Automatically transmits the selected memory and returns to receive.</td>
</tr>
<tr>
<td>AUTO TX</td>
<td>Automatically transmits the selected memory, and then returns to receive by pushing [F12] on the keyboard.</td>
</tr>
<tr>
<td>AUTO RX</td>
<td>The selected memory contents are displayed on the PSK DECODE screen. Push [F12] on the keyboard to transmit the selected memory, and then it automatically returns to receive after transmitting.</td>
</tr>
</tbody>
</table>

1. Display the PSK DECODE screen.

2. Touch [TX MEM].

3. Touch [EDIT].

4. Touch the setting memory’s option.
   (Example: PT1’s AUTO TX/RX)

5. Touch to select an option.
   (Example: AUTO TX)

6. To exit the PSK DECODE screen, push several times.
2. ADVANCED OPERATIONS

Operating PSK (Continued)

 않은 Editing a PSK memory

You can edit the characters in the PSK memories. You can save and transmit 8 PSK memories for often-used RTTY messages. Each PSK memory contains up to 70 characters.

1. Display the PSK MEMORY editing screen.

2. Touch the editing memory content.

(Example: PT2)

① You can also push "QUICK", and then touch "Edit Memory Content."

3. To clear a character, touch [←] or [→] to move the cursor, then touch [CLR].

4. Enter the new characters, and then touch [ENT] to save.

5. To exit the PSK DECODE screen, push EXIT several times.
## 2. ADVANCED OPERATIONS

### Operating PSK (Continued)

**Diamond: Turning ON the PSK log**

Turn ON the PSK decode log to save your TX and RX PSK operating record onto an SD card.

1. You can select the data format type in the “Log Set” item on the PSK DECODE LOG screen.
2. The log is saved even while “HOLD” is ON.

1. Display the PSK DECODE LOG screen.
2. Touch “Decode Log.”
3. Select “ON.”
4. Push **EXIT**.
   - “●” is displayed on the PSK DECODE screen while the PSK log is ON.
5. To turn OFF the PSK log, select “OFF” in step 3.

---

### Log Set > File Type (Default: Text)

Set the file type to save a log onto an SD card to “Text” or “HTML.”

1. You cannot change the file type while logging.

### TIP: How to reset to the default setting

Touching the item or its option for 1 second displays the Quick menu, and then touch “Default” to reset to the default setting.
Viewing the PSK log contents
You can view the saved PSK log contents.

1. Insert the SD card that the PSK log is saved.
2. Display the PSK DECODE LOG VIEW screen.

   MENU » DECODE > <MENU1> > LOG VIEW

3. Touch the log file to view.
   ① The file with “●” is logging. You cannot view this log’s contents.

4. To exit the PSK DECODE LOG VIEW screen, push [EXIT] several times.

Checking the file information and deleting a file
1. Touch the log file that you want to check or delete for 1 second.
2. Select an item from “File Information,” “Delete” and “Delete All.”
   • File Information: Displays the file name, size and logged date.
   • Delete: Deletes the selected log file.
   • Delete All: Deletes all log files.

PSK Decode Log set
This mode is for the log file type, time stamp setting, and other PSK settings.

1. Display the PSK DECODE SET screen.

   MENU » DECODE > <MENU1> > SET

2. Select an item to set.
   (Example: FFT Scope Averaging)

3. Select a setting option.
   (Example: 2)
   ① See the next page for details on the setting items and their options.

4. To exit the PSK DECODE SET screen, push [EXIT] several times.

TIP: How to reset to the default setting
Touching the item or its option for 1 second displays the Quick menu, and then touch “Default” to reset to the default setting.
Operating PSK (Continued)

- **PSK Decode log set (Continued)**

  - **FFT Scope Averaging** (Default: OFF)
    Set the FFT scope waveform averaging function to between 2 and 4, or to OFF.
    - Use the default or smaller FFT scope waveform number for tuning.

  - **FFT Scope Waveform Color** (Default: R: 51, G: 153, B: 255)
    Set the color of the FFT scope waveform.
    - Touch and select the R (Red), G (Green) or B (Blue) scale, and then rotate to adjust the ratio to between 0 and 255.
    - The color is displayed in the box above the RGB scale.

  - **AFC Range** (Default: ±15 Hz)
    Selects the AFC (Automatic Frequency Control) function's operating range from ±15 Hz and ±8 Hz.
    - The AFC function may not tune the signal properly when a weak PSK signal is received.

- **Time Stamp** (Frequency) (Default: ON)
  Select whether or not to display the frequency information on the PSK DECODE screen and to save it as a log when "Time Stamp" is ON.
  - OFF: Does not display or save as a log.
  - ON: Displays and saves as a log.

- **Font Color (Receive)** (Default: R: 128, G: 255, B: 128)
  - **Font Color (Transmit)** (Default: R: 255, G: 106, B: 106)
  - **Font Color (Time Stamp)** (Default: R: 0, G: 155, B: 189)
  - **Font Color (TX Buffer)** (Default: R: 255, G: 255, B: 255)
    Set the text font color for received, transmitting, time stamp characters.
    - Touch and select the R (Red), G (Green) or B (Blue) scale, and then rotate to adjust the ratio to between 0 and 255.
    - The color is displayed in the box above the RGB scale.

- **Time Stamp** (Time) (Default: Local)
  Select whether or not to display the log on the PSK DECODE screen and to save it, with the local time or with the UTC time when "Time Stamp" is ON.
  - Local: Displays and saves in the local time.
  - UTC: Displays and saves in UTC time.
2. ADVANCED OPERATIONS

**FM repeater operation**

A repeater receives your radio’s signals and simultaneously retransmits them on a different frequency to provide a greater communication range. When using a repeater, the transmit frequency shifts from the receive frequency by an offset amount. You can access a repeater using the split function.

1. Set the operating frequency in the FM mode. (Example: 29.650.00 MHz)

![Image](image1)

2. Hold down SPLIT for 1 second.
   - Turns ON the Quick Split function.
   - Turns the Tone function ON and “TONE” is displayed.
   - SPLIT function ON

![Image](image2)

Repeater Tone ON
Repeater’s receive frequency

- Split function ON

①You can set the frequency offset for the HF band.

   MENU » SET > Function > SPLIT > FM SPLIT Offset (HF)

①You can set the frequency offset for the 50 MHz.

   MENU » SET > Function > SPLIT > FM SPLIT Offset (50M)

**Setting the repeater tone frequency**

Some repeaters require a subaudible tone in order to be accessed. Subaudible tones are superimposed on your signal, and must be set first. Do the following steps to set the tone frequency.

1. Select the FM mode.
2. Touch [TONE] for 1 second.

![Image](image3)

3. Rotate MAIN DIAL to select the subaudible tone frequency.

   ![Image](image4)

   Resets the tone frequency to the default.

**Selectable tone frequencies**

<table>
<thead>
<tr>
<th>Tone Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>67.0 88.5 114.8 151.4 177.3 203.5 250.3</td>
</tr>
<tr>
<td>69.3 91.5 118.8 156.7 179.9 206.5 254.1</td>
</tr>
<tr>
<td>71.9 94.8 123.0 159.8 183.5 210.7</td>
</tr>
<tr>
<td>74.4 97.4 127.3 162.2 186.2 218.1</td>
</tr>
<tr>
<td>77.0 100.0 131.8 165.5 189.9 225.7</td>
</tr>
<tr>
<td>79.7 103.5 136.5 171.3 196.6 233.6</td>
</tr>
<tr>
<td>82.5 107.2 141.3 171.3 196.6 233.6</td>
</tr>
<tr>
<td>85.4 110.9 146.2 173.8 199.5 241.8</td>
</tr>
</tbody>
</table>

(Continued on the next page)
FM repeater operation (Continued)

Setting the repeater tone frequency (Continued)

Checking the repeater tone frequency
You can check the tone frequency by receiving the repeater’s input frequency using the tone scan. To receive the input signals, the transceiver detects the subaudible tone frequency using the tone scan function.

1. Touch [T-SCAN].
   - The scan starts, and then stops when a matching tone frequency the same as the repeater is received.

   ![Tone Frequency Screen]

   Blinks while scanning

2. To close the TONE FREQUENCY screen, push [EXIT].

Checking the repeater input signal
You can check whether you can directly receive another station’s transmit signal or not, by listening to the repeater input frequency.

1. While receiving, hold down [XFC] to listen the repeater input frequency.
2. While listening, the TX/RX indicator lights green, and then the Noise Reduction and Notch Filter settings are cancelled.

![Listening to Repeater Input Frequency]

Quick Split function ON

While holding down [XFC]. ▼ ▲ Release [XFC].

Another station’s transmit frequency
2. ADVANCED OPERATIONS

Tone squelch operation

The Tone squelch opens only when you receive a signal that includes a matching subaudible tone in the FM mode. You can silently wait for calls from other stations using the same tone.

When you transmit, the tone frequency is superimposed on your own signal.

1. Set the operating frequency in the FM mode.
   (Example: 29.550.00 MHz)
2. Touch [TONE] several times to select “TSQL.”
   Touching [TONE] changes between “TONE,” “TSQL” and “OFF.”
3. Touch [TONE] for 1 second.

• Selectable tone frequencies

| 67.0 | 88.5 | 114.8 | 151.4 | 177.3 | 203.5 | 250.3 |
| 69.3 | 91.5 | 118.8 | 166.7 | 179.9 | 206.5 | 254.1 |
| 71.9 | 94.8 | 123.0 | 159.8 | 183.5 | 210.7 |
| 74.4 | 97.4 | 127.3 | 162.2 | 186.2 | 218.1 |
| 77.0 | 100.0 | 131.8 | 165.5 | 189.9 | 225.7 |
| 79.7 | 103.5 | 136.5 | 167.9 | 192.8 | 229.1 |
| 82.5 | 107.2 | 141.3 | 171.3 | 196.6 | 233.6 |
| 85.4 | 110.9 | 146.2 | 173.8 | 199.5 | 241.8 |

4. Rotate [MAIN DIAL] to select the tone frequency.

Checking another station’s tone frequency

You can check another station’s tone frequency by tone scanning while the station is transmitting.

1. Touch [T-SCAN].
   • The scan starts, and then stops when the tone frequency as another station is received.

2. To close the TONE FREQUENCY screen, push [EXIT].
2. ADVANCED OPERATIONS

Data mode (AFSK) operation

You can operate in a data mode using AFSK (Audio Frequency Shift Keying).

1. When operating RTTY in the AFSK mode, PSK31 or JT65 with a PC application software, refer to the software’s instruction manual.

2. Connect a PC or other device to the transceiver.

3. Set the operating band and data operating mode. (Example: 50 MHz band, FM-D1)

4. Refer to your application software manual for setting and communication details.

   ① When operating in the SSB data mode, adjust the device’s output level to be within the ALC zone.

TIP: The carrier point is displayed when operating AFSK in the SSB data mode. See the illustration below for a tone-pair example in the LSB mode.

```
2295 Hz
170 Hz 2125 Hz
```

Transverter operation

You can use the Transverter function as an exciter for a transverter.

Transverter setting example

This is an example of operating a 144 MHz band transverter using the IC-7610’s 50 MHz band.

1. Connect the 144 MHz band transverter’s RF output to [X-VERTER].

2. Set the operating band and mode. (Example: 50 MHz band (MAIN), SSB)

3. Rotate [MAIN DIAL] to set the frequency. (Example: 50,000.00)

4. Turn ON the “Transverter function” in the following item (Example: 94 MHz).

   MENU » SET > Function > Transverter Function

5. Set the “Transverter Offset” in the following item.

   MENU » SET > Function > Transverter Offset

   • The offset frequency (94,000) set in this item is added to the operating frequency (50,000.00) to operate the 144 MHz band transverter.

   ① The first digit “1” is not displayed.

   Therefore, 144 MHz is displayed as “44.000.000.”

6. Push [EXIT] several times to close the SET screen.

   Displayed while the Transverter function is ON.

7. Rotate [MAIN DIAL] to set the frequency.
2. ADVANCED OPERATIONS

About the 5 MHz frequency band operation (USA version only)

Operation on the 5 MHz frequency band is allowed on 5 discrete frequencies and you must adhere to the following:

- The USB, USB Data, PSK, and CW modes.
- Maximum of 100 watts ERP (Effective Radiated Power)
- Maximum 2.8 kHz bandwidth

It is your responsibility to set all controls so that transmission in this frequency band meets the stringent conditions under which amateur operations may use these frequencies.

**TIP:** We recommend that you save these frequencies, modes and filter settings into memory channels, for easy recall.

**NOTE:** To assist you in operating within the rules specified by the FCC, transmission is illegal on any frequencies other than the five shown in the tables below.

<table>
<thead>
<tr>
<th>Transceiver displayed frequency</th>
<th>FCC channel center frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.33050 MHz</td>
<td>5.33200 MHz</td>
</tr>
<tr>
<td>5.34650 MHz</td>
<td>5.34800 MHz</td>
</tr>
<tr>
<td>5.35700 MHz</td>
<td>5.35850 MHz</td>
</tr>
<tr>
<td>5.37150 MHz</td>
<td>5.37300 MHz</td>
</tr>
<tr>
<td>5.40350 MHz</td>
<td>5.40500 MHz</td>
</tr>
</tbody>
</table>

**For the USB and USB data modes:**
The FCC specifies center frequencies on the 5 MHz frequency band. However, the transceiver displays carrier frequency. Therefore, tune the transceiver to 1.5 kHz below the specified FCC channel center frequency.

<table>
<thead>
<tr>
<th>Transceiver displayed frequency</th>
<th>FCC channel center frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.33200 MHz</td>
<td>5.33200 MHz</td>
</tr>
<tr>
<td>5.34800 MHz</td>
<td>5.34800 MHz</td>
</tr>
<tr>
<td>5.35850 MHz</td>
<td>5.35850 MHz</td>
</tr>
<tr>
<td>5.37300 MHz</td>
<td>5.37300 MHz</td>
</tr>
<tr>
<td>5.40500 MHz</td>
<td>5.40500 MHz</td>
</tr>
</tbody>
</table>

**For the CW and PSK modes:**
The transceiver displays the center frequency. Therefore, tune the transceiver to the specified FCC channel frequency when you operate in these modes.

<table>
<thead>
<tr>
<th>Transceiver displayed frequency</th>
<th>FCC channel center frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.33200 MHz</td>
<td>5.33200 MHz</td>
</tr>
<tr>
<td>5.34800 MHz</td>
<td>5.34800 MHz</td>
</tr>
<tr>
<td>5.35850 MHz</td>
<td>5.35850 MHz</td>
</tr>
<tr>
<td>5.37300 MHz</td>
<td>5.37300 MHz</td>
</tr>
<tr>
<td>5.40500 MHz</td>
<td>5.40500 MHz</td>
</tr>
</tbody>
</table>
3. ADVANCED SCOPE OPERATION

Spectrum Scope screen

Setting the Center Mode span
Displays signals around the operating frequency within the selected span. The operating frequency is always displayed in the center of the screen.

1. Display the SPECTRUM SCOPE screen.
   - Touch [CENT/FIX] to select the Center mode.
   - Touch [CENT/FIX] to toggle between the Center and Fixed modes.
2. Touch [SPAN] several times until the desired scope span is selected.
   - Selectable span: ±2.5, 5.0, 10, 25, 50, 100, 250 and 500 kHz

Example: Setting for ±2.5 kHz span

3. Setting the Fixed Mode range
Displays signals within a specified frequency range. The selected frequency band activity can easily be observed using this mode. Three Fixed Edge bands can be set for each amateur frequency band covered by the transceiver.

1. Display the SPECTRUM SCOPE screen.
2. Touch [CENT/FIX] to select the Fixed mode.
3. Touch [EDGE] several times until the desired Fixed Edge frequency band is selected.
   - The fixed Edge frequencies are settable (p. 41).

Example: Setting for ±2.5 kHz span

<<: The frequency is outside the lower edge.
>>: The frequency is outside the higher edge.
“Out of Range” is displayed.

Example: 14.000 MHz
Example: 14.100 MHz
Example: 14.350 MHz

4. To close the SPECTRUM SCOPE screen, push (EXIT).
3. ADVANCED SCOPE OPERATION

### Spectrum Scope screen (Continued)

**Directly selecting a frequency**
By touching or clicking on the FFT scope zone or the waterfall zone on the SPECTRUM SCOPE screen, you can directly tune your frequency on the displayed area of the band.

1. Display the SPECTRUM SCOPE screen.
2. Touch the signal spectrum on the FFT scope zone or the waterfall zone or click on a signal.
   (Example: in the Center mode)
3. If you touch the FFT scope zone or the waterfall zone, the touched area is zoomed in.

   ![Zoomed Area](image1)

   **Touch the signal in the zoomed area.**

   ![Signal Touch](image2)

   **If you click on a signal, your frequency is tuned to the signal frequency.**

   ![Frequency Tuned](image3)

   **Your frequency is tuned to the signal frequency.**

**Displaying the Dual Scope screen**
The transceiver has a Dual scope mode that simultaneously displays the Main and Sub band scopes during Dualwatch operation.

1. Display the SPECTRUM SCOPE screen.
2. Touch [DUAL].
   - Touching [DUAL] toggles between Dual scope and Single scope.
   - The selected scope is framed in orange.
   - The Sub band scope is selected.
   - Touching or clicking the scope that is not framed in orange selects the Main band scope or Sub band scope.
   - You can select the scope display type in the Dual Scope Type item.

   ![Dual Scope Display](image4)

   **Example: “Side by Side”**

   ![Dual Scope Auto Select](image5)

   **You can also set the Dual Scope Auto Select item not to change the operating band (Main/Sub) when the frequency is touched or clicked.**

4. To exit the SPECTRUM SCOPE screen, push [EXIT].

**Information**

- While right-clicking on the screen, the frequency where the cursor is located is displayed.
- By right-clicking and dragging the cursor, the frequency changes. Release to return to the originally selected frequency.
- By clicking and dragging with the cursor, the frequency changes to that where the cursor is released.

3. To exit the SPECTRUM SCOPE screen, push [EXIT].
3. ADVANCED SCOPE OPERATION

Spectrum Scope screen (Continued)

♦ Adjusting the sweep speed
Select the sweep speed to change the FFT scope refresh speed and the waterfall speed.
1. To change only the waterfall speed, select "Slow," "Mid," or "Fast" in the Waterfall Speed.
2. Display the SPECTRUM SCOPE screen.
3. Touch [SPEED] several times until the desired sweep speed is selected.
   • Selectable speeds: FAST, MID, or SLOW
   • ">>>", ">>", or ">" indicates FAST, MID, or SLOW.
   • A popup window is displayed in the center of the SPECTRUM SCOPE screen and displays the selected sweep speed for 1 second.
4. To exit the SPECTRUM SCOPE screen, push [EXIT].

♦ Adjusting the Reference level
When monitoring a weak signal that is buried in the noise floor, or monitoring a strong signal but some stronger signals are nearby, adjusting the Reference level of the screen helps you to see these signals.
• Even if this setting is changed, it does not affect the input signal level.
• When you adjust the Reference level, the signal strength for the waterfall also appears to change.
1. Display the SPECTRUM SCOPE screen.
2. Touch [<MENU1>] to display Menu 2.
3. Touch [REF].
4. Rotate [MAIN DIAL] to adjust the level.
   • Adjustable range: –30.0 dB ~ +10.0 dB
   • You can reset to ±0.0 dB by touching [DEF].
5. To exit the SPECTRUM SCOPE screen, push [EXIT].

Difference in the spectrum

If you adjust this setting to a positive level, all signal levels appear stronger.
Or, if you adjust to a negative level, all signal levels appear weaker.
3. ADVANCED SCOPE OPERATION

**SCOPE SET screen**

This Set screen is used to set the waveform color, Scope range for the Fixed mode, and so on.

1. Display the SPECTRUM SCOPE screen.
   
   ![SCOPE SET screen](image)

2. Touch [EXPD/SET] for 1 second.
3. Rotate [MAIN DIAL] to scroll through the items, and then touch the item you want to set.
   (Example: Max Hold)

4. Touch an option to set.
   (See the column to the right for details on the items.)

5. To exit the SCOPE SET screen, push [EXIT].

**TIP: How to reset to the default setting**

Touching the item or its option for 1 second displays the Quick menu, and then touch “Default” to reset the item/option to its default setting.

**Scope during Tx (CENTER TYPE)**  
(Default: ON)

Set the TX signal display to ON or OFF.

**Max Hold**  
(Default: 10s Hold)

Select the peak level holding function.

- **OFF**: Turns OFF the peak level holding function.
- **10s Hold**: Holds the peak spectrum for 10 seconds.
- **ON**: Continuously holds the peak spectrum.

**CENTER Type Display**  
(Default: Filter Center)

Select the center frequency of the SPECTRUM SCOPE screen. (Only in the Center mode)

- **Filter Center**: Displays the selected filter’s center frequency in the center of the SPECTRUM SCOPE screen.
- **Carrier Point Center**: Displays the carrier point frequency of the selected operating mode in the center of the SPECTRUM SCOPE screen.
- **Carrier Point Center (Abs. Freq.)**: In addition to the carrier point center setting above, the actual frequency is displayed at the bottom of the scope.  

**Marker Position (Fix Type)**  
(Default: Carrier Point)

Select the marker position on the SPECTRUM SCOPE screen. (Only in the Fixed mode)

- **Filter Center**: Displays the Marker on the selected filter’s center frequency.
- **Carrier Point**: Displays the Marker on the carrier point frequency of the selected operating mode.

**Averaging**  
(Default: OFF)

Set the FFT scope waveform averaging function to between 2 and 4, or OFF.

- **OFF**: The FFT scope screen refreshes on each sweep time. This setting displays the critical spectrum view.
- **2, 3, 4**: The FFT scope screen averages 2 to 4 sweeps to smoothly display the spectrum.

**Waveform Type**  
(Default: Fill)

Select the outline waveform display for the FFT scope screen.

- **Fill**: The waveform is drawn only in color.
- **Fill+Line**: The waveform is drawn in color with an outline.

39
3. ADVANCED SCOPE OPERATION

SCOPE SET screen (Continued)

Waveform Color (Current)  (Default: (R) 217 (G) 241 (B) 247)
Set the waveform color for the currently received signals.
1. Touch and select the R (Red), G (Green) or B (Blue) scale, and then rotate \( \text{MULTI} \) to adjust the level from 0 to 255.
2. The color is displayed in the box above the RGB scale.

Waveform Color (Line)  (Default: (R) 70 (G) 30 (B) 0)
Set the waveform outline color for the currently received signals.
1. Touch and select the R (Red), G (Green) or B (Blue) scale, and then rotate \( \text{MULTI} \) to adjust the level from 0 to 255.
2. The color is displayed in the box above the RGB scale.

Waveform Color (Max Hold)  (Default: (R) 58 (G) 110 (B) 147)
Set the waveform color for the received signals maximum level.
1. Touch and select the R (Red), G (Green) or B (Blue) scale, and then rotate \( \text{MULTI} \) to adjust the level from 0 to 255.
2. The color is displayed in the box above the RGB scale.

Waterfall Display  (Default: ON)
Turn the Waterfall display ON or OFF for the normal scope or Mini scope screens.
1. On the Expanded scope screen, the Waterfall is always displayed.
   • OFF: Turns OFF the Waterfall display.
   • ON: Turns ON the Waterfall display.

Waterfall Speed  (Default: Mid)
Select the Waterfall speed.
• Slow: Sets the waterfall speed to Slow.
• Mid: Sets the waterfall speed to Mid.
• Fast: Sets the waterfall speed to Fast.

Waterfall Size (Expand Screen)  (Default: Mid)
Select the Waterfall height in the Expand scope screen.
• Small: The same height as the Normal scope screen, only the FFT scope expands.
• Mid: The Waterfall height expands at the same ratio as the FFT scope.
• Large: Only the Waterfall height expands.

Waterfall Peak Color Level  (Default: Grid 10)
Select the signal level that the Waterfall displays a peak color.
Higher signal levels are Red, Yellow, Green, Light-blue, Blue and Black, in that order.
• Selection: Grid 1 ~ Grid 10

Waterfall Marker Auto-hide  (Default: ON)
Set the Waterfall Marker Auto-hide function to ON or OFF.
• OFF: The marker in the Waterfall zone stays ON.
• ON: The marker in the Waterfall zone is hidden 2 seconds after it stops in place.

Dual Scope Type  (Default: Over/Under)
When the Dual scope is selected, select the Main and Sub scope layout.
• Over/Under: Displays the Main scope over the Sub scope.
• Side by Side: Displays the Main and Sub scopes side by side.

Dual Scope Auto Select  (Default: ON)
When the Dual scope is selected, by selecting the band (MAIN or SUB) simultaneously switches the Main or Sub scope.
• OFF: The Main scope and Sub scope are not switched by selecting the Main band or Sub band.
• ON: The Main scope and Sub scope are switched by selecting the Main band or Sub band.

Continued on the next page
3. ADVANCED SCOPE OPERATION

SCOPE SET screen (Continued)

Fixed Edges

0.03 – 1.60
(Default: No. 1 0.500–1.500 MHz)
(Default: No. 2 0.500–1.500 MHz)
(Default: No. 3 0.500–1.500 MHz)

Set the Upper and Lower Edge frequencies for the Fixed mode. Three edges are assigned to each band.
• Settable range: 0.030 ~ 1.600 MHz

20.00 – 22.00
(Default: No. 1 21.000–21.450 MHz)
(Default: No. 2 21.000–21.150 MHz)
(Default: No. 3 21.150–21.450 MHz)

• Settable range: 20.000 ~ 22.000 MHz

22.00 – 26.00
(Default: No. 1 24.890–24.990 MHz)
(Default: No. 2 24.890–24.930 MHz)
(Default: No. 3 24.930–24.990 MHz)

• Settable range: 22.000 ~ 26.000 MHz

26.00 – 30.00
(Default: No. 1 28.000–29.000 MHz)
(Default: No. 2 28.000–28.200 MHz)
(Default: No. 3 28.200–29.000 MHz)

• Settable range: 26.000 ~ 30.000 MHz

30.00 – 45.00
(Default: No. 1 30.000–31.000 MHz)
(Default: No. 2 30.000–31.000 MHz)
(Default: No. 3 30.000–31.000 MHz)

• Settable range: 30.000 ~ 45.000 MHz

45.00 – 60.00
(Default: No. 1 50.000–51.000 MHz)
(Default: No. 2 50.000–50.100 MHz)
(Default: No. 3 50.100–50.300 MHz)

• Settable range: 45.000 ~ 60.000 MHz

1.60 – 2.00
(Default: No. 1 1.800–2.000 MHz)
(Default: No. 2 1.800–1.830 MHz)
(Default: No. 3 1.900–1.930 MHz)

• Settable range: 1.600 ~ 2.000 MHz

2.00 – 6.00
(Default: No. 1 3.500–4.000 MHz)
(Default: No. 2 3.500–3.575 MHz)
(Default: No. 3 3.750–3.850 MHz)

• Settable range: 2.000 ~ 6.000 MHz

6.00 – 8.00
(Default: No. 1 7.000–7.300 MHz)
(Default: No. 2 7.000–7.030 MHz)
(Default: No. 3 7.030–7.200 MHz)

• Settable range: 6.000 ~ 8.000 MHz

8.00 – 11.00
(Default: No. 1 10.100–10.150 MHz)
(Default: No. 2 10.100–10.130 MHz)
(Default: No. 3 10.130–10.150 MHz)

• Settable range: 8.000 ~ 11.000 MHz

11.00 – 15.00
(Default: No. 1 14.000–14.350 MHz)
(Default: No. 2 14.000–14.100 MHz)
(Default: No. 3 14.100–14.350 MHz)

• Settable range: 11.000 ~ 15.000 MHz

15.00 – 20.00
(Default: No. 1 18.068–18.168 MHz)
(Default: No. 2 18.068–18.110 MHz)
(Default: No. 3 18.110–18.168 MHz)

• Settable range: 15.000 ~ 20.000 MHz

1. Touch to select the upper and lower edge frequency, and then rotate MULTI or touch the key pad to edit the frequency.
4. VOICE RECORDER FUNCTIONS

Recording a QSO audio

This transceiver is equipped with a QSO recorder not only for the receive audio, but also for the transmit audio. This function is useful to make a QSO record or to confirm your QSO with a rare entity’s station or on a DXpedition. You can also use the function to repeatedly send the same message. The recorded contents are saved onto an SD card.

There are 3 ways to start recording.

- Hold down [REC] for 1 second.
- Push [QUICK] and select "REC Start."
- Push [MENU] and touch [RECORD].

The recorded audio is saved in the “Voice” folder on the SD card.

TIP: About the icons
- While recording, “●” is displayed under the clock readout and the SD card indicator next to the SD card slot blinks blue.
- While pausing, “II” is displayed.

When the PTT Automatic Recording function, “PTT Auto REC” is set to ON in RECORDER SET, the recording automatically starts when you start transmitting.

Using the [REC] key
- Hold down [REC] for 1 second to start recording.

Using the [QUICK] key
1. Push [QUICK].
2. Touch [<<REC Start>>] to start recording.

Using the MENU screen
1. Display the QSO RECORDER screen.

2. Touch “<<REC Start>>” to start recording.
- “Recording Started” is displayed for 1 second.

3. To stop recording, touch “<<REC Stop>>.”

4. To close the QSO RECORDER screen, push [EXIT].

NOTE:
- To record a QSO, an SD card (user supplied) is required.
- If your SD card does not have an “IC-7610” folder, back up any data on the SD card, insert it in the transceivers card slot and then format it using the built-in format function.
- Once the recording starts, recording will restart after the transceiver is turned OFF and ON again.
- The recording continues until you touch <<REC Stop>> or the free space on the SD card has run out.
- When the recording file’s content becomes 2 GB, the transceiver continues to record, but to a new file.
4. VOICE RECORDER FUNCTIONS

Playing back a QSO audio

You can playback the recorded QSO audio.

1. Insert the SD card in which the recorded audio is saved.
2. Display the PLAY FILES screen.
3. Select the folder that the file you want to playback is saved.
4. Select the file to play back.
   • Starts a playback.
5. To close the PLAY FILES screen, push EXIT several times.

   Recording start time and date
   The number of file
   Operating frequency, operating mode, of the Main and Sub bands.
   The TX/RX status of the recorded audio.
   Play back icon
   Play back icon
   Play back icon
   Total time
   Play back time
   Play back process
   Play the next file
   Play the previous file
   Pause/Playback
   Rewind
   Forward

   Playback continues to the next file, and stops when the last file in the folder is played back.
Playing back a recorded audio on a PC

You can also playback the voice memory data on a PC.

1. Insert the SD card into your PC.

2. Open the “Voice” folder.
3. Open the folder where the file you want to playback is saved.

4. Double-click file that you want to play back.

   - The audio starts playing back.
   - The files are titled based on the date and time (yyyymmdd_hhmmss.wav).
     (Example: 20171001_120255.wav)

**NOTE:**
- The operations while playing back may differ, depending on the application. Refer to the application’s instruction manual for details.
- When the file does not playback, after double-clicking the file, download an appropriate software.
  (Example: Windows Media® Player)
4. VOICE RECORDER FUNCTIONS

Checking the folder information and file information

You can check the folder name, size, and saved date or recorded file’s operating frequency, operating mode, date, and so on.

Checking the folder information:
1. Display the PLAY FILES screen.
   MENU » RECORD > Play Files
2. Touch a folder for 1 second.
3. Touch “Folder Information.”
   • The FOLDER INFORMATION screen is displayed.
4. To close the PLAY FILES screen, push EXIT several times.

Checking the file information:
1. Display the PLAY FILES screen.
   MENU » RECORD > Play Files
2. Touch a folder.
3. Touch a file to check its information for 1 second.
   • The QUICK MENU is displayed.
4. Touch “File Information.”
   • The FILE INFORMATION screen is displayed.
5. To close the PLAY FILES screen, push EXIT several times.
4. VOICE RECORDER FUNCTIONS

Deleting files

1. Display the PLAY FILES screen.
   MENU » RECORD > Play Files

2. Select the folder that the file you want to delete is saved.

3. Touch the file that you want to delete for 1 second.
   • The QUICK MENU is displayed.

4. Touch “Delete.”
   ① If you want to delete all files in the selected folder, touch “Delete All.”
   • “Delete File?” is displayed.

5. Touch [YES].
   • The file is deleted and returns to the previous screen.

6. To close the PLAY FILES screen, push EXIT several times.

Deleting folders

1. Display the PLAY FILES screen.
   MENU » RECORD > Play Files

2. Touch the folder you want to delete for 1 second.
   • The QUICK MENU is displayed.

3. Touch “Delete.”
   ① If you want to delete all folders, touch “Delete All Folders.”
   • “Delete Folder?” is displayed.

4. Touch [YES].
   • The folder is deleted and returns to the previous screen.

5. To close the PLAY FILES screen, push EXIT several times.
4. VOICE RECORDER FUNCTIONS

RECORD SET screen

You can change the recorder settings on this screen.

**MENU > RECORD > Recorder Set**

**REC Mode**  (Default: TX&RX)
Selects the recording mode to record a QSO audio.
- **TX&RX**: Records both the transmit and receive audio.
- **RX Only**: Records only the received audio.

**TX REC Audio**  (Default: Direct)
Selects the recording audio to transmit.
- **Direct**: Records the microphone audio.
- **Monitor**: Records the TX monitor audio.

**RX REC Condition**  (Default: Squelch Auto)
Selects the recording condition for receive.
- **Always**: Records even if no signal is received.
- **Squelch Auto**: Records only when the squelch opens.
  (The recording will be paused when the squelch closes while recording.)

**File Split**  (Default: ON)
Turns the File Split function ON or OFF.
- **OFF**: The audio is continuously recorded into the file even if you switch between transmit and receive or the squelch status changes between open and closed. When the recording file's size becomes 2 GB, the transceiver continues to record, but to a new file.
- **ON**: While recording, and if you switch between transmit and receive, or the squelch status changes between open and closed, a new file is automatically created in the same folder, and the audio is saved into the new one.

**PTT Auto REC**  (Default: OFF)
Turns the PTT Automatic Recording function ON or OFF.
- **OFF**: The recording does not start, even if a signal is transmitted.
- **ON**: The recording automatically starts when a signal is transmitted.

**The recording will stop when:**
- **10 seconds has passed without transmission after the last transmission.**
- **10 minutes has passed with no signal after the last transmission.**
  - If you receive a signal within 10 seconds after the last transmission, the received audio is also recorded.
  - If you receive another signal within 10 seconds after the last reception, the received audio is also recorded.
- **10 minutes has past while operating with the squelch is open in the SSB, CW, RTTY, or AM mode.**
- **The frequency or operating mode is changed.**
- **The operating method (V/M, M-CH, Band Stacking Register, and so on) is changed.**

**PRE-REC for PTT Auto REC**  (Default: 10sec)
Selects whether or not record the audio that is received before the PTT Automatic Recording function is activated.
- **OFF**: Does not record the audio.
- **5sec/10sec/15sec**: Records the audio that is previously received in this set period of time.

**TIP: How to reset to the default setting**
Touching the item or its option for 1 second displays the Quick menu, and then touch “Default” to reset to the default setting.
4. VOICE RECORDER FUNCTIONS

PLAYER SET screen

You can fast forward or rewind while playing back an audio file. You can change the skip time in the PLAYER SET screen.

1. Display the PLAYER SET screen.
   
   1. Display the PLAYER SET screen.

   
   MENU ➔ RECORD ➔ Player Set

2. Touch “Skip Time.”

3. Touch an option. (Example: 5 seconds)

4. To close the PLAYER SET screen, push EXIT.

TIP: How to reset to the default setting

Touching the item or its option for 1 second displays the Quick menu, and then touch “Default” to reset to the default setting.
4. VOICE RECORDER FUNCTIONS

INSTANT REPLAY SET screen

You can set the recording time and the playing back time for the Instant Replay function.

1. Display the INSTANT REPLAY SET screen.
   
   "MENU" » "RECORD > Instant Replay Set"

2. Touch the setting item. (Example: REC Time)

3. Rotate "MULTI" to set the recording time.

REC Time  
(Default: 15sec)

Set the recording time for the Instant Replay function between 5 ~ 30 seconds. The audio is saved in the built-in audio memory.

Play Time  
(Default: 5sec)

Set the play back time for the Instant Replay function between 3 ~ 10 seconds.

The Instant Replay function plays back the recorded audio in the built-in audio memory, from the last 5 seconds (default) from the time (REC) was pushed.

**TIP: How to reset to the default setting**

Touching the item or its option for 1 second displays the Quick menu, and then touch "Default" to reset to the default setting.

Instant Replay function

DIAMOND Recording the Instant Replay

The Instant Replay function records the previous 15 seconds (default) from the time when (REC) has been pushed. The audio is recorded into the built-in memory.

You can only record once, and the memory is overwritten by pushing (REC) again.

DIAMOND Playing back the Instant Replay

After recording an audio using the Instant Replay function, you can play back the last 5 seconds (default) from the time (PLAY) was pushed.

While playing back, is displayed.

Playing back all the recorded memory

After recording an audio using the Instant Replay function, you can also play back the entire memory from the top, by holding down (PLAY) for 1 second.

While playing back, is displayed.
5. VOICE TX MEMORY OPERATION

Recording a Voice TX memory

You can record up to 8 Voice transmit memories (T1 ~ T8) of up to one and a half minutes in each memory, onto an SD card. To transmit a recorded content using a Voice TX memory, first record the message, as described below.

Ι A user supplied SD card is required to use the Voice TX memory function.
Ι You can also transmit the recorded content using an external keypad.

◊ Recording
1. Display the VOICE TX screen in the SSB, AM, or FM mode.
2. Touch [REC/SET].
3. Touch “REC.”
   • The VOICE TX RECORD screen is displayed.
4. Touch “” of the TX memory.
   (Example: T1)
5. Touch and speak into the microphone without holding down [PTT] to start recording.

Information
• You can record up to one and a half minutes in each memory.
• The previously recorded content is overwritten.

Displays the input audio level
Adjust the Mic gain so that the “REC Level” meter does not reach 80%

6. Touch to stop recording.
7. To close the VOICE TX screen, push EXIT several times.

◊ Playing back
• On the selected memory’s recording screen, touch to start playing back without transmitting.
• To stop the playback, touch .

TIP: How to clear the recorded content
Touch the Voice memory for 1 second in step 4 to display the Quick menu, and then touch “Clear.”
5. VOICE TX MEMORY OPERATION

Entering a Voice TX memory name

You can assign a name to the recorded Voice memories.

1. Open the VOICE TX RECORD screen.
   *MENU* » VOICE > REC/SET > REC

2. Touch the Voice TX memory to enter the name for 1 second.
   • The selected memory needs to contain a recording.
   • Opens the QUICK MENU screen.

3. Touch “Edit Name.”
   • Opens the Name editing screen.

4. Enter a name, and then touch [ENT] to save.
   • The editing screen closes and returns to the VOICE TX RECORD screen.
   • The entered name is displayed.

5. To close the VOICE TX RECORD screen, push [EXIT].
   • The entered memory name is also displayed on the VOICE TX screen.
5. VOICE TX MEMORY OPERATION

Transmitting a Voice memory content

You can transmit the Voice TX memory contents once, or repeatedly. This is useful for transmitting your call sign, contest number or name in some contests, or repeatedly calling CQ.

Transmitting
Transmits the prerecorded contents. (p. 50)

1. Display the VOICE TX screen.

2. Touch the desired Voice TX memory key [T1] ~ [T8].
   • Transmits the recorded content once.

3. To close the VOICE TX screen, push EXIT.

When a keyboard or keypad is connected:

• You can transmit the preset contents in the Voice TX memory (T1 ~ T8) by pushing [F1] ~ [F8] on the keyboard.
  - Pushing [F1] ~ [F8] while holding down the [Shift] key repeatedly transmits the contents.

MENU » SET > Connectors > Keyboard/Mouse > Keyboard [F1]-[F8] (VOICE)

• You can transmit the contents in the Voice TX memory (T1 ~ T8) from an external device by setting the “External Keypad,” and then connecting an external keypad to [MIC] or [EXT KEYPAD] on the IC-7610.

MENU » SET > Connectors > External Keypad > VOICE
5. VOICE TX MEMORY OPERATION

Transmitting a Voice memory content (Continued)

◇ Repeatedly transmitting
1. Display the VOICE TX screen.
   
   ![Image](image1)

   2. Touch a Voice TX memory key [T1] ~ [T8] for 1 second.
      • Repeatedly transmits the recorded content.

   ![Image](image2)

   3. Repeat icon
   4. The SD card indicator located next to the card slot blinks while transmitting.

   ![Image](image3)

   Information
   • The recorded content is repeatedly transmitted for 10 minutes, unless you manually stop transmission by touching the selected memory.
   • You can set the pause interval between the repeated transmissions in the "Repeat Time" item on the VOICE TX SET screen. During this interval, the transceiver returns to receive. (p. 54)
   • After 10 minutes have passed, and all of the recorded content in the memory is transmitted, the transceiver automatically returns to receive.
   • When a signal is received in the interval between transmissions, the transceiver pauses the next transmission until the signal disappears. However, if the squelch is set to open, the transceiver repeatedly transmits after the repeat interval time expires, even signals are received.

   3. To close the VOICE TX screen, push EXIT.

TIP:
If the "DATA OFF MOD" is set to "ACC," "USB" or "LAN," Voice TX memories can not be transmitted.

MENU » SET > Connectors > MOD Input > DATA OFF MOD

◇ Adjusting the output level
1. Display the Voice TX level screen.
   
   ![Image](image4)

   2. Touch [TX LEVEL].

   ![Image](image5)

   3. Touch any Voice memory key other than [T4] or [T8], ([T1] ~ [T3] or [T5] ~ [T7])
      • The transceiver automatically transmits.
   4. To adjust the Transmit voice level for [T4] and [T8], reverse steps 2 and 3.

   ![Image](image6)

   4. While transmitting, rotate MAIN DIAL to adjust the transmit voice level.
      • Adjusting the level too high may result in over modulation, and transmit signal distortion.

   5. To close the Voice TX screen, push EXIT several times.
5. VOICE TX MEMORY OPERATION

VOICE TX SET screen

This set screen is used to set the Automatic Monitor function and the Transmit Repeat Interval.

1. Display the VOICE TX SET screen.
   MENU » VOICE > REC/SET > SET

2. Touch the setting item. (Example: Auto Monitor)

3. Select an option. (Example: OFF)
   ①See to the right for details of the setting items and their options.

4. To close the VOICE TX SET screen, push EXIT.

Auto Monitor  (Default: ON)
Turn the Automatic Monitor function for recorded audio contents transmission, ON or OFF.
   • ON: Automatically monitors the transmit audio when transmitting a recorded audio.
   • OFF: Monitors the transmit audio only when the Monitor function is ON.

Repeat Time  (Default: 5sec)
Set the repeat interval to repeat the voice transmission.
The recorded content is repeatedly transmitted at this set interval.
   • Range: 1 ~ 15 seconds

①Repeatedly transmits the recorded content for up to 10 minutes.
①After 10 minutes have passed, and all of the recorded content in the memory is transmitted, the transceiver automatically returns to receive.

TIP: How to reset to the default setting
Touching the item or its option for 1 second displays the Quick menu, and then touch “Default” to reset to the default setting.
6. SD CARD/USB FLASH DRIVE (ADVANCED)

Saving the setting data onto an SD card or USB flash drive

The Memory channels and the transceiver’s settings can be saved onto an SD card or USB flash drive. This function is convenient when:

• Copying the saved data to another IC-7610 to operate using the same data.
• Using an IC-7610 by two or more operators with their own individual settings.

1. Insert an SD card or USB flash drive.
2. Display the SAVE SETTING screen.
   - MENU » SET > SD Card > Save Setting
   - MENU » SET > USB Flash Drive > Save Setting
3. Touch “<<New File>>.”
   ①The file name is automatically set in the following format: Setyyyyymmdd_xx (yyyy: Year, mm: month, dd: day, xx: serial number).
4. To save the file with the displayed name, touch [ENT].
   ①If you want to change the name, delete the name and re-enter it, and then touch [ENT].
   • “Save file?” is displayed.
5. Touch [YES].
   • Saves the data settings.
6. To close the SET screen, push [EXIT] several times.

TIP: When you have updated the transceiver’s firmware, the “Save Form” item will be added on the setting screen. If this item is set to the earlier firmware version, the confirmation window is displayed after step 3. To save the data in the earlier firmware version, touch [YES].
Loading the saved data files onto an SD card or USB flash drive

You can load the Memory channels and transceiver’s settings from the SD card or USB flash drive to the transceiver.

This function is convenient when:
- The transceiver has “ALL” and “Select” loading options to choose from.

**TIP:** Saving the current data is recommended before loading other data into the transceiver. (p. 51)

1. Display the LOAD SETTING screen.
   - **MENU** » **SET > SD Card > Load Setting**
   - **MENU** » **SET > USB Flash Drive > Load Setting**

2. Touch the file to load.

3. Touch “Select.”
   - If you want to load all the contents on the LOAD OPTION screen, touch “ALL” and go to step 6.

4. Touch the loading options.
   - (Example: Antenna Memory)
   - “✓” is displayed left side of the selected option.
   - The Set mode settings and Memory channel contents are always loaded.

5. Touch “<<Load>>.”
   - “Load file?” is displayed.

6. Touch [YES].
   - After the loading ends, “COMPLETED! Restart the IC-7610.” is displayed.
   - When you select “REF Adjust” in step 4, “The new "REF Adjust" setting will be saved” is displayed.

7. Turn the OFF transceiver power, then turn it ON again to restart the transceiver.
Deleting a data file

Follow the steps below to delete the files you no longer need on the SD card or the USB flash drive.

**NOTE:** Deleted data from a card or flash drive cannot be recalled. Before deleting any data, back up the card data onto your PC.

1. Display the SAVE SETTING screen.
   - MENU > SET > SD Card > Save Setting
   - MENU > SET > USB Flash Drive > Save Setting

2. Touch the file to delete for 1 second.

3. Touch “Delete.”
   - “Delete file?” is displayed.
   - To delete all files, touch “Delete All.”
   - To cancel deleting, push **EXIT**.

4. Touch [YES].
5. To close the SET screen, push **EXIT** several times.

**Checking the file information**

Touch “File Information” on the QUICK MENU to display the file name, size and the saved date.
Displaying the SD card or USB flash drive information

You can display SD card or USB flash drive capacity, and the time remaining for voice recording (SD card only.)

1. Display the SD CARD or USB FLASH DRIVE screen.
   - **MENU** » **SET > SD Card**
   - **MENU** » **SET > USB Flash Drive**

2. Touch “SD Card Info” or “USB Flash Drive info.” (Example: SD Card Info)
   - Displays the card or flash drive's free space and the capacity.

3. To close the SET screen, push **EXIT** several times.
About the SD card and USB flash drive’s folders

You can easily restore data with a backup file, even if the setting data in the SD card is accidentally deleted.

◇ The SD card folder

The folder in the SD card contains the following. The USB flash drive contains the IC-7610 folder, Capture folder and the Setting folder.

- **IC-7610 folder**
  The folders created in the IC-7610 are contained in this folder.

- **Capture folder**
  The captured screen data is saved in the ‘png’ or ‘bmp’ format.

- **Decode folder**
  The RTTY and PSK decode log folders are created.

- **PSK folder**
  The transmitted or received PSK decode log data is saved in the ‘txt’ or ‘html’ format.

- **RTTY folder**
  The transmitted or received RTTY decode log data is saved in the ‘txt’ or ‘html’ format.

- **Setting folder**
  The transceiver’s setting data is saved in the ‘dat’ format.

- **Voice folder**
  The recorded QSO audio date folders are created.

- **yyyymmdd folder**
  Recorded audio files are saved in the ‘wav’ format. The folder name is automatically created in the following format: yyyymmdd (yyyy:Year, mm:month, dd:day)

- **VoiceTx folder**
  Recorded voice audio data for the Voice TX function is saved in the ‘wav’ format.

◇ USB flash drive folder
7. MEMORY OPERATION

Memory channels

The Memory mode enables you to quickly select often-used frequencies, modes and other parameters. You can change the operating frequency, mode and so on while operating in the Memory mode. You can temporarily tune all the memory channel frequencies by rotating MAIN DIAL.

<table>
<thead>
<tr>
<th>Memory channel</th>
<th>Displayed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 ~ 99</td>
<td>Regular memory channels. 1 frequency, 1 mode, 1 filter, memory name, tone settings (including tone frequencies for repeater and tone squelch) and select memory scan setting in each memory channel.</td>
</tr>
<tr>
<td>P1/P2</td>
<td>Scan Edge memory channels. 1 frequency, and 1 mode and 1 filter in each memory channel as scan edges for programmed scans.</td>
</tr>
</tbody>
</table>

Selecting a Memory channel

1. Select the Main band or Sub band. (Example: Main band)
2. Push QUICK, and then touch "VFO/MEMORY" on the Quick menu.
3. Touch [MEMORY] to select the Memory mode.
4. Select the Memory channel.

Rotating MULTI to select a channel:
Rotate MULTI until you select the Memory channel you want to use. (Example: 2)
To close the VFO/Memory screen, push EXIT.

Selecting a channel on the MEMORY screen:
Display the MEMORY screen, and then touch to select a Memory channel. (Example: 2)
• The channel is selected and automatically closes the MEMORY screen.
Entering memory channel contents

The operating frequency, operating mode, IF filter bandwidth, and so on can be entered to each memory channel. (p. 60)

**NOTE:** New content you enter will overwrite any content already in the selected memory.

1. Select the Main band or Sub band.
   (Example: Main band)
2. Push [QUICK], and then touch “VFO/MEMORY” to select the VFO mode.
3. Set the frequency, operating mode, and other parameters you want to save in memory.
4. Rotate [MULTI] to select the Memory channel to enter the contents set in step 3. (Example: 2)
   ① You cannot select the channel number when the Mini scope screen, expanded screen or dual screen is displayed.
   ② If “- - - - - - - -” is displayed next to the selected memory channel number, it is a blank channel, meaning that no contents are entered in that channel.
5. Push [QUICK], and then touch “VFO/MEMORY.”
   • The contents are entered in the selected Memory channel.

The entered contents are displayed.

① To enter another channel with the same operating mode and settings, but on a different frequency, repeat steps 4 ~ 6 after changing the frequency.
7. To close the VFO/MEMORY screen, push [EXIT].

**To edit the Memory channel contents:**
1. Select the Memory channel to edit.
2. Change the frequency and other parameters in the Memory mode.
3. Push [QUICK], and then touch “VFO/MEMORY.”
4. Touch [MW] for 1 second to overwrite onto the selected Memory channel.
7. MEMORY OPERATION

Copying the Memory channel contents

You can copy a Memory channel contents to the VFO or another memory channel.

**Copying to the VFO**
1. Select the Main band or Sub band. (Example: Main band)
2. Select the Memory mode.
3. Rotate MULTI to select the channel to be copied. (Example: Memory channel 3)

   - The copied contents are entered in the VFO mode.

5. Touch [VFO] to select the VFO mode.
6. To close the VFO/MEMORY screen, push EXIT.

**Copying to the other Memory channel**
1. Select the Main band or Sub band. (Example: Main band)
2. Select the Memory mode.
3. Rotate MULTI to select the channel to be copied. (Example: Memory channel 3)

4. Display the MEMORY screen.

5. Rotate MULTI to select the channel to write the copied contents to. (Example: Memory channel 5)
6. Touch of the selected channel.

7. Touch “Memory Write.”
   - “Write Memory?” is displayed.

8. Touch [YES].
   - The copied channel contents are entered to the selected channel.

9. To close the MEMORY screen, push EXIT.
7. MEMORY OPERATION

**Entering a memory name**

Except for the blank channels, you can assign a name to all memory channels, including scan edges. The names will be displayed along with the frequency, mode and filter number.

1. Display the MEMORY screen.
   
   
   2. Rotate \( \text{MULTI} \) to select the channel to enter a name. (Example: Memory channel 2)

3. Touch \( \text{of the selected channel.} \)

4. Touch “Edit Name.”

5. Enter a name, and then touch [ENT].
   (Example: #1DX Spot)
   \( \) Refer to page 14 for character entry.

6. To close the MEMORY screen, push \( \text{EXIT} \).

   The Memory name is not displayed when the Mini scope screen or expanded screen is displayed.
   ①You can also select not to display the Memory name on the standby screen.

   \( \text{MENU} \) » \text{SET} » \text{Display} » \text{Memory Name} \)
7. MEMORY OPERATION

Clearing a memory channel

You can clear a no-longer-used memory channel and reset it as a blank channel, except for the program channels (P1 and P2).

1. Select the Main band or Sub band.
   (Example: Main band)
2. Select the Memory mode.
3. Rotate \( \text{MULTI} \) to select the channel to clear.
   (Example: Memory channel 3)
5. To close the VFO/MEMORY screen, push [EXIT].

About the MEMORY screen

1. Memory channel number
   Displays the memory channel number.
   \( \text{①"P1" or "P2" is displayed for the Scan Edge memory channels.} \)
2. Memory select icon
   Touch this icon to set the select number “①,” “②,” “③” or OFF. See page 69 for the Select Memory scan.
   \( \text{①You can also touch the icon for 1 second to display the SELECT ALL CLEAR screen, and then select the item to reset the select number.} \)
3. Frequency/Operating mode/IF filter
   Displays the entered frequency, selected operating mode, and the IF filter.
4. Memory name
   Displays the memory name, if entered.
   \( \text{①See the previous for details.} \)
5. Memory menu
   Touch to display the MEMORY MENU.
   \( \text{①You can select between "Edit Name," "Memory Write"} \)
   \( \text{and "Memory Clear"}. \)
6. [▲] and [▼]
   Touch to scroll through the Memory channels, 6 channels at a time.

About the QUICK MENU

While selecting a memory channel with memory contents, push [QUICK] to display the QUICK MENU, where you can select “SELECT,” “Edit Name,” “Memory Write,” “Memory Clear,” and “SELECT All Clear.”
Memo Pad

There are 5 Memo Pads as the default to save frequencies and operating modes for easy write and recall. You can increase the Memo Pads to 10 in "Memopad Numbers."

The Memo Pads are separate from memory channels.

Saving the displayed contents into a Memo Pad
1. Select the Main band or Sub band. (Example: Main band)
2. Push [QUICK], then touch “VFO/MEMORY” in the Quick menu.
3. Touch [VFO] to select the VFO mode.
4. Push [MP-R] to save the displayed content.
   • A beep sounds.
   ① To save additional Pads, repeat steps 1 to 4.
   ② When you save up to the set number of Memo Pads in "Memo Pad Quantity," the oldest Memo Pad is automatically cleared to make room for the new Memo Pad.

Calling up the Memo Pads
1. Select the Main band or Sub band. (Example: Main band)
2. Push [MP-R].
   ① Pushing [MP-R] scrolls through the contents saved in the Memo Pads.

About the MEMO PAD screen
The MEMO PAD screen displays the saved contents in a list, in which you can select or delete the saved contents.

To display the MEMO PAD screen,
• Push [MP-R] for 1 second or touch [MPAD] on the MENU screen.

If you change the frequency or operating mode called up from Memo Pads, the contents are automatically updated in a temporary Pad.

<table>
<thead>
<tr>
<th>Key</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>▲/▼</td>
<td>Scrolls through the list.</td>
</tr>
<tr>
<td>DEL</td>
<td>Touch 1 second Deletes the selected Memo Pad.</td>
</tr>
<tr>
<td>DEL ALL</td>
<td>Touch 1 second Deletes all the Memo Pads.</td>
</tr>
<tr>
<td>EXPAND</td>
<td>Select to display the MEMO PAD list in a normal or larger size screen.</td>
</tr>
</tbody>
</table>
8. SCANS

Scan types

<table>
<thead>
<tr>
<th>Scan types</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFO SCAN</td>
<td>Used to detect a signal by automatically changing the frequency in the VFO mode.</td>
</tr>
<tr>
<td>Programmed scan</td>
<td>Repeatedly scans between two Scan Edge frequencies. The edge frequencies are programmable, and are preset in P1 and P2 as the default. (pp. 61, 64)</td>
</tr>
<tr>
<td>Fine Programmed scan</td>
<td>If the squelch opens while scanning, the tuning step changes to 10 Hz. This reduces the scan speed, but the transceiver keeps scanning.</td>
</tr>
<tr>
<td>MEMORY SCAN</td>
<td>Used to detect a signal by automatically scanning the memories in the Memory mode.</td>
</tr>
<tr>
<td>Memory scan</td>
<td>Repeatedly scans all entered Memory channels.</td>
</tr>
<tr>
<td>Select Memory scan</td>
<td>Repeatedly scans all or one of 3 select Memory channels.</td>
</tr>
<tr>
<td>∆F SCAN</td>
<td>Repeatedly scans within the ∆F span area.</td>
</tr>
<tr>
<td>Fine ∆F scan</td>
<td>If the squelch opens while ∆F spanning, the tuning step changes to 10 Hz. This reduces the scan speed, but the transceiver keeps scanning.</td>
</tr>
</tbody>
</table>

Preparation

◊ Squelch status
Scans work with the Main band's squelch status. Be sure to adjust the squelch level according to your operating environment.

① Normally, set [RF/SQL] to the point where noise disappears, and the TX/RX indicator goes OFF.

When the scan starts with the squelch open:
• For a Programmed scan
When the tuning step is 1 kHz or less, the scan continues until it is manually stopped— it does not pause* even if signals are detected.

*The scan pauses when the squelch is closed and then opened. The scan resumes after 10 seconds has passed when the Scan Resume function is ON. It is cancelled when the function is OFF.

When the tuning step is 5 kHz or more, the scan pauses on each step when the Scan Resume function is ON. It does not pause when the function is OFF.

• For a Memory scan
The scan pauses on each channel when the Scan Resume function is ON. The scan does not pause when the function is OFF.

When the scan starts with the squelch closed:
The scan stops when a signal is detected, regardless of the tuning step.
• When the Scan Resume function is ON, the scan pauses for 10 seconds after detecting a signal, then resumes 2 seconds after the signal disappears.
**8. SCANS**

### SCAN screen

To display the SCAN screen, push `<MENU>` and then touch `[SCAN]`.

![SCAN screen](image)

Main band: VFO mode

Main band: Memory mode

To select the VFO mode or Memory mode, push `<QUICK>` and touch "VFO/MEMORY," and then on the VFO/MEMORY screen, touch `[VFO]` or `[MEMORY]`.

<table>
<thead>
<tr>
<th>Key</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROG</td>
<td>Starts or cancels the Programmed scan.</td>
</tr>
<tr>
<td>MEMO</td>
<td>Starts or cancels the Memory scan.</td>
</tr>
<tr>
<td>∆F</td>
<td>Starts or cancels the ∆F scan</td>
</tr>
<tr>
<td>FINE</td>
<td>While Programmed scanning, touch to switch to the Fine Programmed scan. While ∆F scanning, touch to switch to the Fine ∆F scan. In the Memory mode, this key is displayed when a ∆F scan is started.</td>
</tr>
<tr>
<td>∆F SPAN</td>
<td>Touch to select the ∆F span between ±5 kHz, ±10 kHz, ±20 kHz, ±50 kHz, ±100 kHz, ±500 kHz, and ±1 MHz.</td>
</tr>
<tr>
<td>RECALL</td>
<td>Touch 1 second Recalls the frequency that was set before starting the scan in the VFO mode.</td>
</tr>
<tr>
<td>SET</td>
<td>Displays the SCAN SET screen.</td>
</tr>
<tr>
<td>SELECT</td>
<td>Touch Selects a Memory channel to set as a Select Memory channel. &quot;★1,&quot; &quot;★2,&quot; &quot;★3,&quot; and &quot;(no icon)&quot; are alternately displayed. Touch 1 second Displays the SELECT ALL CLEAR screen.</td>
</tr>
<tr>
<td>SEL No.</td>
<td>Selects the Select scan number for the Select Memory scan. Each time you touch [SEL No.], &quot;★1,&quot; &quot;★2,&quot; &quot;★3,&quot; and &quot;★1,2,3&quot; are alternately displayed.</td>
</tr>
</tbody>
</table>

### SCAN SET screen

1. Display the SCAN screen.
   
   ![SCAN SET](image)

2. Touch [SET].

3. Touch an item to set. (Example: Scan Speed)

4. Touch an option. (Example: Slow)

5. To close the SCAN SET screen, push `<EXIT>`.

**SCAN Speed**  
(Default: Fast)

Set the desired scan speed to slow or fast.
- Slow: Scan speed is slow.
- Fast: Scan speed is fast.

**SCAN Resume**  
(Default: ON)

Set the Scan Resume function to ON or OFF.
- OFF: When a signal is detected, cancels the scan.
- ON: When a signal is detected, scan pauses for 10 seconds, then resumes. Two seconds after the signal disappears, the scan resumes.

**TIP: How to reset to the default settings**

Touching an item or its option for 1 second displays the Quick menu, and then touch "Default" to reset to the default setting.
## Programmed scan

### Programmed scan and Fine Programmed scan

Repeatedly scans between two Scan Edge frequencies. The edge frequencies are preset in P1 and P2 as the default.

(P1: 0.500000 MHz / P2: 29.999999 MHz)

口袋To change the P1 and P2 Scan Edge Memory channels, see “Entering memory channel contents” (p. 61) for details.

口袋If the same frequencies are entered into P1 and P2, the Programmed scan does not start.

口袋The Fine Programmed scan is most effective in the SSB, CW, and RTTY modes.

### Programmed scan operation

1. Select the VFO mode in the Main band.
2. Select the operating mode (example: USB), tuning step (1 kHz).
3. Display the SCAN screen.

   ![SCAN Screen](image)

   - “PROGRAM SCAN” blinks while scanning.
   - You can change the operating mode and the tuning step while scanning.

4. Touch [PROG] to start the Programmed scan.

   - “PROGRAM SCAN” blinks while scanning.

5. Touch [FINE] to switch to the Fine Programmed scan.

   - “FINE PROGRAM SCAN” blinks instead of “PROGRAM SCAN.”

6. Touch [FINE] again to return to the Programmed scan.

5. To close the SCAN screen, push EXIT several times.
Memory scan

Repeatedly scans all entered Memory channels. Blank (not entered) Memory channels are skipped.

① If two or more Memory channels are not entered, the Memory scan does not start.

Memory scan operation

1. Select the Main band.
2. Display the SCAN screen.
3. Touch [MEMO] to start the Memory scan.
   ① When a signal is detected, the scan pauses according to the “SCAN Resume” setting, and then resumes.
   ② To cancel the scan, touch [MEMO] again.
4. To close the SCAN screen, push [EXIT].

Select Memory scan

Repeatedly scans all or one of 3 Select Memory channels (★1, ★2, ★3).

① If two or more Memory channels are not designated as Select Memory channels, the Select Memory scan does not start.

Setting the Select Memory channels

1. Select the Main band.
2. Display the SCAN screen.
3. Rotate [MULTI] to select memory channels to set as the Select Memory channel. (Example: ★1)
4. Touch [SELECT] to set the selected number.
   ① “★1,” “★2,” “★3,” and “(no icon)” are alternately displayed.
5. Repeat steps 3 and 4 to set more than two Memory channels.
   ① You cannot set blank channels as Select Memory channels.
   ② You can check the Select Memory channel settings on the MEMORY screen.

(Example: “★1” is set to Memory channel 1 and 3)
8. SCANS

Memory scan (Continued)

Select Memory scan operation
1. Select the Main band.
2. Display the SCAN screen.
3. Touch [MEMO] to start a regular Memory scan.
   - When a signal is detected, the scan pauses according to the “SCAN Resume” setting, and then resumes.
4. While scanning, touch [SEL No.] to select the Select Memory scan number.
   - Each time you touch [SEL No.], “★1,” “★2,” “★3,” and “★1,2,3” are alternately displayed.
     - ★1: Channels specified as ★1 are scanned.
     - ★2: Channels specified as ★2 are scanned.
     - ★3: Channels specified as ★3 are scanned.
     - ★1,2,3: Channels specified as ★1, ★2, or ★3 are scanned.
5. Touch [SELECT] to switch to the Select Memory scan.
   - Touching [SELECT] switches between the Memory scan and the Select Memory scan.
6. To cancel the scan, touch [MEMO].
7. To close the SCAN screen, push [EXIT].

Clearing all Select Memory channel settings
1. Touch [SELECT] for 1 second on the SCAN screen.
   - The SELECT ALL CLEAR screen is displayed.
2. Touch the Select Memory channel setting to clear.
8. SCANS

**ΔF scan**

**ΔF scan and Fine ΔF scan**

(Example: Span: ±10 kHz)

14.17 MHz  14.18 MHz  14.19 MHz

Repeatedly scans within the ΔF span area. The scan starts from the center frequency.

1. In fine scan (programmed or ΔF), the scan speed decreases when the squelch opens, but the transceiver keeps scanning. The scan tuning step changes to 10 Hz when the squelch opens.

**ΔF scan operation**

1. In the Main band, set the center frequency. (Example: in the VFO mode)
2. Set the operating mode and the tuning step. (Example: USB, 1 kHz)
   1. You can also change these settings while scanning.
3. Display the SCAN screen.
4. Touch [ΔF SPAN] to select the span.
   1. Options: ±5 kHz, ±10 kHz, ±20 kHz, ±50 kHz, ±100 kHz, ±500 kHz, or ±1 MHz
5. Touch [ΔF] to start the scan.
   1. When a signal is detected, the scan pauses according to the “SCAN Resume” setting, and then resumes.
   1. To cancel the scan, touch [ΔF] again.
   1. To turn the TS function to scan by the frequency step setting, touch the 100 kHz digit on the frequency readout.
6. To switch to the Fine ΔF scan, touch [FINE].
   1. The scan frequency step changes to 50 Hz.
   1. Touching [FINE] switches between the ΔF scan and the Fine ΔF scan.
7. To close the SCAN screen, push [EXIT].
9. CLOCK AND TIMERS (ADVANCED)

NTP function

The NTP (Network Time Protocol) function synchronizes the internal clock with the time management server.

To use this function, an internet connection and default gateway settings are necessary.

◇ Using the NTP Time Synchronize function
Using this function you can manually synchronize the internal clock by accessing the time management server.

1. Display the DATE/TIME screen.
   ![Date/Time Screen]

2. Touch "<<NTP TIME SYNC>>."
   ![Touching NTP TIME SYNC]

   • “NTP Time Sync. Please wait...” is displayed.
   • The transceiver starts accessing the NTP server address that is set in the “NTP Server Address” item.

3. When “Time Sync completed.” is displayed, touch [OK].
4. To close the DATE/TIME screen, push [EXIT] several times.

◇ Using the NTP function
By turning ON the NTP function, the transceiver automatically synchronizes the internal clock with the time management server.

This function is set to ON by default.

1. Display the DATE/TIME screen.
   ![Date/Time Screen]

2. Touch “NTP Function.”
   ![Touching NTP Function]

3. Select ON or OFF.
   • When ON is selected, the transceiver starts accessing the NTP server address that is set in the “NTP Server Address” item.
4. To close the DATE/TIME screen, push [EXIT] several times.
Setting the Timers

Setting the Sleep Timer
The Sleep Timer automatically turns OFF the transceiver power when the set time period has passed. You can set the timer to between 5 and 120 minutes, in 5 minute steps.

2. Touch “Sleep Timer.”
3. Rotate [MULTI] to set the sleep timer.
   (Example: 120 minutes)
4. Touch [SET] to save the setting and to start the timer.
   • The timer indicator on the [TIMER] key turns ON.
   • Approximately 10 seconds before the transceiver power turns OFF, the indicator on the key starts blinking.
   • After the transceiver turns OFF, the Sleep Timer set in step 3 is cleared.
   • To pause and resume the timer while the timer is running, push [TIMER].
5. To close the TIMER screen, push [EXIT].
9. CLOCK AND TIMERS (ADVANCED)

Setting the Daily Timer

The Daily Timer automatically turns the transceiver power ON or OFF on the set day and time.

2. Touch the timer to set (Example: 1)
3. Rotate [MULTI] scroll through the setting items, and then touch an item to select.
   - Each setting item is described on the next page.
   - You can reset to the default setting or cancel the setting by pushing [QUICK].
4. After setting the items, touch "<<Set>>" to save them.
5. To close the TIMER screen, push [EXIT].
Setting the Timers (Continued)

Daily Timer setting items

NOTE: All of the following settings are not saved until you touch "<<Set>>."

Timer Status (Default: OFF)
Select ON to start the Daily Timer, and select OFF to stop the timer.

Reservation Timer (Default: 0:00)
Set the time to automatically turn ON the transceiver power.
① To clear the setting, push [QUICK] and touch “Clear.”

Power OFF Timer (Default: --:--)
Set the time to automatically turn OFF the transceiver power.
① To clear the setting, first set the Reservation Timer time, and then push [QUICK] to select “Clear.”

NOTE: When Power OFF Timer is set to an earlier time than the Reservation Timer time, the transceiver will not be turned OFF automatically.
To automatically turn the transceiver ON and OFF, set Power OFF Timer to a later time than the Reservation Timer time.

Example:
• Reservation Timer: 8:00
• Power OFF Timer: 9:30

Reservation Channel (MAIN) (Default: -- ch)
Reservation Channel (SUB) (Default: -- ch)
The Memory channel set in this item is automatically selected when the transceiver is automatically turned ON by the Reservation Timer, or the set time has come while the transceiver is turned ON.
① You cannot select a blank channel.
① To clear the setting, push [QUICK] and touch “Clear.”

Day of the Week (Default: --)
Select a day of the week to set the Daily Timer function.
① To not to select a day, leave the item set to default, or reset to the default by pushing [QUICK] and then touch “Clear.”

Repeat Setting (Default: OFF)
Set the Repeat Setting to ON or OFF.
When this item is set to ON, the timer is activated every selected day of the week, or everyday if the Day of the Week item is not set.
① To clear the setting, push [QUICK] and touch “Clear.”

<<Set>>
Touch to save all the timer settings for the selected timer.
10. ANTENNA TUNER OPERATION (ADVANCED)

Antenna switching setting when operating with Dualwatch

You can connect a Transmit/Receive antenna to either ANT1 or ANT2 for the normal operation. However, if you want to use separate antennas for transmit and receive you need to set “RX-ANT,” or if you want to add an external device, such as a filter/pre-amplifier for receive you need to set “RX-I/O.”

To change the RX-ANT Connectors Type, touch [TYPE] on the ANTIENNA screen, then select between “Connect Receive Antenna” and “Connect External RX Device.”

MENU » ANTIENNA > TYPE

If you switch the RX-ANT Connectors Type to the opposite type, (to “Connect External RX Device” or to “Connect Receive Antenna”) the previous RX-ANT (or RX-I/O) memory settings for both the Main and Sub bands are cleared.

The “RX-I/O” settings are limited according to the antenna connector setting (ANT1 or ANT2), as follows.

Example:
When both the Main and Sub bands are using the same antenna (Example: ANT1) and the RX-ANT Connectors Type is set to “Connect External RX Device,” if the Main is set to RX-I/O, the Sub RX-I/O is forcibly set (temporarily) the same as the Main setting. Turning OFF the RX-I/O on the Sub band clears the RX-I/O settings for both the Sub and the Main bands.

If you turn OFF RX-I/O on the Sub band that was forcibly set by above operation, RX-I/O on the Main band is also forcibly turned OFF, and RX-I/O is displayed.

(Example: Main band=ANT1, Sub band=ANT2)
When the Main (ANT1) and Sub (ANT2) bands are set to different antennas, if you set RX-I/O to the Main band, and then you set RX-I/O to the Sub band, the previous Main band setting is forcibly cleared, and RX-I/O is displayed. Setting Main back to RX-I/O SUB is forcibly cleared, and RX-I/O is displayed.

The Main and Sub bands are not forcibly set or cleared when the RX-ANT Connectors Type is set to “Connect Receive Antenna.”
10. ANTENNA TUNER OPERATION (ADVANCED)

Selecting the antenna connector

Set the antenna connector to “ANT1” or “ANT2,” and turn the receive antenna connector ON or OFF.

1. Select the Main band or Sub band.
2. Select the operating band.
3. Touch [ANT] in the Multi-function key group to set to “ANT1” or “ANT2.”

When not using the [RX-ANT] connector,
Set “ANT1” or “ANT2.”

① When “ANT1/R” or “ANT2/R” is selected, the signal is switched to the [RX-ANT IN] connector, and then reception in the [ANT1] and [ANT2] are disconnected.

MENU » ANTENNA > [ANT MW]

• “★” is displayed if you temporarily select an antenna that is different from the one that is saved in memory.
  - Touch [ANT MW] for 1 second to save the temporary selection into memory, then “★” disappears.

MENU » ANTENNA > [ANT] SW

• When the antenna selection mode ([ANT] SW) is set to “Manual,” each antenna connector is selected according to the saved settings.
11. OTHER FUNCTIONS

RF Direct Sampling System

The IC-7610 employs an RF direct sampling system and has 2 completely independent and identical receiver circuits for the Main and Sub bands from the antenna to the AF output. RF signals are directly converted to digital data and processed in a Field Programmable Gate Array (FPGA) with Icom’s state of the SDR technology. The RF signals are sent to the A/D converter, resulting in digital signal, then is processed by the FPGA to be restored to an analog audio signal according to the receive mode. This system is a leading technology marking an epoch in amateur radio.

In the Direct Sampling System, there is no local oscillator or mixer circuits that are used in ordinary super heterodyne systems. That makes the received signal less distorted in the amplification stage, resulting a higher image response received signal.

In the transmit circuit, since the transmit signal is generated by the FPGA regardless of the type of emission, a pure high C/N ratio transmit signal is obtained.
About the RF/SQL Control

You can set the RF/SQL (outer) control type in the RF/SQL Control item in the set mode.

- **Auto:** While in the AM or FM mode, used only as a squelch control. While in the SSB, CW, RTTY, or PSK mode, used only as an RF gain control.
- **SQL:** Used as only a squelch control. RF gain is fixed at maximum sensitivity.
- **RF+SQL:** Used as an RF gain control, and a noise squelch or S-meter squelch.

### When using as an RF gain/squelch control
(Squelch is fixed open: SSB, CW, RTTY, PSK only)

### When using as an RF gain control
(Squelch is fixed open: SSB, CW, RTTY, PSK only)

### When using as a squelch control
(RF gain is fixed at maximum.)
About “USB SEND/Keying”

You can control transmit, receive and CW/RTTY keying from the PC, through the USB port. Select the control port to be used for communication between the IC-7610 and PC in the “USB SEND,” “USB Keying (CW)” and “USB Keying (RTTY)” items according to your operating needs.

The IC-7610 has two virtual COM ports, A and B. When connecting to a USB port on your PC, the ports are virtually named as USB1 (A) and USB1 (B), and then the transmit and receive control (USB SEND), CW Keying, or RTTY (FSK) Keying signals from the PC are assigned to the DTR/RTS terminals in the virtual port.

**USB SEND** (Default: OFF)
**USB Keying (CW)** (Default: OFF)
**USB Keying (RTTY)** (Default: OFF)

- **OFF:** Turns OFF the function.
- **USB1 (A) DTR:** Uses the DTR terminal on USB1 (A).
- **USB1 (A) RTS:** Uses the RTS terminal on USB1 (A).
- **USB1 (B) DTR:** Uses the DTR terminal on USB1 (B).
- **USB1 (B) RTS:** Uses the RTS terminal on USB1 (B).

**TIP: About the USB SEND/Keying items**

1. When you operate RTTY or CW through your PC’s USB port and your IC-7610, you may not be able to send the “SEND” or “Keying” signals until a few seconds after you connect the USB cable.
2. When you operate through your PC’s USB port and the IC-7610, and connect a second transceiver to another PC USB port, a short “SEND” or “Keying” signal will be sent from the first transceiver. Therefore, we recommend that you do not connect a second transceiver to a USB port of the same PC. Or, always turn OFF the transceiver power before you connect a USB cable.
11. OTHER FUNCTIONS

Measuring SWR

The transceiver has a high-performance SWR meter. This meter displays a stable measurement in real time, even if the transmit output power varies frequently. You can measure the SWR of an antenna itself through the internal antenna tuner.

1. Select the RTTY mode.
2. Set the frequency band for the antenna.
3. Touch the meter indicator several times to display the SWR meter.
   ○ You can also display the SWR on the Multi-function meter by touching the meter indicator for 1 second.

Before transmitting, monitor the operating frequency to make sure you will not cause interference to other stations on the same frequency.

4. Select the antenna connector that the antenna that you want to measure is connected to.
   ○ If the SWR meter indicates 1.5 or less, the antenna is matched.
   ○ If the measured SWR is more than 1.5:1, you need to match the antenna with the transceiver.
5. Push (MULTI) to adjust the RF POWER to more than 30 W in the Multi-function menu.
6. Hold down [PTT] (or push (TRANSMIT)) to transmit.
   The best match is within this range. (1.5 or less)

7. After reading the SWR, release [PTT] (or push (TRANSMIT)) to return to receive.
11. OTHER FUNCTIONS

Selecting the Display Type

You can select between 2 display backgrounds.

1. Display the DISPLAY screen.
   [MENU] » [SET] > [Display]
2. Touch “Display Type.”
3. Select the background display type from A and B.
   • A: Black background (default)
   • B: Blue background
4. To close the DISPLAY screen, push [EXIT].

Selecting the Display Font

You can select between 2 frequency readout fonts.

1. Display the DISPLAY screen.
   [MENU] » [SET] > [Display]
2. Touch “Display Font.”
3. Select the display font type from “Basic” and “Round.”
   • Basic (default)
     \underline{14.170.00} \underline{14.180.00}
   • Round
     \underline{14.170.00} \underline{14.180.00}
4. To close the DISPLAY screen, push [EXIT].

Displaying my call sign

You can set to display your own call sign at power ON.
(Example: displaying the call sign JA3YUA)

1. Display the DISPLAY screen.
   [MENU] » [SET] > [Display]
2. Touch “My Call.”
3. Enter “JA3YUA,” and touch [ENT] to save.

4. To close the DISPLAY screen, push [EXIT].
Screen Capture function

You can capture the transceiver display onto an SD card or a USB flash drive. Most of the screens used in this manual are captured using this function. However, some screens cannot be captured.

◊ Setting the Screen Capture function
1. Display the “Screen Capture [POWER] Switch” screen.
   
   "SCREEN CAPTURE View screen.

2. Touch “ON” to turn ON the Screen Capture function.
3. Touch “Screen Capture Storage Media” to select “SD Card” or “USB Flash Drive” to save the captured screens.

4. Touch “Screen Capture File Type” to set the screen capture file type to “PNG” or “BMP.”

   "Screen Capture function.

◊ Capturing a screen
1. Display the screen that you want to capture.
2. Push (POWER).
   • “SCREEN CAPTURE Completed” is displayed.
   • If the “Screen Capture Keyboard [Print Screen]” is set to ON, push [Print Screen] on the keyboard.

◊ Viewing a captured screen
1. Display the SCREEN CAPTURE VIEW screen.

   "Screen Capture function.

2. Touch the screen capture to view.
   • The indicator on the [NR] key blinks while viewing a screen capture.
   • You can view the next screen capture by rotating [MULTI].

TIP: You can also assign the Screen Capture function to the [Print Screen] key on the USB keyboard.

To display the file information or delete captured screens,
While selecting a file on the SCREEN CAPTURE VIEW screen, push (QUICK).

3. To close the SD CARD or USB FLASH DRIVE screen, push (EXIT) several times.
11. OTHER FUNCTIONS

REF adjustment

You can perform a rough frequency calibration by receiving the radio station WWV, WWVH, or other frequency signals.

**NOTE:**
- The transceiver has been adjusted and tested at the factory before being shipped out. You should not have to recalibrate.
- Before performing a frequency calibration, you have to set “Calibration Marker” to ON.
- Spurious signal waveforms may be displayed while the Calibration Marker is ON.

①Before performing a frequency calibration, set the following items as described in the table below.

<table>
<thead>
<tr>
<th>Operating mode</th>
<th>USB</th>
</tr>
</thead>
<tbody>
<tr>
<td>AF/RF/SQL</td>
<td>Decent audibility</td>
</tr>
<tr>
<td>AF/RF/SQL</td>
<td>Maximum RF gain</td>
</tr>
<tr>
<td>TWIN PBT</td>
<td>Reset by holding down for 1 second.</td>
</tr>
<tr>
<td>RIT, A TX</td>
<td>OFF (No icon)</td>
</tr>
</tbody>
</table>

1. Set the frequency to the standard frequency station minus 1 kHz.
2. If receiving WWV or WWVH (at 15.00000 MHz) as your standard frequency, set the operating frequency to 14.99900 MHz.
3. Set “Calibration Marker” to ON.
4. Select the “REF Adjust” item.
5. Rotate MULTI to adjust for a zero beat with the received standard signal.
6. “Zero beat” means that the exact same frequencies are set to 2 signals, resulting in a single tone being transmitted.
7. Set “Calibration Marker” to OFF.
8. Push EXIT several times until the MENU screen is closed.
12. MAINTENANCE (ADVANCED)

Cleaning

DO NOT use harsh solvents such as benzine or alcohol when cleaning, because they will damage the transceiver surfaces.

If the transceiver becomes dusty or dirty, wipe it clean with a dry, soft cloth.

Replacing fuse

If a fuse blows, or the transceiver stops functioning, find and repair the cause of the problem. Then replace the damaged fuse with a new, adequately rated fuse.

Spare fuses are supplied with the transceiver.

The fuses are installed in the DC power cable and in the inside circuitry, to protect the transceiver.

- DC power cable fuses: ATC 30 A
- Circuitry fuse: ATC 5 A

**WARNING!**

- Disconnect the DC power cable from the transceiver before replacing the fuse.
- **NEVER** use fuses that are not specified.

**DC power cable fuses**

See the following illustration to replace the DC power cable fuses.
Replacing fuse (Continued)

**Circuitry fuse**

1. Unscrew 2 screws to remove the carrying handle, if attached.

2. Remove the 10 top cover screws, then remove the cover.

3. Remove the 15 shield screws, then remove the shield cover.

4. Replace the circuitry fuse as shown below. **CAUTION:** When you remove a fuse, use longnose pliers to protect your fingers and the fuse holders.

5. Replace the removed parts.
12. MAINTENANCE (ADVANCED)

**Touch screen calibration function**

When no screen action occurs, or a different function is activated after touching the screen, the touched point and the detected point may be different. In that case, the Touch screen calibration function helps to correct the touch screen sensing accuracy.

1. Display the OTHERS screen.

   ![Menu > Set > Others](image)

2. Touch “Touch Screen Calibration.”
   - A dot appears on the screen.

3. Touch the dot that is displayed on the screen.
   - A new dot appears in another position.

4. Repeat step 3.
   - When the calibration is complete, the transceiver returns to the OTHERS screen.

**TIP: When the touch screen is not accurate, and you cannot access the OTHERS screen.**

Do the following steps to display the “Touch Screen Calibration” screen.

1. Turn OFF the transceiver.
2. While holding down [MENU] and [EXIT], push [POWER] to display the “Touch Screen Calibration” screen.
3. Repeat step 3 and 4 on the left column.
4. Touch the frequency readout or a key on the touch screen to confirm that the touch screen is working correctly.
13. UPDATING THE FIRMWARE

General

◊ About updating the firmware
You can update the IC-7610’s firmware using an SD card or a USB flash drive. Updating the firmware adds new functions and/or improves performance parameters.

You can download the latest firmware from the Icom website.
  http://www.icom.co.jp/world/index.html

◊ Checking the firmware version
Check the firmware version when you turn ON the transceiver.

The firmware version is displayed

TIP: You can also check the firmware version on the INFORMATION screen.

MENU » SET > Others > Information
13. UPDATING THE FIRMWARE

General (Continued)

◊ Preparation

Access the following URL and download the firmware file.

http://www.icom.co.jp/world/index.html

These instructions are based on Microsoft® Windows® 7.

1. Click [Support].

2. Click the “Firmware Updates/Software Downloads” link.

3. Click the desired firmware file link in the IC-7610 group.

4. Read “Regarding this Download Service” carefully, and then click [Agree].

5. Click “Save as” in the displayed File Download dialog.

6. Select the location where you want to save the firmware, and then click [Save] in the displayed File Download dialog.
   • The file starts downloading.
   • The firmware and the firmware utility are compressed in a “zip” format folder. Unzip it before use.

◊ Unzipping the firmware folder

1. Right-click the downloaded firmware folder (zip format).
   • Right-click menu is displayed.

2. Click “Extract All...”
   • After unzipping, a folder is created in the same location as the downloaded folder.
   ◊ In the “7610_*” folder, “7610_* .dat” is created.
     * Represents the release number.
13. UPDATING THE FIRMWARE

Updating the firmware

**IMPORTANT:** To update the firmware, first format your SD card or USB flash drive using the IC-7610. Then copy the downloaded firmware data from your PC into the IC-7610 folder on the card or flashdrive.

**CAUTION:** NEVER turn OFF the transceiver while updating the firmware. If you turn OFF the transceiver, or if a power failure occurs while updating, the transceiver firmware will be damaged and you will have to send the transceiver back to the nearest Icom distributor for repair. This type of repair is out of warranty, even if the transceiver warranty period is still valid.

**TIP:** BE SURE to unzip the downloaded file. See the previous page for details.

1. Copy the downloaded firmware data into the IC-7610 folder on an SD card or a USB flash drive.

2. Insert the SD card or USB flash drive into the transceiver.

3. Display the SD CARD or USB FLASH DRIVE screen.

   ```
   MENU » SET > SD Card
   MENU » SET > USB Flash Drive
   ```

4. Touch “Firmware Update,” and then after you read and agree with all the precautions, touch [YES].
   • The file selecting screen is displayed.

5. Touch the Firmware (Example: 7610_101).
   • The final confirmation screen is displayed.
   ① Carefully read all the displayed precautions.

Continued on the next page.
13. UPDATING THE FIRMWARE

Updating the firmware (Continued)

6. After you read and agree with all the precautions, touch [YES] for 1 second.
   • The updating starts.

7. Follow the instructions on the transceiver screen.
   ① The IC-7610 reads the firmware file from the SD card or USB flash drive and writes it to the main CPU, sub CPU, front CPU, and FPGA.
   ② Downloading and loading status are displayed in the dialogs.

8. When the update is completed, “Firmware updating has completed.” is displayed in the dialog.
   • The IC-7610 will automatically restart.
   ① After the updating finishes, the operating screen is displayed.
INDEX

\[\Delta F\] scan ........................................................................... 71
Fine \[\Delta F\] scan................................................................. 71
Operation................................................................. 71
\[\Delta TX\] function......................................................... 12
\[\Delta TX\] monitor function........................................... 12

A
About the 5 MHz frequency band operation........... 37
Auto Monitor ................................................................. 54

B
Band Edge Beep ........................................................... 5
Band Beep Edges, Entering........................................... 5
Band Edge, Inserting.................................................. 6
Deleting a Band Edge.................................................... 7
Entering a new Band Edge........................................... 7
Band Edges Beep
Resetting all band edges to presets....................... 8

C
Calibration Marker ........................................................ 84
Cleaning ........................................................................... 85
Clock................................................................. 72
Connecting
AH-740, connecting.................................................. 4

Connection
137 kHz band operation ........................................... 1
RC-28 ........................................................................... 2

Connections
FSK, AFSK, PSK connections..................................... 3
CW
About the CW Reverse mode ..................................... 13
Contest number menu (001 SET)............................... 15
Count up trigger........................................................ 14
Count Up Trigger (Contest number).......................... 15
Dop/Dash Ratio ........................................................ 16
Keyer memory edit menu (EDIT)............................... 14
Keyer Repeat time..................................................... 16
Keyer set menu (CW-KEY SET)................................. 16
Key Type ................................................................. 16
MIC Up/Down Keyer ................................................... 16
Number Style (Contest number)............................... 15
Operating CW........................................................ 13
Paddle Polarity ........................................................ 16
Present Number (Contest number)............................ 15
Rise Time ................................................................. 16
Side Tone Level ........................................................ 16
Side Tone Level Limit ................................................ 16
Using the Memory Keyer function (KEYER)............. 13

D
Data mode (AFSK) operation ..................................... 36
Display Font.............................................................. 82
Display Type ............................................................ 82
Drive Gain level
Adjusting the Drive Gain level............................. 9

F
File Split......................................................................... 47
Firmware
Checking the version ................................................... 88
Updating ...................................................................... 90
Firmware updating
Preparation.............................................................. 89

FM repeater
Checking the repeater input signal......................... 34
Checking the repeater tone frequency...................... 34
Setting the repeater tone frequency......................... 33
FM repeater operation ............................................... 33
FPGA......................................................................... 78
Fuse........................................................................... 85
Circuitry ................................................................. 85, 86
DC power cable ....................................................... 85
Replacing ................................................................. 85

I
Instant Replay function ............................................. 49
Playing back .............................................................. 49
Recording ................................................................. 49
INSTANT REPLAY SET screen................................. 49

M
Memo Pad ..................................................................... 65
Calling up ................................................................. 65
Saving ......................................................................... 65
Memory channel ...................................................... 60
Clearing ....................................................................... 64
Copying contents....................................................... 62
Copying to other channel ......................................... 62
Copying VFO ............................................................ 62
Entering contents ....................................................... 61
Memory name .......................................................... 63
MEMORY screen ...................................................... 64
Selecting ................................................................. 60
Memory scan
Operation.............................................................. 69
My call sign ............................................................. 82

P
PLAYER SET screen .................................................... 48
Playing back (QSO)....................................................... 43
On a PC ................................................................. 44
Play Time ................................................................. 49
PRE-REC for PTT Auto REC .................................... 47
Programmed scan
Fine Programmed scan ........................................... 68
Operation .............................................................. 68
PSK
AFC/NET function .................................................... 26
Editing a PSK memory .............................................. 29
Operating PSK ........................................................ 25
PSK DECODE screen .............................................. 25
PSK decoding............................................................ 26
QPSK mode operation ............................................. 26
Setting the PSK Automatic TX/RX function ........... 28

92
INDEX

Transmitting a PSK memory content ............................................ 27
Turning ON the PSK log .................................................................. 30
Vector tuning indicator .................................................................. 25

PSK decode log
AFC Range ..................................................................................... 32
FFT Scope Averaging ...................................................................... 32
FFT Scope Waveform Color .......................................................... 32
Font Color ......................................................................................... 32
Log File Type ..................................................................................... 30
PSK Decode Log setting ................................................................... 31
Time Stamp .......................................................................................... 32
Time Stamp (Frequency) ................................................................. 32
Time Stamp (Time) ............................................................................. 32
Viewing the PSK log contents ........................................................ 31

PTT Auto REC ................................................................................ 47

REC Mode ......................................................................................... 47
RECORER SET screen .................................................................... 47
Recording (QSO) ................................................................................. 42
Using the MENU screen .................................................................. 42
Using the [QUICK] key ...................................................................... 42
Using the [REC] key .......................................................................... 42

REC Time ............................................................................................. 49
REF Adjust ........................................................................................ 84
Repeat Time ......................................................................................... 54
RF Control .......................................................................................... 79
RF Direct Sampling System ............................................................... 78

RTTY
Editing an RTTY memory ................................................................ 21
Log File Type ..................................................................................... 22
Operating RTTY (FSK) .................................................................... 17
RTTY Automatic TX/RX function ..................................................... 20
RTTY Decode Log setting ................................................................. 23
RTTY DECODE screen ...................................................................... 18
RTTY decoding .................................................................................. 18
Transmitting an RTTY memory content ........................................... 19
Turning ON the RTTY log ................................................................. 22
Twin Peak Filter (TPF) .................................................................... 18
Viewing the RTTY log contents ........................................................ 23

RTTY decode log
Auto CR+LF by TX ........................................................................... 24
Decode New Line Code .................................................................... 24
Decode USOS ....................................................................................... 24
Diddle ................................................................................................. 24
FFT Scope Averaging ...................................................................... 24
FFT Scope Waveform Color ............................................................ 24
Font Color .......................................................................................... 24
Time Stamp ......................................................................................... 24
Time Stamp (Frequency) ................................................................. 24
Time Stamp (Time) ............................................................................. 24
TX USOS ............................................................................................. 24
RX REC Condition ............................................................................ 47

S
Scan .................................................................................................. 66
Fine \(\Delta f\) scan ................................................................. 66, 71
Fine Programmed scan ................................................................. 66
\(\Delta f\) scan ....................................................................................... 66, 71
Memory scan .................................................................................. 66, 69
Preparation ....................................................................................... 66
Programmed scan ........................................................................... 66, 68
Select Memory scan ....................................................................... 66, 69
Squelch status .................................................................................. 66
VFO scan ........................................................................................... 66

SCAN Resume .................................................................................... 67
SCAN screen ..................................................................................... 67
SCAN SET screen ............................................................................. 67
SCAN Speed ....................................................................................... 67
Scope set screen ................................................................................ 39
Averaging ......................................................................................... 39
Center type display .......................................................................... 39
Dual scope auto select ..................................................................... 40
Dual scope type ............................................................................... 40
Fixed edges ....................................................................................... 41
Marker position ................................................................................ 39
Max hold ............................................................................................ 39
Scope during Tx ............................................................................... 39
Waterfall display ............................................................................. 40
Waterfall marker auto-hide ............................................................. 40
Waterfall peak color level ............................................................... 40
Waterfall size (expand screen) ........................................................ 40
Waterfall speed ............................................................................... 40
Waveform color (current) ............................................................... 40
Waveform color (line) ..................................................................... 40
Waveform color (max hold) ............................................................. 40
Waveform Type ............................................................................... 39

Screen Capture function ................................................................. 83
SD card ............................................................................................... 55
Deleting ............................................................................................. 57
Folders ............................................................................................... 59
Information, displaying ................................................................. 58
Loading ............................................................................................... 56
Saving ................................................................................................. 55

Select Memory scan
Operation ......................................................................................... 70
Setting the Select Memory channels .............................................. 69

Spectrum scope
Center mode, setting ................................................................. 36
Directly selecting a frequency ........................................................ 37
Dual scope screen, displaying ....................................................... 37
Fixed mode range, setting ............................................................. 36
Reference level, adjusting .............................................................. 38
Sweep spee., adjusting ................................................................. 38

SQL Control ...................................................................................... 79
SWR ................................................................................................. 81
INDEX

T
Timers.................................................................73
  Daily timer ..................................................74
  Daily timer setting items ............................75
  Sleep timer ................................................73
Tone squelch operation ..................................35
  Checking another station's tone frequency ......35
Touch screen calibration function ....................87
Tracking function ..........................................10
Transverter operation ..................................36
  Transverter setting example ........................36
TX REC Audio ................................................47

U
USB flash drive ................................................55
  Deleting ....................................................57
  Folders .....................................................59
  Information, displaying ...............................58
  Loading ....................................................56
  Saving .....................................................55
USB Keying (CW) ...........................................80
USB Keying (RTTY) .........................................80
USB SEND ....................................................80
USB SEND/Keying .........................................80

V
Voice Recorder function ..................................42
  Checking the file information .......................45
  Checking the folder information ..................45
  Deleting files ............................................46
  Deleting folders .......................................46
Voice TX memory
  Adjusting the output level ..........................53
  Entering a name ........................................51
  Playing back ............................................50
  Recording ...............................................50
  Repeatedly transmitting .............................53
  Transmitting ..........................................52
VOICE TX SET screen .....................................54

VOX function ................................................11
  Adjusting the VOX function .......................11
  DELAY ......................................................11
  Turning ON the VOX function ......................11
  VOICE DELAY ...........................................11
  VOX GAIN .................................................11