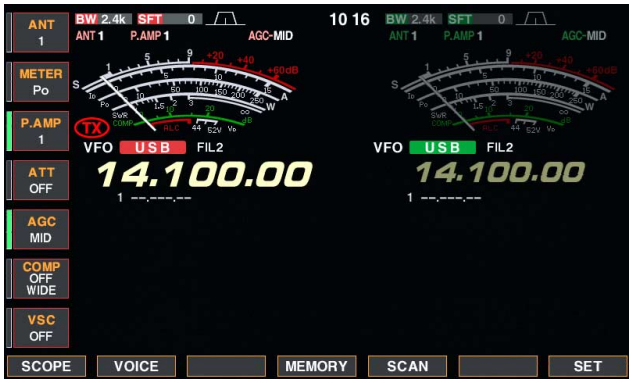
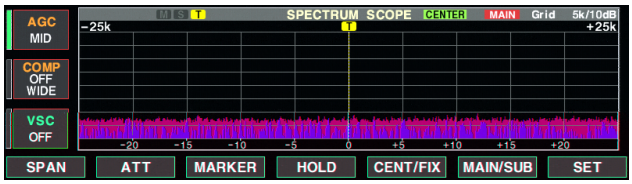
■ Screen menu arrangement

The following screens can be selected from the start up screen. Choose the desired screen using the following chart.

Pushing [EXIT/SET] several times returns to the start up screen. See p. 12-3 for set mode arrangement.

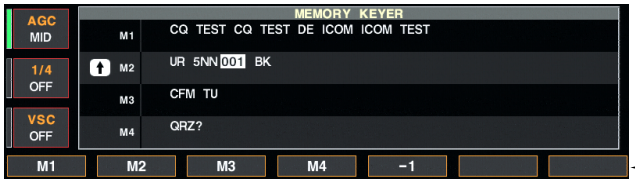


• **Spectrum scope screen** (p. 5-2)



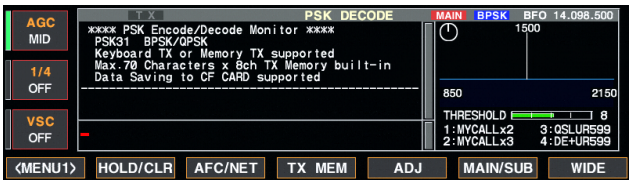
• **Voice recorder screen** (p. 7-3)

• **Memory keyer screen** (CW mode; p. 4-8)

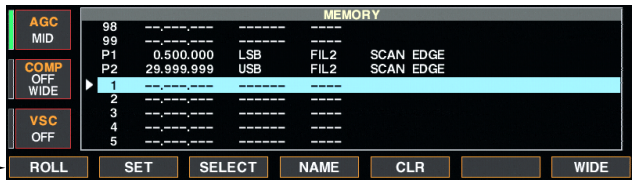


• **RTTY decoder screen** (p. 4-13)

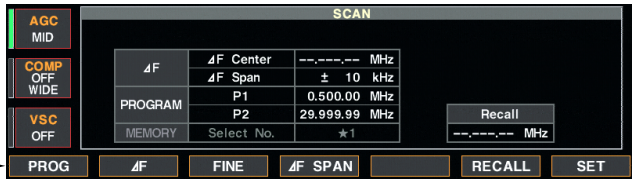
• **PSK31 decoder screen** (p. 4-21)



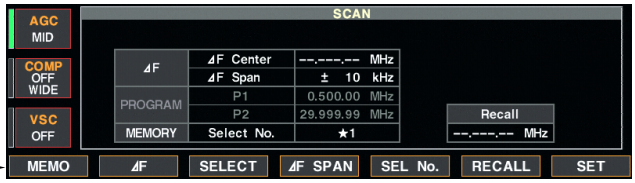
• **Memory channel screen** (p. 8-3)



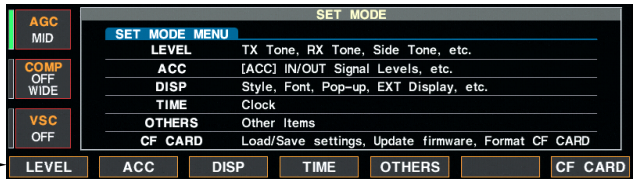
• **Scan screen** (VFO mode; p. 9-4)



• **Scan screen** (Memory mode; p. 9-6)



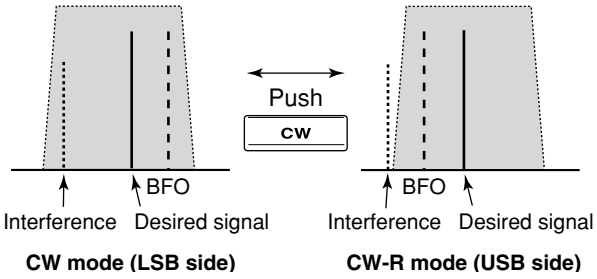
• **Set mode menu screen** (p. 12-2)



◇ Convenient functions for transmit

• **Break-in function** (p. 6-3)
➥ Push [VOX/BK-IN] several times to select the break-in OFF, semi break-in and full break-in.
• "BK IN" or "F-BK IN" appears when the semi break-in or full break-in function is ON, respectively.

◇ About CW reverse mode

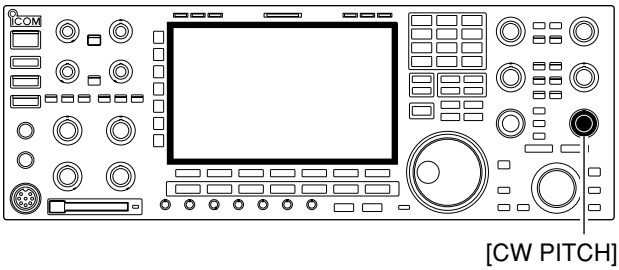


CW-R (CW Reverse) mode uses the opposite side band to receive CW signals.

Use when interfering signals are near a desired signal and you want to use CW-R to reduce the interference.

➥ During CW mode, push [CW] to select CW and CW-R mode.

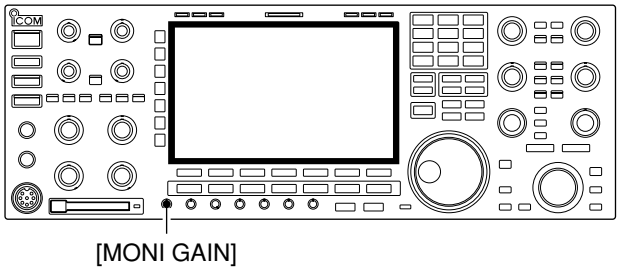
◇ About CW pitch control



The received CW audio pitch and CW side tone can be adjusted to suit your preference (from 300 to 900 Hz in 5 Hz steps). This does not change the operating frequency.

➥ Rotate [CW PITCH] to suit your preference.
• Adjustable within 300 to 900 Hz in 25 Hz steps.

◇ CW side tone function



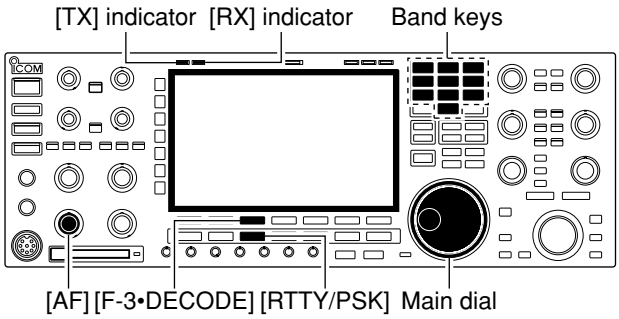
When the transceiver is in the receive condition (and the break-in function is OFF— p. 6-3) you can listen to the CW side tone without actually transmitting.

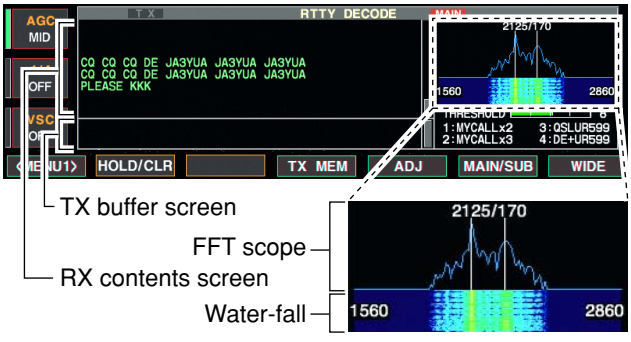
This allows you to match your transmit frequency exactly to another station's by matching the audio tone. You can also use the CW side tone (be sure to turn OFF break-in!) to practice CW sending. CW side tone level can be adjusted with [MONI GAIN].

■ Operating RTTY (FSK)

A DSP-based high-quality Baudot RTTY encoder/decoder is built-in to the IC-7800. When connecting a PC keyboard (p. 2-6), RTTY operation can be performed without an external RTTY terminal, TNC or PC.

If you would rather use your RTTY terminal or TNC, consult the manual that comes with the RTTY terminal or TNC.





① Push a band key to select the desired band.
② Push [RTTY/PSK] to select RTTY.
- After RTTY mode is selected, push [RTTY/PSK] for 1 sec. to toggle between RTTY and RTTY-R modes.
- "RTTY" or "RTTY-R" appears.

③ Push [F-3•DECODE] to display the decoder screen.
- The IC-7800 has a built-in Baudot decoder.

④ To tune the desired signal, aim for a symmetrical wave form and ensure the peak points align with the mark (2125 Hz) and shift (170 Hz) frequency lines in the FFT scope.
- The S-meter indicates received signal strength when signal is received.

⑤ Press [F12] on the connected keyboard to transmit.
- [TX] indicator lights red.

⑥ Type from the keyboard to enter the contents that you want to transmit.
- The typewritten contents are indicated in the TX buffer screen and transmitted immediately.
- The text color will be changed when transmitted.
- Press one of [F1]–[F8] to transmit the TX memory contents.

⑦ Press [F12] on the keyboard to return to receive.

✔ For your convenience

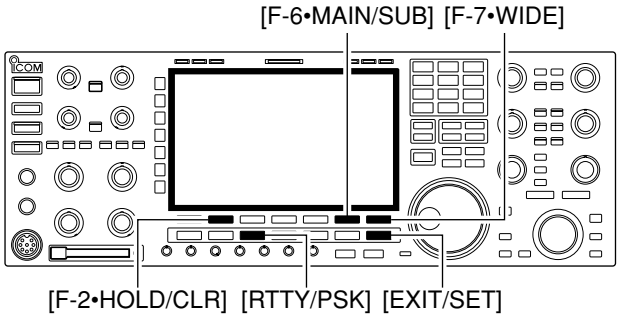
The transmission contents can be typed before being transmitted.

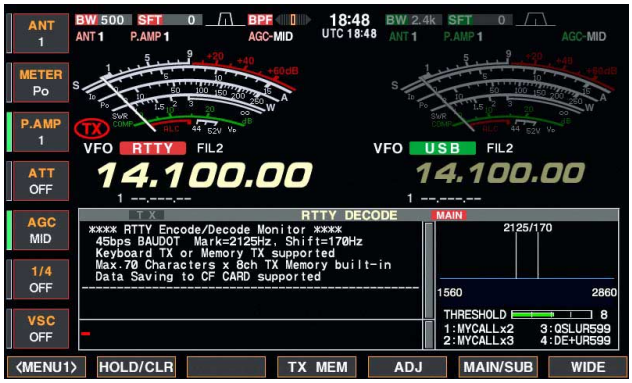
① Perform the steps ① to ④ above.
② Type from the connected keyboard to enter the message that you want to transmit.
- The typewritten contents are indicated in the TX buffer screen.

③ Press [F12] of the connected keyboard to transmit the typewritten contents.
- The color of displayed text, in the TX buffer screen, will be changed when transmitted.
- To cancel the transmission, press [F12] twice.

④ Press [F12] of the keyboard to return to receive.

◇ Functions for the RTTY decoder indication





• Wide screen indication

① Push a band key to select the desired band.
② Push [RTTY/PSK] to select RTTY.
- After RTTY mode is selected, push [RTTY/PSK] for 1 sec. to toggle between RTTY and RTTY-R modes.
- "RTTY" or "RTTY-R" appears.

③ Push [F-3•DECODE] to display the decoder screen.
- When tuned into an RTTY signal, decoded characters are displayed in the RX contents screen.

④ Push [F-2•HOLD/CLR] to freeze the current screen.
- "HOLD" appears while the function is in use.
- Push [F-2•HOLD/CLR] again to release the function.

⑤ Push [F-2•HOLD/CLR] for 1 sec. to clear the displayed characters.
- "HOLD" indicator disappears at the same time when the hold function is in use.

⑥ Push [F-7•WIDE] to toggle the RTTY decode screen size from normal and wide.
- S/RF meter type during wide screen indication can be selected in display set mode. (pgs. 3-11, 12-11)

⑦ Push [F-6•MAIN/SUB] to toggle the MAIN and SUB band for decode operation.
- Dualwatch function (p. 5-16) should be ON when SUB band is selected for decode operation.

⑧ Push [EXIT/SET] to close the RTTY decode screen.

◇ Setting the decoder threshold level

Adjust the RTTY decoder threshold level if some characters are displayed when no signal is received.

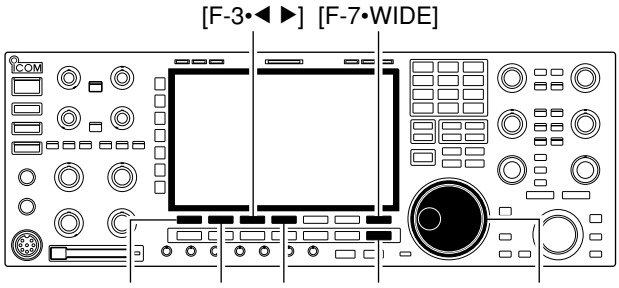
① Select the RTTY decoder screen as described above.
② Push [F-5•ADJ] to select the threshold level setting condition.
③ Rotate the main dial to adjust the RTTY decoder threshold level.
- Push [F-6•DEF] for 1 sec. to select the default setting.

④ Push [F-5•ADJ] to exit from the threshold level setting condition.

The UnShift On Space (USOS) function and new line code can be set in the RTTY set mode. (p. 4-18)

◇ RTTY decode set mode

This set mode is used to set the decode USOS function, time stamp setting, etc.



• RTTY decode set mode screen

• Setting contents

① During RTTY mode operation, push [F-3•DECODE] to select RTTY decode screen.
② Push [F-1•<MENU2>] to select RTTY decode menu 2, then push [F-6•SET] to select RTTY decode set mode.
  • Push [F-7•WIDE] to toggle the screen size from normal and wide.
③ Push [F-1•▲] or [F-2•▼] to select the desired set item.
④ Set the desired condition using the main dial.
  • Push [F-4•DEF] for 1 sec. to select a default condition or value.
  • Push [F-3•◄ ►] to select the set contents for some items.
⑤ Push [EXIT/SET] to exit from set mode.

RTTY FFT Scope Averaging — OFF

Set the FFT scope waveform averaging function from 2 to 4 and OFF. (default: OFF)

Recommendation!
If you use the FFT scope waveform for tuning, use the default or smaller number setting is recommended.

RTTY FFT Scope Waveform Color — 51 153 255

Set the color for the FFT scope waveform.
• The color is set in RGB format.
• The set color is indicated in the box beside the RGB scale.

• Push [F-3•◄ ►] to select R (Red), G (Green) and B (Blue), and then rotate the main dial to set the ratio from 0 to 255.

RTTY Decode USOS — ON

Turn the letter code decoding after receiving a “space” (USOS; UnShift On Space function) capability ON and OFF.

• ON : Decode as letter code.
• OFF : Decode as character code.

RTTY Decode New Line Code — CR,LF,CR+LF

Selects the new line code of the internal RTTY decoder.
CR: Carriage Return, LF: Line Feed

• CR,LF,CR;LF : Makes new line with any codes.
• CR+LF : Makes new line with CR+LF code only.

RTTY Diddle — BLANK

Selects the diddle condition.

• BLANK : Transmits blank code during no code transmission.
• LTRS : Transmits letter code during no code transmission.
• OFF : Turns the diddle function OFF.

◇ RTTY decode set mode (continued)

RTTY TX USOS — ON

Explicitly inserts the FIGS character even thought it is not required by the receiving station.

- ON : Inserts FIGS.
- OFF : Does not insert FIGS.

RTTY Time Stamp — ON

Turn the time stamp (date, transmission or reception time) indication ON and OFF.

- ON : Displays the time stamp.
- OFF : No time stamp indication.

RTTY Auto CR+LF by TX — ON

Selects the automatic new line code (CR+LF) transmission capability.

- ON : Transmits CR+LF code once.
- OFF : Transmits no CR+LF code.

RTTY Time Stamp (Time) — Local

Selects the clock indication for time stamp usage.

NOTE: The time won't be displayed when "OFF" is selected in "RTTY Time Stamp" as above.

- Local : Selects the time that set in "Time (Now)."
- UTC* : Selects the time that set in "CLOCK2."

*The name of choice may differ according to "CLOCK2 Name" setting (p, 11-2). "UTC" is the default name of CLOCK2.

RTTY Time Stamp (Frequency) — OFF

Selects the operating frequency indication for time stamp usage.

NOTE: The frequency won't be displayed when "OFF" is selected in "RTTY Time Stamp" as above.

- ON : Displays the operating frequency.
- OFF : No operating frequency display.

RTTY Font Color (Receive) — 128 255 128

Set the text color for received characters.

- The color is set in RGB format.
- The set color is indicated in the box beside the RGB scale.
- Push [F-3•◀ ▶] to select R (Red), G (Green) and B (Blue), and then rotate the main dial to set the ratio from 0 to 255.

RTTY Font Color (Transmit) — 255 106 106

Set the text color for transmitted characters.

- The color is set in RGB format.
- The set color is indicated in the box beside the RGB scale.
- Push [F-3•◀ ▶] to select R (Red), G (Green) and B (Blue), and then rotate the main dial to set the ratio from 0 to 255.

RTTY Font Color (Time Stamp) — 0 155 189

Set the text color for time stamp indication.

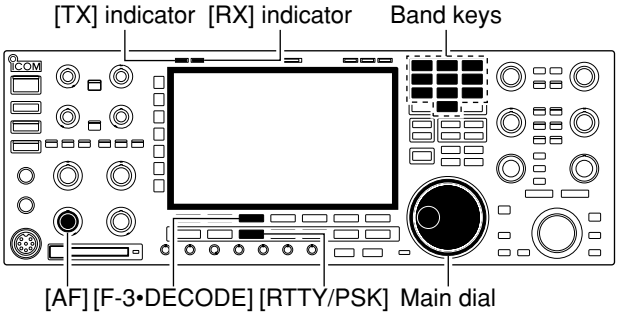
- The color is set in RGB format.
- The set color is indicated in the box beside the RGB scale.
- Push [F-3•◀ ▶] to select R (Red), G (Green) and B (Blue), and then rotate the main dial to set the ratio from 0 to 255.

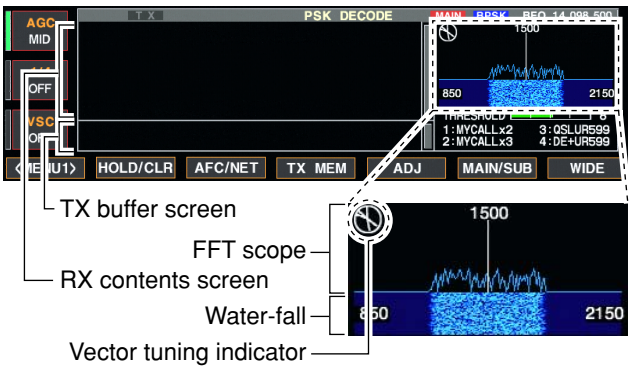
RTTY Font Color (TX Buffer) — 255 255 255

Set the text color in the TX buffer screen.

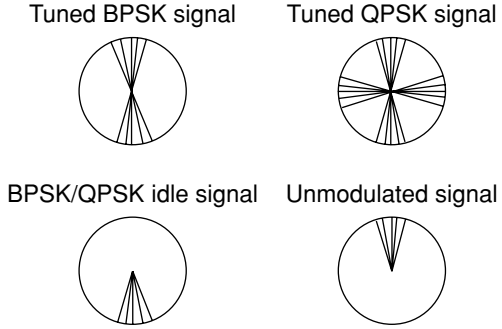
- The color is set in RGB format.
- The set color is indicated in the box beside the RGB scale.
- Push [F-3•◀ ▶] to select R (Red), G (Green) and B (Blue), and then rotate the main dial to set the ratio from 0 to 255.

■ Operating PSK





• Vector tuning indicator indication example



A high-quality DSP-based PSK31 encoder/decoder is built-in to the IC-7800. When connecting a PC keyboard (p. 2-6), PSK31 operation can be performed without PSK software installed on your PC.

If desired, you can also use your PSK software; consult the manual that comes with the software.

① Push a band key to select the desired band.
② Push [RTTY/PSK] to select PSK.
- After PSK mode is selected, push [RTTY/PSK] for 1 sec. to toggle between PSK and PSK-R modes.
- "PSK" or "PSK-R" appears.

③ Push [F-3•DECODE] to displays the decoder screen.
- The IC-7800 has a built-in PSK31 decoder.

④ Tune the desired signal with the main dial.
- The signal is properly tuned when the radiated lines in the vector tuning indicator narrow, as show in the example below.
- The radiated lines in the vector tuning indicator may be displayed sporadically.
- When a PSK signal is received, the water-fall display is activated.
- The water-fall display shows the signal condition within the passband and a vertical line appears when a PSK signal is received.

⑤ Press [F12] of the connected keyboard to transmit.
- [TX] indicator lights red.

⑥ Type from the connected keyboard to enter the message that you want to transmit.
- The typewritten contents are indicated in the TX buffer screen and transmitted immediately.
- The text color will be changed when transmitted.
- Press one of [F1]–[F8] to transmit the TX memory contents.

⑦ Press [F12] of the keyboard to return to receive.

✔ For your convenience

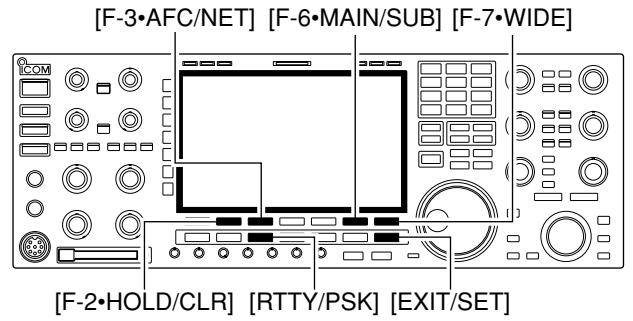
The transmission contents can be typed before being transmitted.

① Perform the steps ① to ④ above.
② Type from the connected keyboard to enter the message that you want to transmit.
- The message is shown in the TX buffer screen.

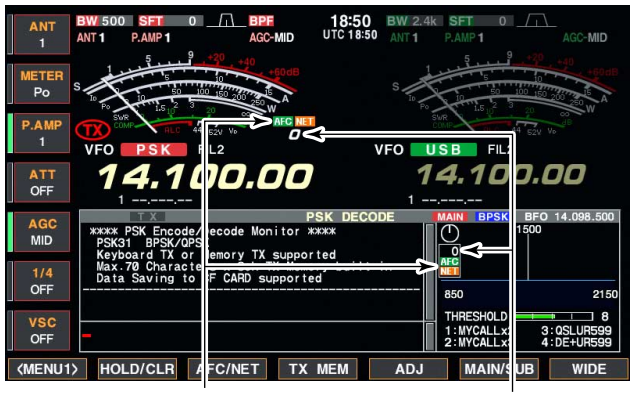
③ Press [F12] of the connected keyboard to transmit the message.
- The color of displayed text, in the TX buffer screen, will be changed when transmitted.
- To cancel the transmission, press [F12] twice.

④ Press [F12] of the keyboard to return to receive.

◇ Functions for the PSK decoder indication



• AFC/NET indications



① Push a band key to select the desired band.
② Push [RTTY/PSK] to select PSK.
- After PSK mode is selected, push [RTTY/PSK] for 1 sec. to toggle between PSK and PSK-R modes.
- "PSK" or "PSK-R" appears.

③ Push [F-3•DECODE] to display the decoder screen.
- When tuned into a PSK signal, decoded characters are displayed in the RX contents screen.

④ Push [F-2•HOLD/CLR] to freeze the current screen.
- "HOLD" appears while the function is in use.
- Push [F-2•HOLD/CLR] again to release the function.

⑤ Push [F-2•HOLD/CLR] for 1 sec. to clear the displayed characters.
- "HOLD" indicator disappears at the same time when the hold function is in use.

⑥ Push [F-3•AFC/NET] to turn the AFC function ON.
- "AFC" appears.
- If a PSK signal is received within the AFC tuning range, the decoder automatically tunes into the signal and the offset frequency is displayed.
- The AFC tuning range is set to ±15 Hz as the default. Optional ±8 Hz setting is available in PSK decode set mode. (p. 2)

NOTE: The AFC function may not tune the signal properly when a weak PSK signal is received.

⑦ Push [F-3•AFC/NET] again to turn the NET function ON.
- "NET" appears additionally.

⑧ Push [F-3•AFC/NET] for 1 sec. to add the offset frequency to the displayed frequency.
⑨ Push [F-7•WIDE] to toggle the PSK decode screen size from normal and wide.
- S/RF meter type during wide screen indication can be selected in display set mode. (pgs. 3-11, 12-11)

⑩ Push [F-6•MAIN/SUB] to toggle the MAIN and SUB band for decode operation.
- Dualwatch function (p. 5-16) should be ON when SUB band is selected for decode operation.

⑪ Push [EXIT/SET] to close the PSK decode screen.

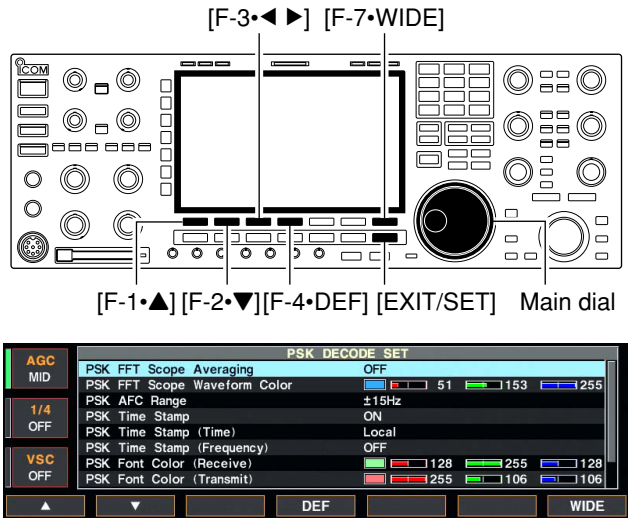
◇ Setting the decoder threshold level

Adjust the PSK decoder threshold level if some characters are displayed when no signal is received.

① Call up the PSK decoder screen as described above.
② Push [F-5•ADJ] to select the threshold level setting condition.
③ Rotate the main dial to adjust the PSK decoder threshold level.
- Push [F-6•DEF] for 1 sec. to select the default setting.

④ Push [F-5•ADJ] to exit from the threshold level setting condition.

◇ PSK decode set mode



This set mode is used to set the decode USOS function, time stamp setting, etc.

• Setting contents

① During PSK mode operation, push [F-3•DECODE] to select PSK decode screen.
② Push [F-1•<MENU2>] to select PSK decode menu 2, then push [F-6•SET] to select PSK decode set mode.
- Push [F-7•WIDE] to toggle the screen size from normal and wide.

③ Push [F-1•▲] or [F-2•▼] to select the desired set item.
④ Set the desired condition using the main dial.
- Push [F-4•DEF] for 1 sec. to select a default condition or value.
- Push [F-3•◄ ►] to select the set contents for some items.

⑤ Push [EXIT/SET] to exit from set mode.

PSK FFT Scope Averaging — OFF

Set the FFT scope waveform averaging function from 2 to 4 and OFF. (default: OFF)

Recommendation!
If you use the FFT scope waveform for tuning, using the default or smaller number setting is recommended.

PSK FFT Scope Waveform Color — 51 153 255

Set the color for the FFT scope waveform.
- The color is set in RGB format.
- The set color is indicated in the box beside the RGB scale.

- Push [F-3•◄ ►] to select R (Red), G (Green) and B (Blue), and then rotate the main dial to set the ratio from 0 to 255.

PSK AFC Range — ±15Hz

Select the AFC (Automatic Frequency Control) function operating range from ±15 Hz (default) and ±8 Hz.

NOTE: The AFC function may not tune the signal properly when a weak PSK signal is received.

PSK Time Stamp — ON

Turn the time stamp (date, transmission or reception time) display ON and OFF.

- ON : Displays the time stamp.
- OFF : No time stamp display.

PSK Time Stamp (Time) — Local

Selects the clock display for time stamp usage.

NOTE: The time won't be displayed when "OFF" is selected in "PSK Time Stamp" as above.

- Local : Selects the time that set in "Time (Now)."
- UTC* : Selects the time that set in "CLOCK2."
  *The name of choice may differ according to "CLOCK2 Name" setting (p, 11-2). "UTC" is the default name of CLOCK2.

◇ PSK decode set mode (continued)

PSK Time Stamp (Frequency) OFF

Selects the operating frequency display for time stamp usage.

- ON : Displays the operating frequency.
- OFF : No operating frequency display.

NOTE: The frequency won't be displayed when "OFF" is selected in "PSK Time Stamp" as below left.

PSK Font Color (Receive) 128 255 128

Set the text color for received characters.

- The color is set in RGB format.
- The set color is indicated in the box beside the RGB scale.
- Push [F-3•◀ ▶] to select R (Red), G (Green) and B (Blue), and then rotate the main dial to set the ratio from 0 to 255.

PSK Font Color (Transmit) 255 106 106

Set the text color for transmitted characters.

- The color is set in RGB format.
- The set color is indicated in the box beside the RGB scale.
- Push [F-3•◀ ▶] to select R (Red), G (Green) and B (Blue), and then rotate the main dial to set the ratio from 0 to 255.

PSK Font Color (Time Stamp) 0 155 189

Set the text color for time stamp indication.

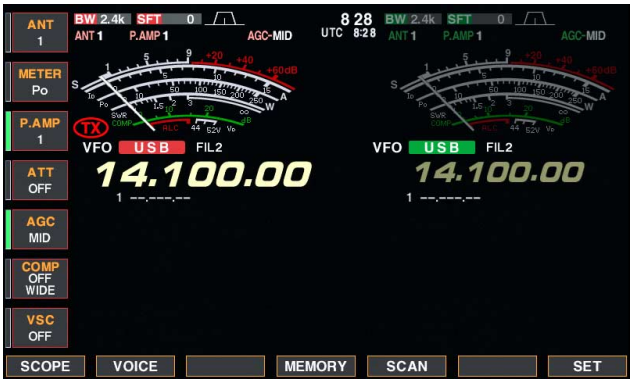
- The color is set in RGB format.
- The set color is indicated in the box beside the RGB scale.
- Push [F-3•◀ ▶] to select R (Red), G (Green) and B (Blue), and then rotate the main dial to set the ratio from 0 to 255.

PSK Font Color (TX Buffer) 255 255 255

Set the text color in the TX buffer screen.

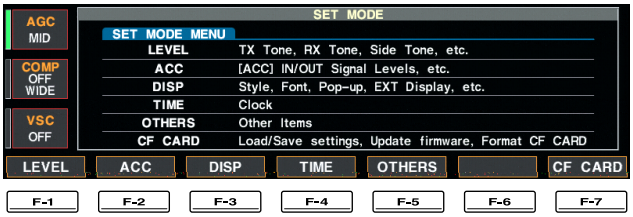
- The color is set in RGB format.
- The set color is indicated in the box beside the RGB scale.
- Push [F-3•◀ ▶] to select R (Red), G (Green) and B (Blue), and then rotate the main dial to set the ratio from 0 to 255.

◇ Screen arrangement

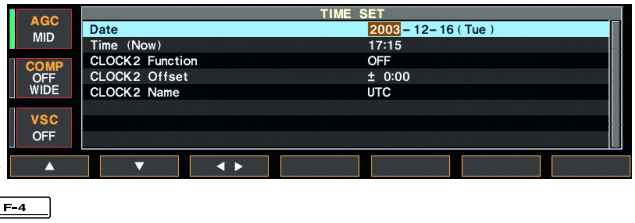


• **Display set mode** (p. 12-11)

• **Set mode menu screen** (p. 12-2)



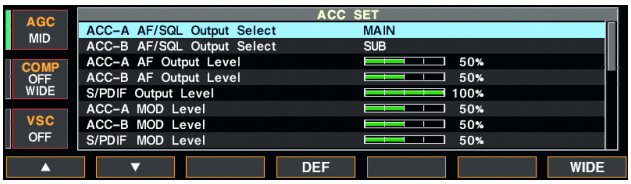
• **Time set mode** (p. 11-2)



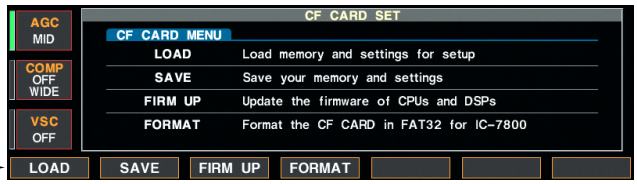
• **Level set mode** (p. 12-4)

• **Miscellaneous (Others) set mode** (p. 12-14)

• **ACC set mode** (p. 12-6)



• **CF card set menu** (p. 12-22)



■ Level set mode (continued)

FM RX Tone (Bass) 0

Sets the bass level of the receive audio tone in FM mode from –5 to +5. (default: 0)

FM RX Tone (Treble) 0

Sets the treble level of the receive audio tone in FM mode from –5 to +5. (default: 0)

SSB TBW (WIDE) 100 - 2900

Sets the transmission passband width to wide setting by changing the lower and higher cut-off frequencies.

Lower freq. : 100 (default), 200, 300 and 500 Hz
Higher freq.: 2500, 2700, 2800 and 2900 Hz (default)

SSB TBW (MID) 300 - 2700

Sets the transmission passband width to middle setting by changing the lower and higher cut-off frequencies.

Lower freq. : 100, 200, 300 (default) and 500 Hz
Higher freq.: 2500, 2700 (default), 2800 and 2900 Hz

SSB TBW (NAR) 500 - 2500

Sets the transmission passband width to narrow setting by changing the lower and higher cut-off frequencies.

Lower freq. : 100, 200, 300 and 500 Hz (default)
Higher freq.: 2500 (default), 2700, 2800 and 2900 Hz

Speech Level 50%

Sets the voice synthesizer audio output level from 0 to 100% in 1% steps. (default: 50%)

Side Tone Level 50%

Sets the side tone output level from 0 to 100% in 1% steps. (default: 50%)

Side Tone Level Limit ON

Turns the side tone output level limiting capability from ON and OFF. (default: ON)

Beep Level 50%

Sets the key-touch beep output level from 0 to 100% in 1% steps. (default: 50%)

Beep Level Limit ON

Turns the key-touch beep output level limiting capability from ON and OFF. (default: ON)

■ Display set mode

LCD Unit Bright  50%

Adjusts the LCD unit brightness from 0 (dark) to 100% (bright) range in 1% steps. (default: 50%)

Backlight (Switches)  80

Adjusts the switch indicators brightness from 1 (dark) to 100 (bright) range in 1 steps. (default: 80)

Display Type A

Selects the desired display type from A, B and C. (default: A)

Display Font Italic (1)

Selects the desired font for frequency readout from Italic (1), Italic (2), Italic (3), Italic (4), Round (1), Round (2), Round (3), Shadow (1), Shadow (2), Shadow (3), Qubic (1), Qubic (2), Qubic (3), Qubic (4), IC-780 (1), IC-780 (2), IC-780 (3) and IC-780 (4). (default: Italic (1))

Meter Response MID

Set meter needle response from SLOW, MID and FAST. (default: MID)

This setting is effective for the standard and edgewise meter type selections only.

Text Font Normal

Selects the desired font for the displays other than frequency readout from Normal and Slim. (default: Normal)

Meter Type (Normal Screen) Standard

Selects the desired S/RF meter type during normal screen indication from Standard, Edgewise and Bar. (default: Standard)

Meter Type (Wide Screen) Edgewise

Selects the desired S/RF meter type during wide screen or mini scope indication from Edgewise and Bar. (default: Edgewise)

Meter Peak Hold (Bar) ON

Turns the meter peak hold function ON and OFF. (default: ON)
This function is used for the bar meter only.

■ Display set mode (continued)

Memory Name — ON

Sets the memory name indication, during memory mode operation, ON and OFF. (default: ON)

- ON : The programmed memory name is displayed above the frequency indication.
- OFF : No memory name is displayed even a memory name is programmed.

APF-Width Popup (APF OFF→ON) — ON

Selects the pop-up display for the APF filter width from ON and OFF.
(default: ON)

MN-Q Popup (MN OFF→ON) — ON

Turns the pop-up indication capability when the notch filter width is changed from ON to OFF.
(default: ON)

Screen Saver Function — 60min

Turns the screen saver function ON (15, 30 or 60 minutes) and OFF. (default: 60 min.)

The screen saver will acts when no operation is performed for the selected time period to protect the LCD from the “burn-in” effect.

Screen Saver Type — Bound

Selects the screen saver type from “Bound,” “Rotation” and “Twist.” (default: Bound)

The screen saver indication can be displayed for your reference while pushing and holding [F-5•PREVIEW].

External Display — OFF

Select “ON” when the external display is connected.
(default: OFF)

- At least 800×600 pixel resolution is required for the display.

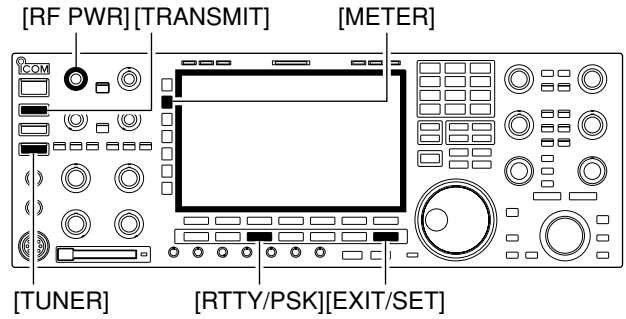
External Display Sync Pulse — H

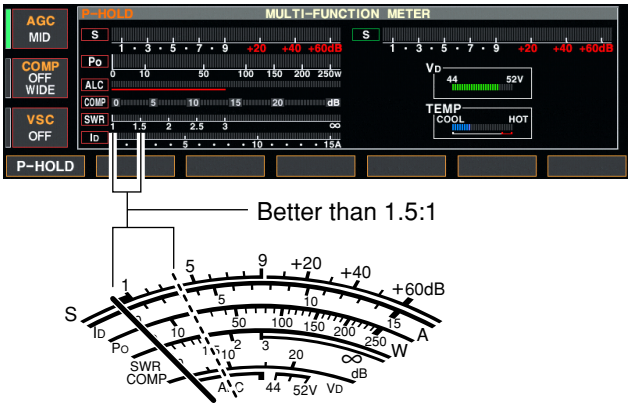
Selects the suitable pulse level for the connected external display from H and L. (default: H)

Opening Message — ON

Turns the opening message screen indication capability ON and OFF. (default: ON)

■ SWR reading





The SWR meter indicates the SWR over the transmission line in all modes.

① Push [TUNER] to turn the antenna tuner OFF.
② Push [METER] for 1 sec. to display multi-function meter.
③ Push [RTTY/PSK] once or twice to select RTTY mode.
④ Push [TRANSMIT].
⑤ Rotate [RF PWR] clockwise past the 12 o'clock position for more than 30 W output power.
⑥ Read the SWR on the SWR meter gage.
⑦ Push [EXIT/SET] to close multi-function meter.

The built-in antenna tuner matches the transmitter to the antenna when the SWR is lower than 3 : 1.

■ Screen type and font selections

• Screen image example— type C

3 types of screen images and 18 types of frequency readout indication fonts are available in the IC-7800.

① Push [EXIT/SET] several times to close multi-function screen, if necessary.
② Push [F-7•SET] to select set mode menu screen.
③ Push [F-3•DISP] to enter display set mode.
④ Push [F-1•▲] or [F-2•▼] to select "Display Type" item when selecting the screen image, select "Display Font" when selecting the frequency readout indication font.
⑤ Rotate the main dial to select the desired screen image or font.
  • Screen image is selectable from A, B and C.
  • Italic (1)/(2)/(3)/(4), Round (1)/(2)/(3), Shadow (1)/(2)/(3), Qubic (1)/(2)/(3)/(4) and IC-780 (1)/(2)/(3)/(4) are available for the frequency readout font.
⑥ Push [EXIT/SET] twice to exit from display set mode.

◇ Command table

Command	Sub command	Description
00	—	Send frequency data
01	Same as command 06	Send mode data
02	—	Read band edge frequencies
03	—	Read operating frequency
04	—	Read operating mode
05	—	Set operating frequency
06	00	Select LSB
	01	Select USB
	02	Select AM
	03	Select CW
	04	Select RTTY
	05	Select FM
	07	Select CW-R
	08	Select RTTY-R
	12	Select PSK
	13	Select PSK-R
07	—	Select VFO mode
	B0	Exchange main and sub bands
	B1	Equalize main and sub bands
	C0	Turn the dualwatch OFF
	C1	Turn the dualwatch ON
	D0	Select main band
	D1	Select sub band
08	—	Select memory mode
	0001–0101*	Select memory channel *P1=0100, P2=0101
09	—	Memory write
0A	—	Memory to VFO
0B	—	Memory clear
0E	00	Scan stop
	01	Programmed/memory scan start
	02	Programmed scan start
	03	⊿F scan start
	12	Fine programmed scan start
	13	Fine ⊿F scan start
	22	Memory scan start
	23	Select memory scan start
	A1–A7	Set ⊿F scan span (A1=±5 kHz; A2=±10 kHz; A3=±20 kHz; A4=±50 kHz; A5=±100 kHz; A6=±500 kHz; A7=±1 MHz)
	B0	Set as non-select channel
	B1	Set as select channel (1=★1; 2=★2; 3=★3; when no data command is specified, the previously set number or "★1" is selected)
	B2	Set the number for select memory scan (0=ALL; 1=★1; 2=★2; 3=★3)
	D0	Set scan resume OFF
	D3	Set scan resume ON
0F	00	Turn the split function OFF
	01	Turn the split function ON
10	00	Select 10 Hz (1 Hz) tuning step
	01	Select 100 Hz tuning step
	02	Select 1 kHz tuning step
	03	Select 5 kHz tuning step
	04	Select 9 kHz tuning step
	05	Select 10 kHz tuning step
	06	Select 12.5 kHz tuning step
	07	Select 20 kHz tuning step
	08	Select 25 kHz tuning step

Command	Sub command	Description
11	—	Select/read attenuator (0=OFF; 1=3 dB; 2=6 dB; 3=9 dB; 4=12 dB; 5=15 dB; 6=18 dB; 7=21 dB)
12	00 + RX ANT	Select/read ANT1 selection (00=RX ANT OFF; 01=RX ANT ON)
	01 + RX ANT	Select/read ANT2 selection (00=RX ANT OFF; 01=RX ANT ON)
	02 + RX ANT	Select/read ANT3 selection (00=RX ANT OFF; 01=RX ANT ON)
	03 + RX ANT	Select/read ANT4 selection (00=RX ANT OFF; 01=RX ANT ON)
13	00	Announce with voice synthesizer (00=all data; 01=frequency and S-meter level; 02=receive mode)
	01	
	02	
14	01 + Level data	[AF] level setting (0=max. CCW to 255=max. CW)
	02 + Level data	[RF] level setting (0=max. CCW to 255=11 o'clock)
	03 + Level data	[SQL] level setting (0=11 o'clock to 255=max. CW)
	05 + Level data	[APF] level setting (0=Pitch–550 Hz, 128=Pitch, 255=Pitch+550 Hz; 10 Hz steps)
	06 + Level data	[NR] level setting (0=min. to 255=max.)
	07 + Level data	Inside [TWIN PBT] setting or IF shift setting (0=max. CCW, 128=center, 255=max. CW)
	08 + Level data	Outside [TWIN PBT] setting (0=max. CCW, 128=center, 255=max. CW)
	09 + Level data	[CW PITCH] setting (0=300 Hz, 128=600 Hz, 255=900 Hz; 5 Hz steps)
	0A + Level data	[RF POWER] setting (0=max. CCW to 255=max. CW)
	0B + Level data	[MIC] setting (0=max. CCW to 255=max. CW)
	0C + Level data	[KEY SPEED] setting (0=max. CCW to 255=max. CW)
	0D + Level data	[NOTCH] setting (0=low freq. to 255=high freq.)
	0E + Level data	[COMP] setting (0=max. CCW to 255=max. CW)
	0F + Level data	[DELAY] setting (0=max. CCW to 255=max. CW)
	11 + Level data	[AGC] control setting (0=max. CCW to 255=max. CW)
	12 + Level data	[NB] control setting (0=max. CCW to 255=max. CW)
	13 + Level data	[DIGI-SEL] setting (0=max. CCW to 255=max. CW)
	14 + Level data	[DRIVE] setting (0=max. CCW to 255=max. CW)
	15 + Level data	[MONI GAIN] setting (0=max. CCW to 255=max. CW)
	16 + Level data	[VOX GAIN] setting (0=max. CCW to 255=max. CW)
	17 + Level data	[ANTI VOX] setting (0=max. CCW to 255=max. CW)
	18 + Level data	[CONTRAST] setting (0=max. CCW to 255=max. CW)
	19 + Level data	[BRIGHT] setting (0=max. CCW to 255=max. CW)

◇ Command table (continued)

Command	Sub command	Description
1A	050134	Send/read voice memory short play time (3=3 sec. to 10=10 sec.)
	050135	Send/read voice memory normal record time (5= 5 sec. to 15=15 sec.)
	050136	Send/read contest number style (0=Normal, 1=190→ANO, 2=190→ANT, 3=90→NO, 4=90→NT)
	050137	Send/read count up trigger channel (1=M1, 2=M2, 3=M3, 4=M4)
	050138	Send/read present number (1–9999)
	050139	Send/read CW keyer repeat time (1=1 sec. to 60=60 sec.)
	050140	Send/read CW keyer dot/dash ratio (28=1:1:2.8 to 45=1:1:4.5)
	050141	Send/read rise time (0=2 msec., 1=4 msec., 2=6 msec., 3=8 msec.)
	050142	Send/read paddle polarity (0=Normal, 1=Reverse)
	050143	Send/read keyer type (0=Straight, 1=Bug-key, 2=ELEC-Key)
	050144	Send/read mic. up/down keyer set (0=OFF, 1=ON)
	050145	Send/read RTTY decode USOS (0=OFF, 1=ON)
	050146	Send/read RTTY decode new line code (0=CR,LF,CR+LF, 1=CR+LF)
	050147	Send/read RTTY diddle (0=OFF, 1=Blank, 2=Letter)
	050148	Send/read RTTY TX USOS (0=OFF, 1=ON)
	050149	Send/read RTTY auto CR+LF by TX (0=OFF, 1=ON)
	050150	Send/read RTTY time stamp set (0=OFF, 1=ON)
	050151	Send/read clock selection for time stamp (0=Local time, 1=Clock 2)
	050152	Send/read frequency stamp (0=OFF, 1=ON)
	050153	Send/read received text font color (see p. 14-10 for details)
	050154	Send/read transmitted text font color (see p. 14-10 for details)
	050155	Send/read time stamp text font color (see p. 14-10 for details)
	050156	Send/read text font color in TX buffer (see p. 14-10 for details)
	050157	Send/read PSK time stamp set (0=OFF, 1=ON)
	050158	Send/read clock selection for time stamp (0=Local time, 1=Clock 2)
	050159	Send/read frequency stamp (0=OFF, 1=ON)
	050160	Send/read received text font color (see p. 14-10 for details)
	050161	Send/read transmitted text font color (see p. 14-10 for details)
	050162	Send/read time stamp text font color (see p. 14-10 for details)
	050163	Send/read text font color in TX buffer (see p. 14-10 for details)

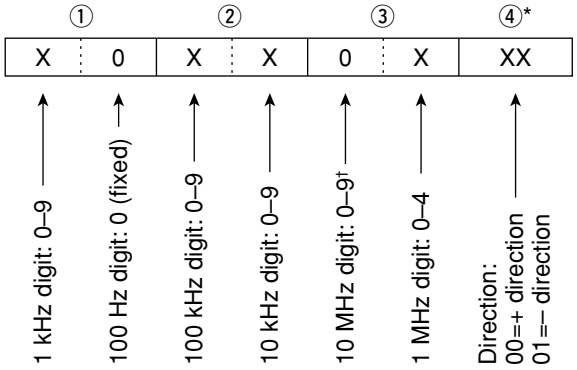
Command	Sub command	Description
1A	050164	Send/read scan speed (0=Low, 1=High)
	050165	Send/read scan resume (0=OFF, 1=ON)
	050166	Send/read antenna selection for 0.03 to 1.60 MHz band (see p. 14-10 for details)
	050167	Send/read antenna selection for 1.60 to 2.00 MHz band (see p. 14-10 for details)
	050168	Send/read antenna selection for 2.00 to 6.00 MHz band (see p. 14-10 for details)
	050169	Send/read antenna selection for 6.00 to 8.00 MHz band (see p. 14-10 for details)
	050170	Send/read antenna selection for 8.00 to 11.00 MHz band (see p. 14-10 for details)
	050171	Send/read antenna selection for 11.00 to 15.00 MHz band (see p. 14-10 for details)
	050172	Send/read antenna selection for 15.00 to 20.00 MHz band (see p. 14-10 for details)
	050173	Send/read antenna selection for 20.00 to 22.00 MHz band (see p. 14-10 for details)
	050174	Send/read antenna selection for 22.00 to 26.00 MHz band (see p. 14-10 for details)
	050175	Send/read antenna selection for 26.00 to 30.00 MHz band (see p. 14-10 for details)
	050176	Send/read antenna selection for 30.00 to 45.00 MHz band (see p. 14-10 for details)
	050177	Send/read antenna selection for 45.00 to 60.00 MHz band (see p. 14-10 for details)
	050178	Send/read antenna temporary memory set (0=OFF, 1=ON)
	050179	Send/read antenna selection (0=OFF, 1=Manual, 2=Auto)
	050180	Send/read usage for ANT2 (0=OFF, 1=TX/RX)
	050181	Send/read usage for ANT3 (0=OFF, 1=TX/RX)
	050182	Send/read usage for ANT4 (0=OFF, 1=TX/RX, 2= RX)
	050183	Send/read VOX delay (0=0.0 sec. to 20=2.0 sec.)
	050184	Send/read VOX voice delay (0=OFF, 1=Short, 2=Long)
	050185	Send/read NB depth (0=1 to 9=10)
	050186	Send/read NB width (0=0 to 255=255)
	050187	Send/read screen saver set (0=OFF, 1=15 min., 2=30 min., 3=60 min.)
	050188	Set/read screen saver type (0=Bound, 1=Rotation, 2=Twist)
	050189	Set/read meter response setting (0=SLOW, 1=MID, 2=FAST)

◇ Command table (continued)

Command	Sub command	Description
1A	050190	Set/read FFT scope averaging set for RTTY decoder (0=OFF, 1=2, 2=3, 3=4)
	050191	Set/read FFT scope waveform color set for RTTY decoder (see p. 14-10 for details)
	050192	Set/read FFT scope averaging set for PSK decoder (0=OFF, 1=2, 2=3, 3=4)
	050193	Set/read FFT scope waveform color set for PSK decoder (see p. 14-10 for details)
	050194	Set/read PSK AFC function tuning range (0=±8 Hz, 1=±15 Hz)
	06	Send/read DATA mode with filter set (see p. 14-10 for detail)
	07	Send/read SSB transmit bandwidth (0=WIDE, 1=MID, 2=NAR)
	08	Send/read DSP filter shape (0= sharp, 1= soft)
	09	Send/read roofing filter set (0=6 kHz, 1=15 kHz)
	0A	Send/read manual notch width (0=Wide, 1=Mid., 2=Nar.)
	10	Send/read lock function set (0=OFF, 1=ON)
1B	00	Set/read repeater tone frequency (see p. 14-10 for details)
	01	Set/read TSQL tone frequency (see p. 14-10 for details)
1C	00	Set/read the transceiver's condition (0=Rx; 1=Tx)
	01	Set/read antenna tuner condition (0=OFF, 1=ON, 2=Start tuning or while tuning)

◇ Offset frequency setting

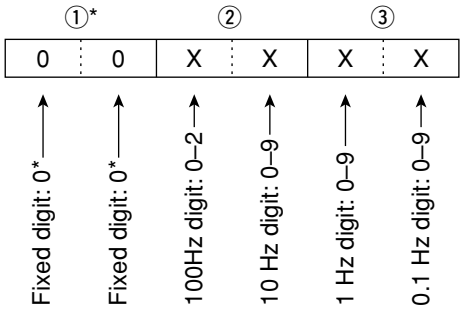
The following data sequence is used when sending or reading the offset frequency setting.



*No need to enter for transverter offset frequency setting.
†Transverter offset only; Fix to '0' for split offset setting.

◇ Repeater tone/tone squelch frequency setting

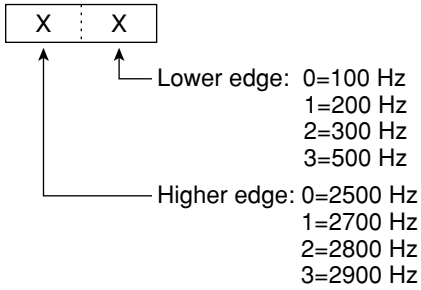
The following data sequence is used when sending or reading the tone frequency setting.



*Not necessary when setting a frequency.

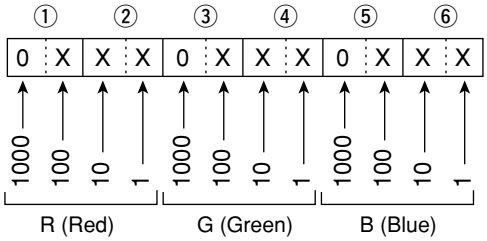
◇ SSB transmission passband width setting

The following data sequence is used when sending or reading the SSB transmission passband width setting.



◇ Color setting

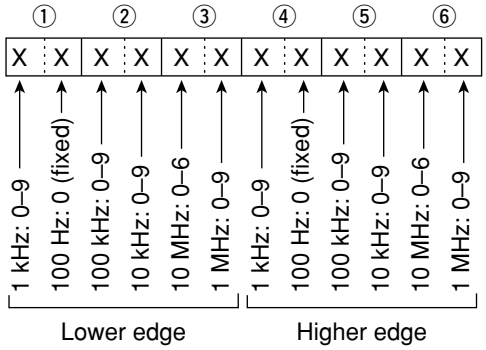
The following data sequence is used when sending or reading the color setting.



Using 0000–0255 for each color element.

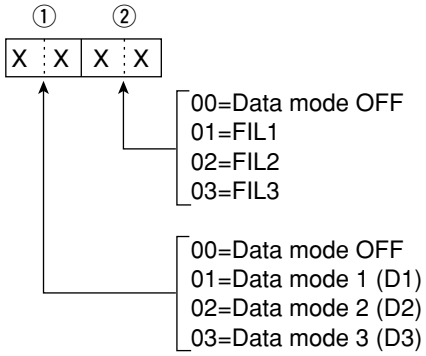
◇ Bandscope edge frequency setting

The following data sequence is used when sending or reading the bandscope edge frequency setting.



◇ Data mode with filter width setting

The following data sequence is used when sending or reading the data mode with filter width setting.



◇ Antenna memory setting

The following codes are used when sending or reading the antenna memory setting.
0=ANT1, 1=ANT2, 2=ANT3, 3=ANT4,
4*=TX: ANT1, RX: ANT4, 5*=TX: ANT2, RX: ANT4,
6*=TX: ANT3, RX: ANT4

*RX should be selected for ANT4