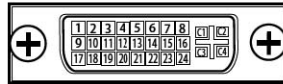


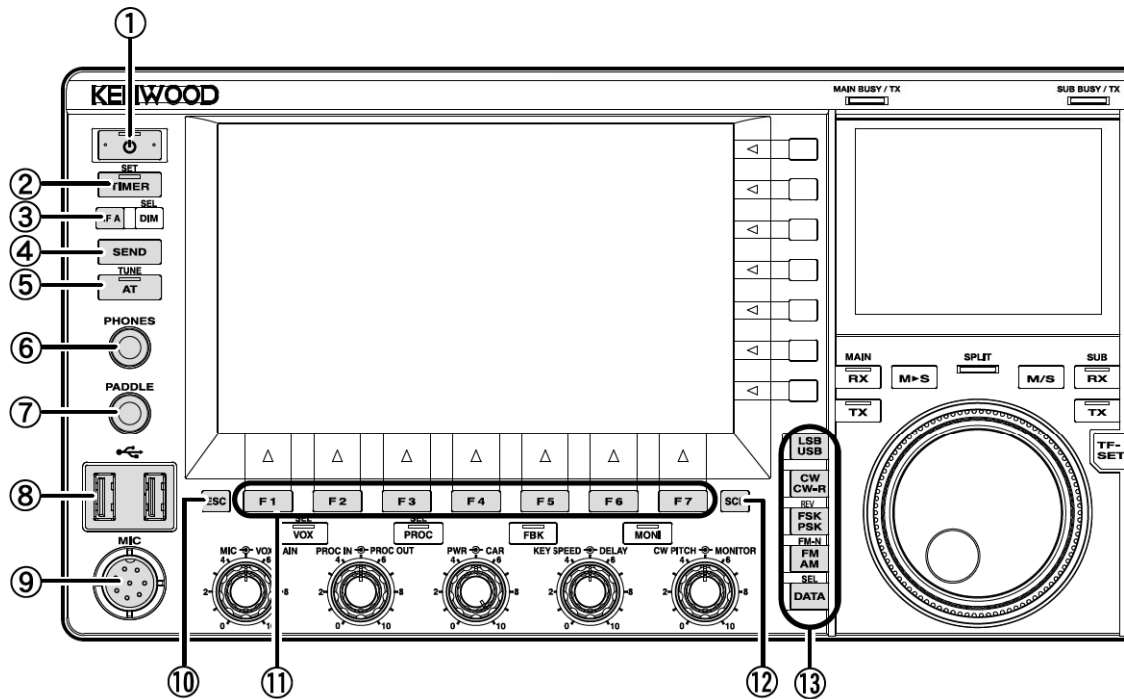
**DISPLAY**

## DISPLAY connector

Pin No.	Pin Name	Function	Input/Output
1	TMDS DATA 2-	Links to Transition Minimized Differential Signaling.	O
2	TMDS DATA 2+	Links to Transition Minimized Differential Signaling	O
3	2/4 SHILD	Links to the distributed TMDS.	-
4 to 7	NC	No connection	
8	A. VERTICAL SYNC	Sources the vertical synchronization signal to an analog interface.	O
9	TMDS DATA 1-	Links to Transition Minimized Differential Signaling	O
10	TMDS DATA 1+	Links to Transition Minimized Differential Signaling	O
11	1/3 SHILD	Links to the distributed TMDS.	-
12 or 13	NC	No connection	
14	5V	Supplies 5 V power source.	-
15	GND	Ground	-
16	NC	No connection	
17	TMDS DATA 0-	Links to Transition Minimized Differential Signaling	O
18	TMDS DATA 0+	Links to Transition Minimized Differential Signaling	O
19	0/5 SHILD	Links to the distributed TMDS.	-
20 or 21	NC	No connection	
22	CLOCK SHILD	Shields the Transition Minimized Differential Signaling.	-
23	TMDS CLOCK +	The Transition Minimized Differential Signaling clock.	O
24	TMDS CLOCK -	The Transition Minimized Differential Signaling clock.	O
C1	A. RED	Analog signal (red)	O
C2	A. GREEN	Analog signal (green)	O
C3	A. BLUE	Analog signal (blue)	O
C4	A. HORIZONTAL	Sources the horizontal synchronization signal to an analog interface.	O
C5	A. GND	Analog signal grounding	-

## 2 PANEL DESCRIPTION

### Front Panel



#### ① Power key: [POWER]

With each key press, starts up or shuts down the transceiver. {page 4-1}

"POWER" LED

Lights green while the transceiver is turned ON.

Lights orange while the transceiver is turned OFF.

#### Note:

- The main power switch (I/O) is available on the rear panel. While the main power switch is in the "O" position, the transceiver cannot start up even with a press of [apple]. {pages 2-8 and 4-1}

#### ② Timer key: [TIMER/SET]

With each key press, toggles a timer between On and Off. {page x-x}

With a long key press, opens the Timer screen. {page x-x}

"TIMER" LED

Lights green while the timer is active.

Blinks green upon occurrence of an error in the timer.

#### ③ PF A key: [PFA]

With a key press, activates the function assigned to [PF A]. The default is a voice guidance request with VOICE 2. {page x-x}

#### ④ Send key: [SEND]

With each key press, toggles the transceiver between TX and RX. A key press places the transceiver into the TX state, and the next key press places the transceiver into the RX state. {page 4-13}

#### ⑤ Antenna Tune key: [AT/TUNE]

With each key press, toggles the internal antenna tuner between active and inactive. {page 4-16}

With a long key press, starts tuning the internal antenna tuner. "AT" LED

Lights green while an external antenna tuner is connected to the transceiver. Blinks green during the tuning.

#### ⑥ Headphones jack: PHONES

Connects a set of headphones. {page 1-2}

#### ⑦ Paddle jack: PADDLE

Connects a paddle for CW operation. {page 1-2}

#### ⑧ USB connector: [USB-A]

Any USB flash drive or USB keyboard (with an A type connector) sold in the market place can be connected. {pages 1-2 and X-x}

#### ⑨ Microphone jack: [MIC]

Connects a microphone. {page 1-2}

#### ⑩ Escape key: [ESC]

With each key press, closes the screen for configurations.

#### ⑪ PF 1 to PF 7 keys: [PF 1] to [PF 7] guided with Key Names on the Bottom of Main Screen

With a key press, activates a task assigned to each key name that appears on the bottom of the main screen.

#### ⑫ Bandscope key: [SCP]

With a key press, opens the Bandscope screen. With each key press, cycles through the Bandscope screen, the Bandscope with a Waterfall screen and no scope screen in series. {page x-x}

#### ⑬ Mode Keys

LSB/USB key: [LSB/USB]

Toggles between LSB mode and USB mode. {page 4-7}

CW/REV key: [CW/REV]

Toggles the side band between CW and CW-R. {page 4-7}

FSK/PSK/REV key: [FSK/PSK/REV]

With each key press, toggles between FSK mode and PSK mode. {page 4-7}

With a long key press, toggles the side band between normal and reverse (between FSK and FSK-R, or between PSK and PSK-R). {page 4-7}

FM/AM/FM-N key: [FM/AM/FM-N]

With each key press, toggles between FM mode and AM mode.

With a long key press, toggles the FM mode between narrow and wide.

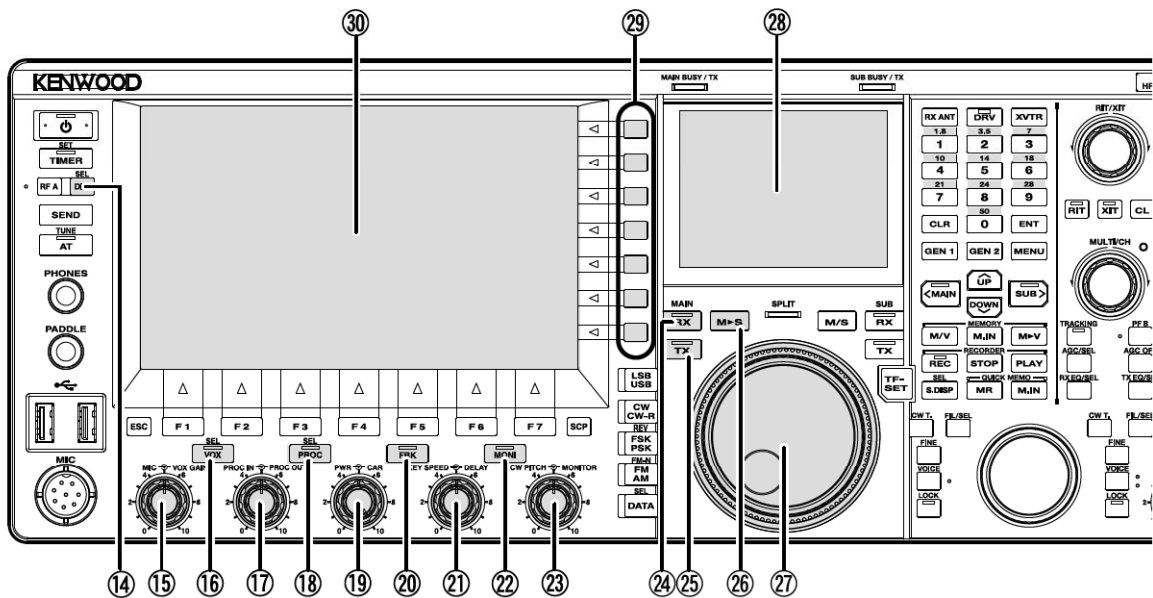
- Narrow: FM-N
- Wide: FM

Placing the transceiver into Narrow reduces the IF filter bandwidth during the RX allowing you more accurate selection. The amount of the shift frequency is narrowed during the TX and the occupied bandwidth decreases. {page 4-7}

Data key: [DATA/SEL]


With each key press, cycles the data mode through Off, 1, 2, 3, and then back to Off. {page 4-7}

With a long key press, opens the Modulation Line Select screen. {page x-xx}



**14** Dimmer key: [DIM/SEL]

With each key press, changes the display brightness, the preconfigured dimmer level. {page 4-x}  
 With a long key press, opens the Dimmer Setting screen. {page 4-x}

**15** Microphone and VOX Gain controls: MIC  VOX GAIN

MIC control: Adjusts the microphone gain level. {page x-xx}  
 VOX GAIN control: Adjusts the VOX gain level. {page x-xx}

**16** VOX key: [VOX/SEL]

With each key press, toggles the VOX between active and inactive. {page x-xx}  
 With a long key press, opens the VOX screen. {page x-xx}  
 "VOX" LED  
 Lights green while the VOX is active.

**17** Speech Processor Input/Output Level controls: PROC IN  PROC OUT

PROC IN: Adjusts the input level to a speech processor. {page x-xx}  
 PROC OUT: Adjusts the output level from a speech processor {page x-xx}

**18** Speech Processor key: [PROC/SEL]

With each key press, toggles the Speech Processor between active and inactive. {page x-xx}  
 With a long key press, opens the Speech Processor Effect screen. {page x-xx}  
 "Speech Processor" LED  
 Lights green while the Speech Processor is active.

**19** TX Power and Carrier controls: PWR  CAR

TX POWER control: Adjusts the transmit power. {page x-xx}  
 CARRIER control: Adjusts the carrier levels for CW, FSK, PSK and AM modes. {page x-xx}

**20** Full Break-in key: [FBK]


With each key press, toggles the Full Break-in between active and inactive. {page x-xx}  
 "FBK" LED  
 Lights green while Full Break-in is active.

**21** Key Speed and Delay Time controls: KEY SPEED  DELAY

KEY SPEED control: Adjusts the keying speed. {page x-xx}  
 DELAY control: Adjusts the break-in delay time. {page x-xx}

**22** Monitor key: [MONI]

With each key press, toggles the TX monitor between active and inactive. {page x-xx}  
 "MONI" LED  
 Lights green while the TX monitor is active. {page x-xx}

**23** CW Pitch and Monitor controls: CW PITCH  MONITOR

CW PITCH control: Adjusts the pitch frequency for CW. {page x-xx}  
 MONITOR control: Adjusts the TX monitor level. {page x-xx}

**24** RX (Main band) key: [RX] (M)

With a key press, places the transceiver into Simplex mode. {page 5-x}  
 "RX" (Main band) LED  
 Lights green while the reception capability in the main band is active. {page 5-x}

**23** TX (Main band) key: [TX] (M)

With a key press while the "RX" (Sub band) LED lights, assigns the main band frequency to be transmitted. {page x-x}  
 "TX" (Main band) LED  
 Lights green while the transmission capability in the main band is active. {page x-x}

**26** Main to Sub key: [M<math>\boxtimes</math>S]

With a key press, copies the main band frequency and the mode configuration data to the sub-band. {page 5-x}

**27** Tuning (Main) control: Tuning (M)

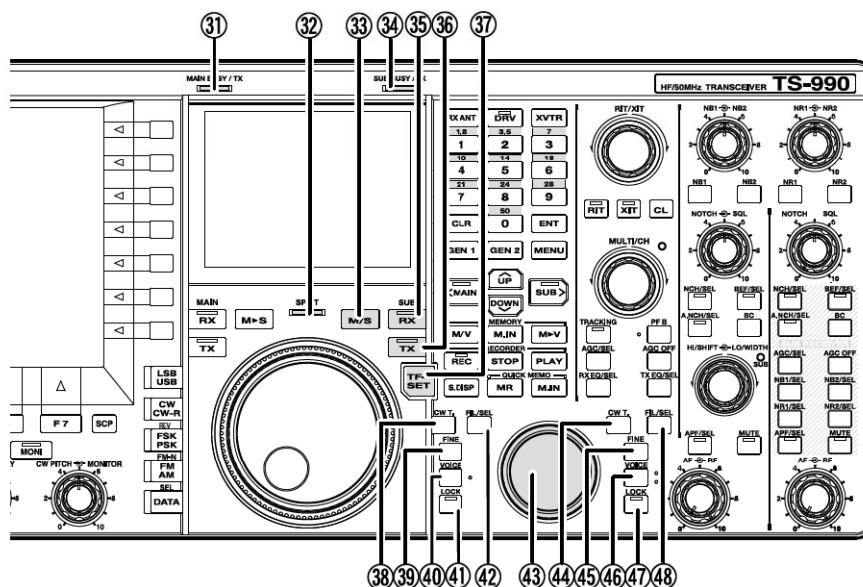
Tunes the transmit and receive frequencies for the selected band. Increases the frequency with a rotation clockwise, and decreases the frequency with a rotation counterclockwise. The rotation torque of the Tuning (main) control can be changed as desired. Securely pinch the ring, with linear chases on it, positioned on the back side of the dial, then rotating the dial, with the pyramid-projected surface, clockwise weights the rotation torque and counterclockwise reduces the rotation torque.

**28** Sub-screen

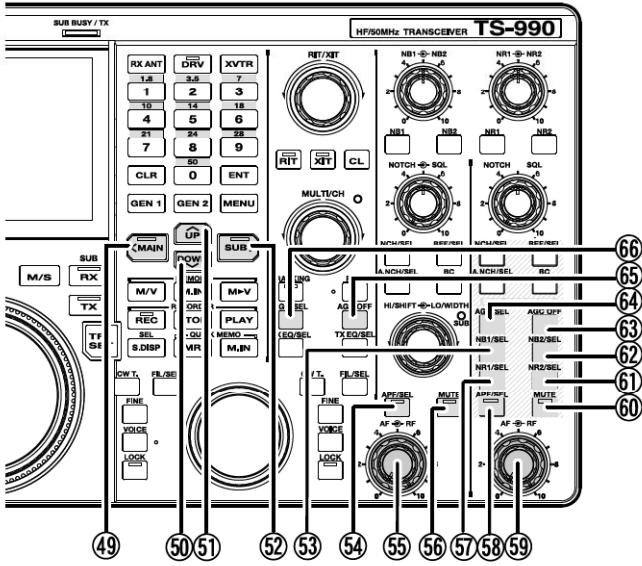
The 3.5" Color TFT LCD {page 2-10}

**29** Function Keys guided with Key Names on the Right Edges of Main Screen

With a key press, activates a task assigned to each key name that appears on the right edge of the main screen.

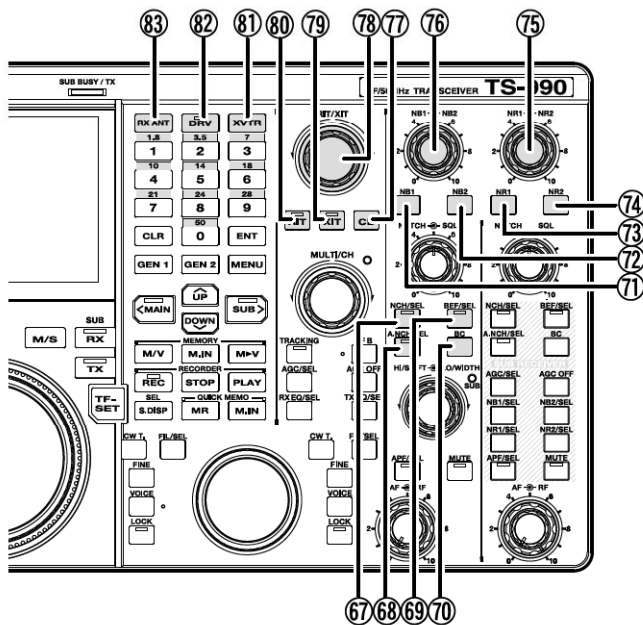


- 30 Main Screen**  
The 7" Color TFT LCD {page 2-13}
- 31 MAIN BUSY/ TX LED**  
Lights red during the transmit using the main band. Lights green while the squelch opens in the main band.
- 32 SPLIT LED**  
Lights green while the transceiver is placed in Split operation.
- 33 Main Band and Sub-band key: [M/S]**  
With each key press, toggles the frequency and mode information between main band and sub-band. {page x-xx}
- 34 SUB BUSY/ TX LED**  
Lights red during the transmit using the sub band. Lights green while the squelch opens in the main band.
- 35 RX (Sub-band) key: [RX] (S)**  
With each key press, toggles the reception capability for the sub-band between active and inactive. {page 5-x}  
"RX" (Sub-band) LED  
Lights green while the reception capability in the sub-band is active.
- 36 TX (Sub-band) key: [TX] (S)**  
With a key press while the "TX" (Main band) LED lights, assigns the sub-band frequency to be transmitted and places the transceiver in Split mode. {page xx}  
With a long key press, enables the configuration for Split frequency. {page x-x}  
"TX" (Sub-band) LED  
Lights green while the transmission capability in the sub-band is active.
- 37 TX Frequency Set key: [TF-SET]**  
While holding down a key, temporarily receives using the transmit frequency. {page x-x}
- 38 CW Auto Tune (Main Band) key: [CWT.] (M)**  
With a key press, activates the CW auto tuning for the main band. {page x-xx}
- 39 Fine Tuning (Main Band) key: [FINE] (M)**  
With each key press, toggles the fine tuning for the main band between active and inactive. {page x-xx}
- 40 Voice (Main Band) key: [VOICE] (M)**  
With a key press, activates the function assigned to [VOICE] (Main) The default is the request for voice guidance for the main band. {page x-x}
- 41 Lock (Main Band) key: [LOCK] (M)**  
With each key press, toggles the main band frequency lock between active and inactive {page x-xx}  
"Frequency Lock" (Main band) LED  
Lights while the frequency lock for the main band is active. {page x-xx}
- 42 Filter (Main Band) key: [FIL/SEL] (M)**  
With each key press, cycles the receive filter for main band through Filter A, Filter B, Filter C, and then back to Filter A. {page x-xx}  
With a long key press, opens the RX Filter Setting screen. {page x-xx}
- 43 Tuning (Sub-band) control: Tuning (S)**  
Tunes the transmit and receive frequencies for the sub-band. Increases the frequency with a rotation clockwise, and decreases the frequency with a rotation counterclockwise.
- 44 CW Auto Tune key for Sub-band: [CW T.] (S)**  
With a key press, activates the CW auto tuning for the sub-band. {page x-xx}
- 45 Fine Tuning (Sub-band) key: [FINE] (S)**  
With each key press, toggles the fine tuning for the sub-band between active and inactive. {page x-xx}
- 46 Voice (Sub-band) key: [VOICE] (S)**  
With a key press, activates the function assigned to [VOICE] (Sub-band) The default is the request for voice guidance for the sub-band. {page x-x}
- 47 Lock (Sub-band) key: [LOCK] (S)**  
With each key press, toggles the sub-band frequency lock between active and inactive {page x-xx}  
"Frequency Lock" (Sub-band) LED  
Lights while the frequency lock for the sub-band is active. {page x-xx}
- 48 Receive Filter (Sub-band) key: [FIL/SEL] (S)**  
With each key press, cycles the receive filter for the sub band through Filter A, Filter B, Filter C, and then back to Filter A.  
With a long key press, opens the RX Filter Setting screen. {page x-xx}



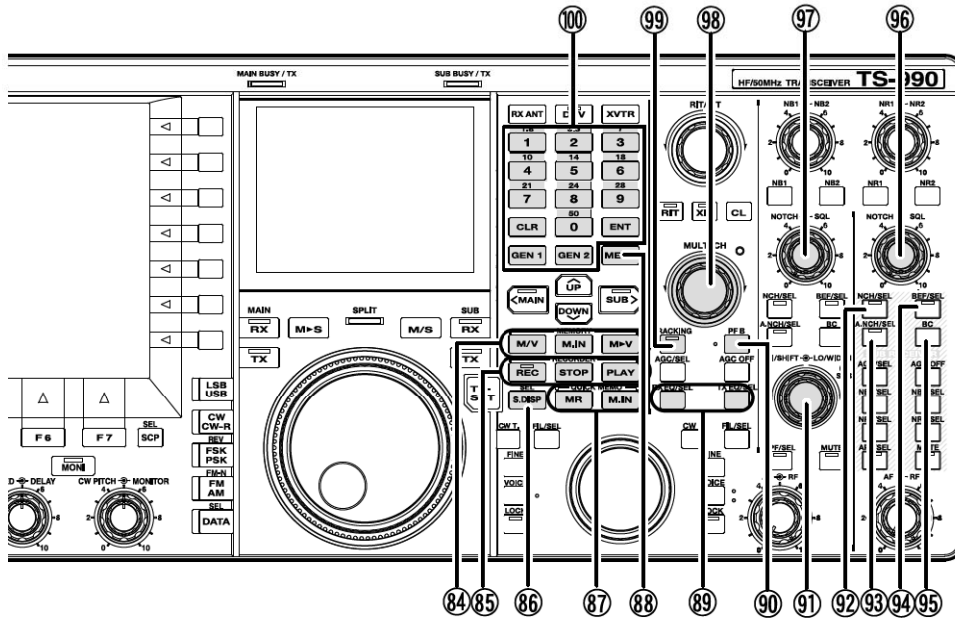
- 49) Main Band access key: [<MAIN]**  
 With a key press, switches the current operation band to the main band. While the configuration screen for any function is open, executes the key task, which varies depending on the configuration screen, for instance, moving the pointer to the left cell, etc. {page 4-x}  
 "Main band" LED  
 Lights green while the main band is selected as the current operation band.
- 50) Down key: [DOWN]**  
 With each key press, decreases the frequency in steps of 1 MHz. While a key is pressing down, the frequency continuously decreases. While the configuration screen for any function is open, executes the key task, which varies depending on the configuration screen, for instance, decreases or continuously decreases the parameter in proper step size. {page 4-x}
- 51) Up key: [UP]**  
 With each key press, increases the frequency in steps of 1 MHz. While a key is pressing down, the frequency continuously increases. While the configuration screen for any function is open, executes the key task, which varies depending on the configuration screen, for instance, increases or continuously increases the parameter in proper step size. {page 4-x}
- 52) Sub Band access key: [SUB>]**  
 With a key press, switches the current operation band to the sub-band. While the configuration screen for any function is open, executes the key task, which varies depending on the configuration screen, for instance, moving the pointer to the right cell, etc. {page 4-x}  
 "Sub-band" LED  
 Lights green while the sub-band is selected as the current operation band.

- 53) Noise Blanker 1 (Sub-band) key: [NB1/SEL] (S)**  
 With each key press, toggles the Noise Blanker 1 for the sub-band between active and inactive. {page x-xx}  
 With a long key press, opens the Noise Blanker 1 (Sub) screen. {page x-xx}
- 54) Audio Peak Filter (Main band) key: [APF/SEL] (M)**  
 With each key press, toggles the Audio Peak Filter for the main band between active and inactive. {page x-xx}  
 With a long key press, opens the Audio Peak Filter screen. {page x-xx}  
 "APF" (Main band) LED  
 Lights while Audio Peak Filter for the main band is active. {page x-xx}
- 55) AF/RF Gain (Main band) controls: AF RF (M)**  
 AF (M) control: Adjusts the AF level for the main band.  
 RF (M) control: Adjusts the RF level for the main band.
- 56) Mute (Main band) key: [MUTE] (M)**  
 With each key press, toggles the received audio for the main band between muted and unmuted. {page x-xx}  
 "Mute" (Main band) LED  
 Lights while the audio line for the main band is being muted.
- 57) Noise Blanker 1 (Sub-band) key: [NB1/SEL] (S)**  
 With each key press, toggles the Noise Reduction 1 for the sub-band between active and inactive. {page x-xx}  
 With a long press, opens the Noise Reduction 1 (Sub) screen. {page x-xx}
- 58) Audio Peak Filter (Sub-band) key: [APF/SEL] (S)**  
 With each key press, toggles the Audio Peak Filter for the sub band between active and inactive. {page x-xx}  
 With a long press, opens the Audio Peak Filter (Sub) screen.  
 "APF" (Sub-band) LED  
 Lights while Audio Peak Filter for the sub-band is active. {page x-xx}
- 59) AF/RF Gain Sub-band) controls: AF RF (S)**  
 AF (S) control: Adjusts the AF level for the sub-band.  
 RF (R) control: Adjusts the RF level for the sub-band.
- 60) Mute (Sub-band) key: [MUTE] (S)**  
 With each key press, toggles the received audio for the sub-band between muted and unmuted. {page x-xx}  
 "Mute" (Sub-band) LED  
 Lights while the audio line for the sub-band is being muted.
- 61) Noise Blanker 2 (Sub-band) key: [NB2/SEL] (S)**  
 With each key press, toggles the Noise Reduction 2 for the sub-band between active and inactive. {page x-xx}  
 With a long press, opens the Noise Reduction 2 (Sub) screen. {page x-xx}
- 62) Noise Blanker 2 (Sub-band) key: [NB2/SEL] (S)**  
 With each key press, toggles the Noise Blanker 2 for the sub-band between active and inactive. {page x-xx}  
 With a long key press, opens the Noise Blanker 2 (Sub) screen. {page x-xx}
- 63) AGC OFF (Sub-band) key: [AGC OFF] (S)**  
 With each key press, toggles the Automatic Gain Mode for the sub-band between active and inactive. {page x-xx}
- 64) AGC (Sub-band) key: [AGC/SEL] (S)**  
 With each key press, cycles the speed of Automatic Gain Control for the sub-band through Fast, Medium, Slow, and then back to Fast. {page x-xx}  
 With a long key press, opens the AGC screen for the sub-band. {page x-xx}
- 65) AGC (Main band) key: [AGC OFF] (M)**  
 With each key press, toggles the Automatic Gain Control for the main band between active and inactive. {page x-xx}



- 66** AGC (Main band) key: [AGC/SEL] (M)  
 With each press, cycles the speed of Automatic Gain Control for the main band through Fast, Medium, Slow, and then back to Fast. {page x-xx}  
 With a long key press, opens the AGC screen for the main-band. {page x-xx}
- 67** Notch Filter (Main band) key: [NCH/SEL] (M)  
 With each key press, toggles the Manual Notch Filter for the main band between active and inactive {page x-xx}  
 With a long key press, toggles the Manual Notch Filter bandwidth for the main band between normal and wide. {page x-xx}  
 "NCH" (Main band) LED  
 Lights green while the manual notch for the main band is active. {page x-xx}
- 68** Automatic Notch Filter (Main band) key: [A.NCH/SEL] (M)  
 With each key press, toggles the Automatic Notch Filter for the main band between active and inactive {page x-xx}  
 With a long key press, opens the Auto Notch Setting screen for the main-band. {page x-xx}  
 "A.NCH" (Main band) LED  
 Lights green while the Automatic Notch Filter for the main band is active. {page x-xx}
- 69** Band Elimination Filter (Main band) key: [BEF/SEL] (M)  
 With each key press, toggles the Band Elimination Filter for the main band between active and inactive. {page x-xx}  
 With a long key press, opens the Band Elimination Filter Setting screen for the main-band. {page x-xx}  
 "BEF" (Main band) LED  
 Lights green while Band Elimination Filter Filter for the main band is active.
- 70** Beat Cancel (Main band) key: [BC] (M)  
 With each press, cycles the Beat Cancel for the main band through Beat Cancel 1, Beat Cancel 2, off, and then back to Beat Cancel 1. {page x-xx}
- 71** Noise Blanker 1 (Main band) key: [NB1] (M)  
 With each key press, toggles the Noise Blanker 1 for the main band between active and inactive. {page x-xx}

- 72** Noise Blanker 2 (Main band) key: [NB2] (M)  
 With each key press, toggles the Noise Blanker 2 for the main band between active and inactive. {page x-xx}
- 73** Noise Reduction 1 (Sub-band) key: [NR1] (S)  
 With each key press, toggles the Noise Reduction 1 for the sub-band between active and inactive. {page x-xx}
- 74** Noise Blanker 2 (Sub-band) key: [NB2] (S)  
 With each key press, toggles the Noise Reduction 2 for the sub-band between active and inactive. {page x-xx}
- 75** Noise Reduction 1 and Noise Reduction 2 (Main band) controls: NR1 NR2 (M)  
 NR1 control: Adjusts the level of Noise Reduction 1 for the main band. {page x-xx}  
 NR2 control: Adjusts the level of Noise Reduction 2 for the main band. {page x-xx}
- 76** NB1 and NB2 (Sub-band) controls: NB1 NB2 (S)  
 NB1 control: Adjusts the level of Noise Blanker 1 for the sub-band. {page x-xx}  
 NB2 control: Adjusts the level of Noise Blanker 2 for the sub-band. {page x-xx}
- 77** Clear key: [CL]  
 With a key press, clears the value configured for RIT and XIT frequencies. {page x-xx}
- 78** RIT and XIT controls: RIT/XIT  
 Precisely tunes the receive and transmit frequencies. {page x-xx}  
 The RIT frequency can be adjusted while the "RIT" LED lights green, and the XIT frequency can be adjusted while the "XIT" LED lights green.
- 79** XIT key: [XIT]  
 With each key press, toggles the XIT between active and inactive. {page x-xx}  
 "XIT" LED  
 Lights green while the XIT is active. {page x-xx}
- 80** RIT key: [RIT]  
 With each key press, toggles the RIT between active and inactive. {page x-xx}  
 "RIT" LED  
 Lights green while the RIT is active. {page x-xx}
- 81** Transverter key: [XVTR]  
 With each key press, toggles the Transverter between active and inactive. {page x-xx}
- 82** TX Drive Output key: [DRV]  
 With each key press, toggles the TX Drive Output between active and inactive. {page x-xx}  
 "DRV" LED  
 Lights green while the TX Drive Output is active.
- 83** Receive Antenna key: [RX ANT]  
 With each key press, toggles the input to and output from the receive antenna between active and inactive. {page x-xx}
- 84** Memory keys  
 [M/V] key  
 With each key press, toggles the operation between Memory Channel Mode and VFO Mode. {page x-xx}  
 [M.IN] key  
 With each key press, toggles the memory scroll mode between active and inactive. {page x-xx}  
 [M∅V] key  
 With a key press, activates the memory shift. {page x-xx}



**85 Recorder keys**

[REC] key  
 With a key press, starts recording. {page x-xx}  
 With a long key press, starts the all time recording. Depending on the configurations, records the audio in the last 30 seconds. {page x-xx}  
 "REC" LED  
 Lights red during the recording.  
 [STOP] key  
 With a key press, stops recording or playing.  
 [PLAY] key  
 With a key press, plays the latest audio file recorded by the normal recording or the all time recording. Pressing the key while in playing the audio pauses the play. {page x-x}

**86 [S.DISP/SEL] key**

With a key press, changes the display contents for the sub-screen. {page 4-x}  
 With each key press, toggles the display between normal and enhanced. {page 4-x}

**87 Quick Memory keys**

[MR] key  
 With each key press, toggles the quick memory mode between active and inactive. {page x-xx}  
 [M.IN] key  
 With a key press, stores to a Memory Channel. {page x0-x}

**88 [MENU] key**

With a key press, places the transceiver in Menu Mode and opens the Menu screen. Pressing the key again ends Menu Mode. {page 3-1}

**89 DSP Equalizer keys**

[RXEQ/SEL] key  
 With each key press, toggles the RX DSP equalizer between active and inactive. {page x-xx}  
 With a long key press, opens the RX Equalizer screen. {page x-xx}  
 [TXEQ/SEL] key  
 With each key press, toggles the TX DSP equalizer between active and inactive. {page x-xx}  
 With a long key press, opens the TX Equalizer screen. {page x-xx}

**90 PF B key: [PF B]**

With a key press, activates the function assigned to [PF B]. The default is

a voice guidance request with VOICE 3. {page x-x}

**91 High/Shift and Low/Width controls: HI/SHIFT LO/WIDTH**

HI/SHIFT control  
 High Cut/Low Cut mode: Adjust the high cut frequency. {page x-xx}  
 Shift/Width Mode; Adjust the shift frequency. {page x-xx}  
 LO/WIDTH control  
 High Cut/Low Cut mode: Adjust the low cut frequency. {page x-xx}  
 Shift/Width Mode; Adjust the bandwidth. {page x-xx}  
 "SUB" LED (HI/SHIFT LO/WIDTH controls)  
 Lights while the frequency can be changed by the HI/SHIFT LO/WIDTH controls. {page x-xx}

**92 Notch Filter (Sub-band) key: [NCH/SEL] (S)**

With each key press, toggles the Manual Notch Filter for the sub-band between active and inactive {page x-xx}  
 With a long key press, toggles the Manual Notch Filter bandwidth for the sub-band between normal and wide. {page x-xx}  
 "NCH" (Sub-band) LED  
 Lights green while the manual notch for the sub-band is active. {page x-xx}

**93 Automatic Notch Filter (Sub-band) key: [A.NCH/SEL] (S)**

With each key press, toggles the Automatic Notch Filter for the sub-band between active and inactive  
 With a long key press, opens the Auto Notch Setting screen for the sub-band. {page x-xx}  
 "A.NCH" (Sub-band) LED  
 Lights green while the Automatic Notch Filter for the sub-band is active.

**94 Band Elimination Filter key: [BEF/SEL] (S)**

With each key press, toggles the Band Elimination Filter for the sub-band between active and inactive. {page x-xx}  
 With a long key press, opens the Band Elimination Filter Setting screen for the sub-band. {page x-xx}  
 "BEF" (Sub-band) LED  
 Lights green while Band Elimination Filter Filter for sub-band is active.

**95 [BC] (S)**

With each press, cycles the Beat Cancel for the sub-band through Beat Cancel 1, Beat Cancel 2, off, and then back to Beat Cancel 1. {page x-xx}

**96 Notch and SQL (Sub-band) controls: [NOTCH**** SQL] (S)**

NOTCH (S) control: Adjust the notch filter while the manual notch filter is active. [Adjusts the center frequency while the band elimination filter is active. {page x-xx}

SQL (S) control: Adjusts the squelch level for the sub-band. {page x-xx}

**97 Notch and SQL (Main band) controls: [NOTCH**** SQL] (M)**

NOTCH (M) control: Adjust the notch filter while the manual notch filter is active. [Adjusts the center frequency while the band elimination filter is active. {page x-xx}

SQL (M) control: Adjusts the squelch level for the main band. {page x-xx}

**98 Multi/Channel control: [MULTI/CH]**

Increments or decrements the frequency steps while in VFO mode. {page 4-x}

Increments or decrements the channel number while in Memory Channel Mode or Quick Memory Channel Mode. {page x-xx}

Shows the next or previous parameter while the menu or various configuration screen appears.

"Multi/Channel" LED

Lights orange if the channel number, a configuration item or a parameter (except the frequency change) can be changed or while the frequency change logs appear.

**99 Tracking key: [TRACKING]**

With each key press, toggles the frequency tracking between active and inactive. {page x-xx}

"TRACKING" LED

Lights green green while the tracking is active. {page x-xx}

**100 Numeric and Band-select Keypad**

[ENT]

With the desired numeric key pressed, enters a number.

[0 (50)] to [9 (28)]

With a key press, selects the bandwidth. Enters a number while in the numeric key entry mode. Enters the value for the shift frequency while in the split mode.

[GEN1]

With a key press, selects the General Coverage Band 1.

[GEN2]

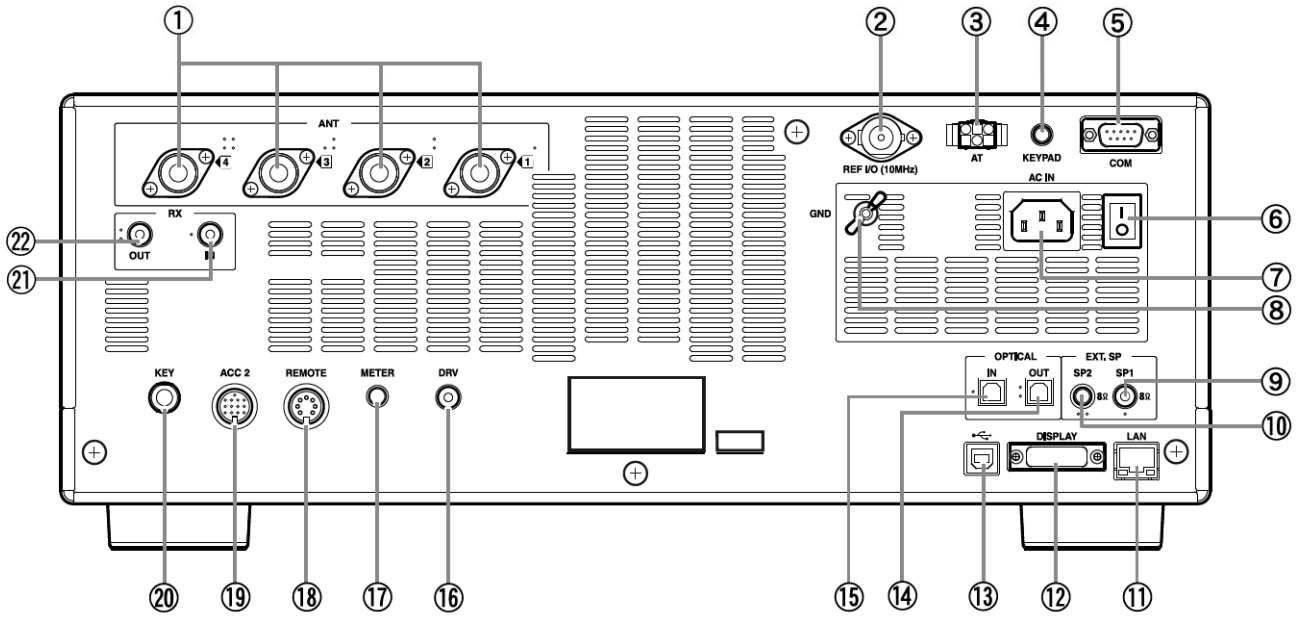
With a key press, selects the General Coverage Band 2.

[CLR]

With a key press, cleared the bandwidth entered while the transceiver is placed in the numeric key entry mode.

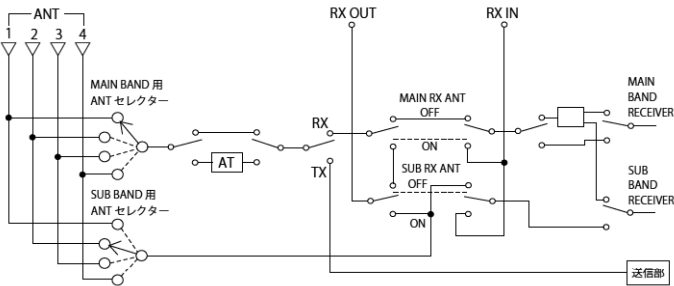


Rear Panel



① ANT 1 to ANT 4 (Antenna 1 to Antenna 4) connectors

Mates with the 50Ω antenna. The M-type coaxial connectors that can connect a maximum of 4 antennas. {page 1-1}  
 Note: Refer to the antenna systems conceptual drawing shown below:



② REF I/O (10 MHz) connector

Sends and receives the 10 MHz reference signal. {page x-x}

③ AT Connector

Mates with a control cable for an external antenna and the linear amplifier  
 Refer to the instruction manuals supplied with the antenna tuner and the linear amplifier for further details.

④ KEYPAD jack

You can connect the PF keypad you have made. The desired function can be assigned to the keypad from the specified functions. {page x-x}

⑤ COM connector

Is the RS232C connector for connection to a PC. Enables the control by means of a PC and the memory management. Connects to the PC using the RS232C straight cable commonly sold in a market place. {page 1-x}

⑥ Main Power switch

Shuts down (O) or applies (I) the main power source to the transceiver. While the main power switch is pressed down to the "O" position, the transceiver cannot start up even with a press of [ ]. {page 4-1}

⑦ AC IN connector

Is the connector for the AC main power source input. You must use the AC power cable supplied with the transceiver to connect to the household AC inlet rating in the range from AC 100 V to AC 240 V. {page 1-1}

⑧ GND terminal

You must use the ground wire to ground. To prevent you from being electrified or equipment from being interfered, ensure that this terminal has been grounded. {page 1-1}

⑨ EXT SP1 (External Speaker 1) jack

⑩ EXT SP2 (External Speaker 2) jack

Connects to an external speaker. You must use the external speaker with the 4 to 8Ω impedance. The audio signal to be sourced to the external speaker can be configured using the menu. {page 16-1}

⑪ LAN connector

Connects to a PC or a LAN so as to update the firmware, for instance. {pages 15-x and 17-x}

⑫ DISPLAY connector

Connects to an external display unit. What appears on the main screen can also be displayed on the external display unit. The contents displayed on the main screen can be transferred. Both analog and digital can be transferred. {page 16-x}

The DVI-I connector is employed to the DISPLAY connector that can transfer both digital and analog RGB signals.

To connect to the analog RGB display that has the D-sub 15-pin connector, use the conversion connector commonly sold in the market place.

Note:

- To connect to an external display unit, you must use the DVI cable commonly sold in the market place.
- The external display unit should have the resolution of 800 x 600 or 848 x 480.

⑬  (USB-B) connector

Connects to a PC. Enables the controls of the PC and the memory. Use the USB connector with the USB-B type connector, commonly sold in the market place, to mate with. {page x-x}

⑭ OPTICAL OUT (Optical Digital Audio Output) connector

Connects to an external equipment such as the sound board on a PC. Sampling Rate: 48 kHz/ 16 bit

⑮ OPTICAL IN (Optical Digital Audio Input) connector

Connects to an external equipment such as the sound board on a PC. Sampling Frequency: 44.1kHz/48 kHz

**Note:** To connect to an external equipment via the OPTICAL IN or OPTIOCAL OUT connector, use the optical cable commonly sold in the market place.

⑯ DRV (Drive Output) terminal

Connects to a transverter or a linear amplifier (1 mW typical input level). {page 16-x}

⑰ METER connector

Connects to an external meter. Following are the specifications of the meter that can be connected.

- Input Impedance: 4.7kΩ
- Open End Voltage: 0 to 5 V

**Note:** The default is 50% of the open end voltage (2.5 V). Output level can be changed in the Advanced Menu. {page x-x}

⑱ REMOTE connector

Mates with a linear amplifier. Use the supplied 7-pin DIN plug to mate with. {page 1-x}

⑲ ACC 2 connector

Connects to an external equipment such as an external terminal. Use the supplied 13-pin DIN plug to mate with. {page 1-x}

⑳ KEY jack

Connects to an electronic keyer such as a bag key, electronic keyer, etc. and a PC keyer. Depending on the menu configuration, an internal electronic keyer can be used with a paddle connection. {page 1-x}

㉑ RX IN connector

Connects to the antenna dedicated for reception, external BPF, transverter, etc. Transfers the received signal directly to a receiver without receiving a signal from an antenna connector. {page 4-x}

㉒ RX OUT connector

Connects to an external BPF, other receiver, transverter, etc. Entering the signal from this RX OUT connector to the RX IN connector enables the reception by an internal receiver.

Microphone (Option)

① PTT (Push-to-talk) switch

While a switch is pressed down, places the transceiver in the transmit mode. Releasing the switch reverts to the receive mode.

② Up and Down keys

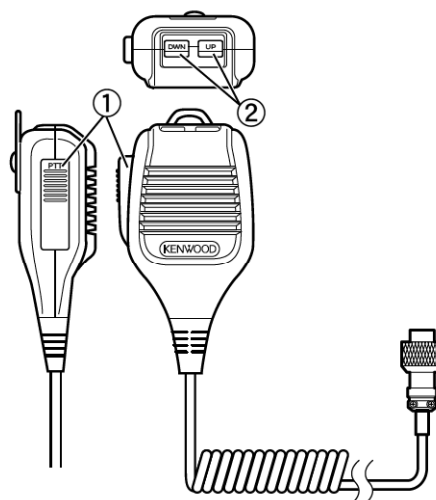
Parameters can be incremented or decremented in various mode below, for instance, increase and decrease of the VFO frequency.

The value can continuously be incremented or decremented while the key is being pressed down. Functions can be assigned to the keys as function keys. {page 16-x}

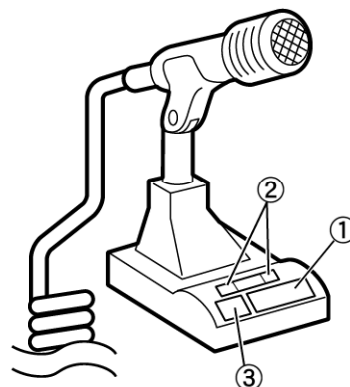
- VFO: Increases and decreases the VFO frequency.
- Memory Channel: Increments and decrements the memory channel number.
- Memory Scroll: Increments and decrements the memory scroll number.
- Paddling: Enters the padded code (dash and dot).
- Menu: Shows the next or previous parameter.

③ Lock button (MC-60A and MC-90 only)

With a button pressed, places the button in the locked state, and the transceiver is placed into the transmit mode. Pressing the button again reverts to the original state, and the transceiver resumes reception.

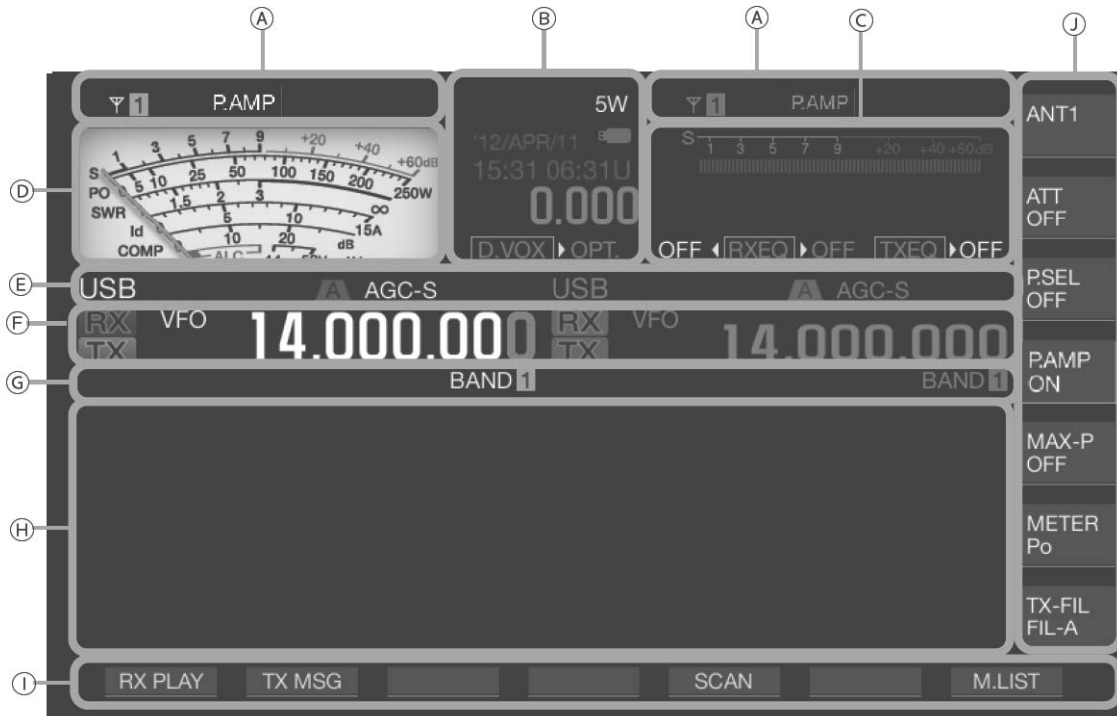


MC-43S










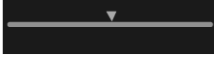












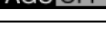








MC-60A/MC-90
















Displays (Main Screen)



Area	Display	Description	Ref. Page
A		Shows the antenna number. The antenna number changes followed by a change of the antenna. Disappears while the transmit signal is sent via the DRV connector to a transverter.	X-XX
		Appears while the antenna dedicated for reception is active.	X-XX
		Appears if "-6 dB", "-12 dB" or "-18 dB" has been configured for the reception attenuator.	X-XX
		Appears while the Reception Preamp is active.	X-XX
	 	Appears while the Noise Reduction 1 (NR1) is active. Appears while the Noise Reduction 2 (NR2) is active.	X-XX
	  	Appears while the Noise Blanker 1 (NB1) is active. Appears while the Noise Blanker 2 (NB2) is active. Appears while the Noise Blanker 1 (NB1) and Noise Blanker 2 (NB2) are active.	X-XX
B	 	Appears while an internal antenna tuner is active. "ILG" appears and disappears alternately while in tuning. Appears while an external antenna tuner is active. "T" or "T" alternately appears while in tuning.	X-XX
		Appears while a transverter is active.	X-XX
	TXTUNE	Appears and disappears alternately while TX Tuning is active.	X-XX
		Shows the transmit power level. Disappears while the transmit signal is sent via the DRV connector.	X-XX
	30WPM	Represents the keying speed (words per minute). Upon a rotation of the KEY SPEED control, displays in the TX display the keying speed value (4 to 60 words per minute) for two seconds.	X-XX
		Shows the date allocated for the 1st clock. The display format can be selected from the English, US and Japanese formats.	X-XX
		Shows the clock in the 24-hour format. Left: Shows the clock of the 1st Clock. Right: Shows the clock of the 2nd Clock ("U" is suffixed).	X-XX
	Appears while the USB flash drive is connected and if the transceiver has recognized the USB flash drive.	X-XX	

Area	Display	Description	Ref. Page
B		Appears while the RIT is active.	X-XX
		Appears while the XIT is active.	X-XX
		Shows the RIT or XIT frequency in the range from -9.999 to +9.999 kHz.	X-XX
		Appears while Data VOX is active and while IF Output is inactive. Varies followed by the selected input audio sources for the transmit audio. "NONE" appears if no audio signal is entered from any audio sources. "ACC 2" appears while an audio signal is entered from the ACC 2 connector. "USB" appears while an audio signal is entered from the USB audio line. "OPT." appears if SPD I/F has been selected.	X-XX
		Appears while Data VOX is inactive and while IF Output is active.	X-XX
C		Represents the status of recording.	X-XX
		Appears during the quick play of the audio that was recorded using the normal recording or the all-time recording.	
		Appears while the quick play of the audio that was recorded using the normal recording or the all-time recording is being paused.	
		Appears during the normal recording.	X-XX
		Appears during the quick play of the audio after recording and while play of the audio is being paused.	
		Appears followed by the configuration for TX DSP equalizer. OFF, HB1, HB2, FP, BB1, BB2, C, U1, U2, or U3	X-XX
		Left: Appears according to the configuration for RX DSP Equalizer for the main band. OFF, HB1, HB2, FP, BB1, BB2, FLAT, U1, U2, or U3 Right: Appears according to the configuration for RX DSP Equalizer for the sub-band. OFF, HB1, HB2, FP, BB1, BB2, FLAT, U1, U2, or U3	X-XX
	Appears as the S-meter dedicated for the sub-band.	X-XX	
D		Appears as the meter dedicated for the main band. <ul style="list-style-type: none"> <li>Either analog or digital meter can be selected.</li> <li>Displays in the transmit meter can be changed while the analog meter appears.</li> </ul>	4-XX
E		Shows which operating mode has been in use. Appears in yellow while Auto Mode is active. Shows the mode name and the sub-number (D1, D2 and D3) while in the data mode.	X-XX
		Appears while Manual Notch, for which Normal has been configured for the notch bandwidth, is active.	
		Appears while Manual Notch, for which Wide has been configured for the notch bandwidth, is active.	
		Appears while Band Elimination Filter is active.	
		Appears while Auto Notch Filter is active.	
		Shows the selected IF filter.	X-XX
		Appears while Beat Canceled 1 (BC1) is active.	X-XX
		Appears while Beat Canceled 2 (BC2) is active.	
		Appears while the AGC is inactive.	X-XX
		Appears while the AGC is in the slow state.	
		Appears while the AGC is in the fast state.	
		Appears while the AGC is in the medium speed.	
		Appears while an tone function is inactive.	
		Appears while the CTCSS is inactive.	
	Appears while Cross Tone is active.		

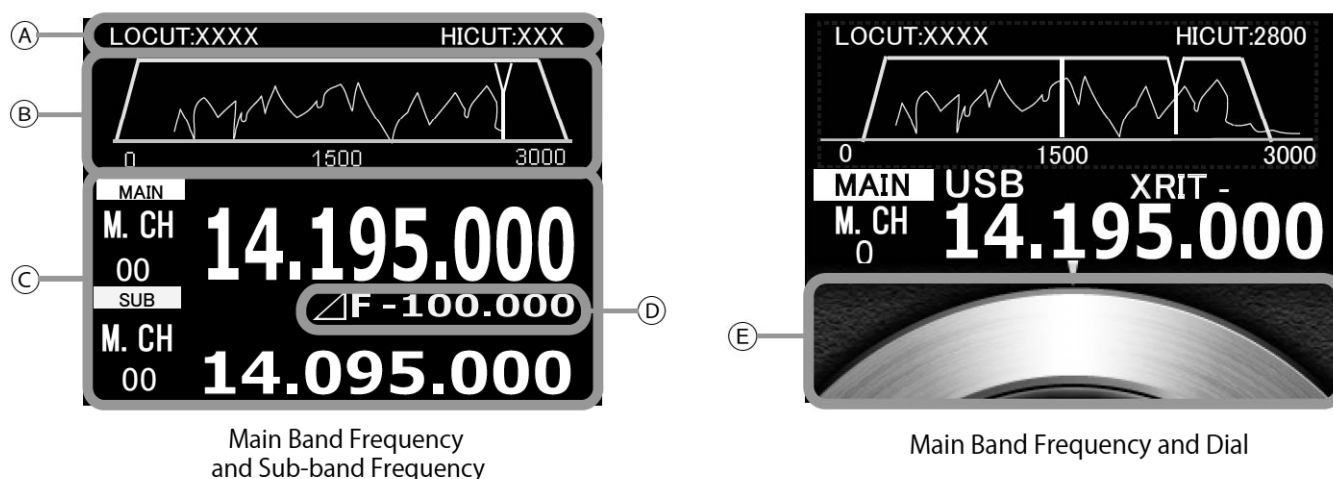
## 2 PANEL DESCRIPTION

Area	Display	Description	Ref. Page
F		Appears during the reception using the transmit band.	X-XX
		Shows the transmit band. (Only one transmit band is displayed for the main band and the sub-band.) Appears during the transmission using the transmit band.	
		Shows the receive band.	
		Appears while in VFO Mode or while Auto Mode frequency is being configured.	
		Shows while the transceiver is placed in the frequency entry mode in VFO mode and shows the entry history. Shows one of 10 entries, Entry No. 0 to 9.	
		Appears during the transmission or reception using the operating information diverted from memory channels. Shows the memory channel in the range from P0 to P9 and from E0 to E9.	
		Appears while in Quick Memory Channel mode. Shows one of the quick memory channel in the range from Q0 to Q9.	
		Shows the current frequency.	X-XX
G		Shows the memory channel name. Appears, if a memory channel has been configured, during the transmission and reception using the operating information diverted from memory channels, or while the operating information for a memory channel is being inquired.	X-XX
		Shows the scan speed of Program Scan (in other mode than FM mode).	X-XX
		Appears during the Program Scan.	
		Appears during the Program Slow Scan.	
		Appears during the CW Auto Tune.	X-XX
		Shows the memory band name of the inquired memory number.	
		Appears if the locked-out channel was selected. Appears during the transmission and reception using the operating information diverted from memory channels, or while the operating information for a memory channel is being inquired.	X-XX
H		Displays the configuration screen and the bandsopes. Appears on demand.	X-XX
I		Shows the function key names positioned on the bottom of the main screen.	X-XX
J	Sub-menu and function names.	Shows the function key names positioned on the right end of the main screen.	X-XX

## Note:

- If displays for the main band are identical to those for the sub-band, selecting the main band for operation deactivates the sub-band and displays for the sub-band gray out.

Displays (Sub-screen)



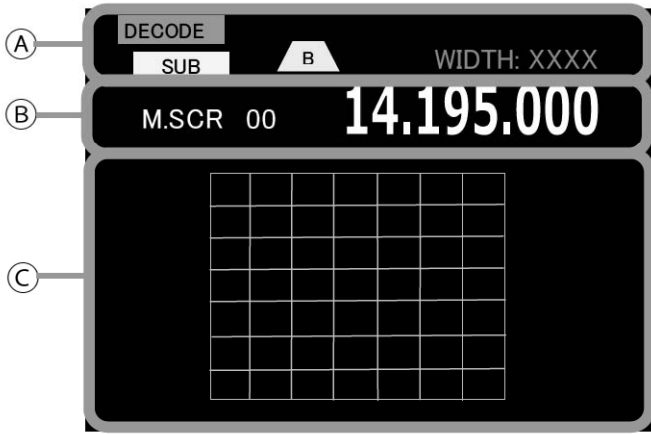
Main Band Frequency and Sub-band Frequency

Main Band Frequency and Dial

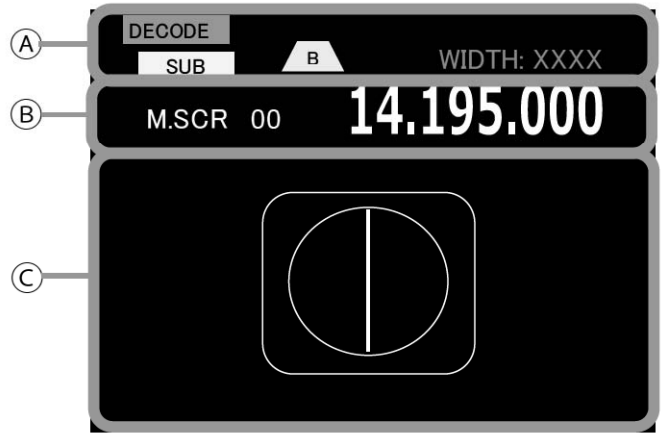
Note:

- Pressing [S.DISP/SEL] changes the sub-screen displays. Refer to 4 Basic Operations {page 4-3} for further details.

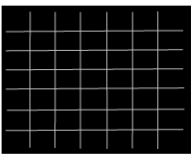
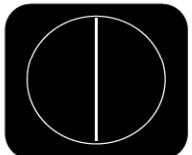
Area	Display	Description	Ref. Page
A		Shows the passband characteristics and the audio FFT. Rotating the HI/SHIFT or LO/WIDTH control reverses the display for 2 seconds. "WIDTH" appears if a filter for CW, FSK, PSK, or DATA mode has been selected. "SHIFT" appears if a filter for CW, or DATA mode has been selected. "LOCUT" appears if a filter for SSB, or AM mode has been selected. "HICUT" appears if a filter for SSB, AM, or FM mode has been selected.	4-XX
B		Shows the filter width, followed by the low cut or high cut frequency and the shift frequency, and the filter type.	4-XX
		Shows, if the transceiver is in receive mode, the waveform of the selected band by means of the Fourier transformation in audio frequency range.	
		Shows the center pointer of the notch frequency. Appears while either Manual Notch Filter or Band Elimination Filter is active. Rotation of the NOTCH control shifts left and right the center pointer of the notch frequency.	
C		Shows the selected band, either main band or sub-band.	
		Shows which operating mode has been in use.	
		Appears coupled with the frequency while either RIT or XIT is active.	
		Appears while the operating information diverted from memory channels is inquired.	
		Appears during the transmission or reception using the operating information diverted from memory channels.	
		Appears while in Quick Memory Channel mode.	
		Appears while in VFO mode.	
D		Shows the difference frequency from the main band frequency to the sub-band frequency in the range from 000.000 to 999.999 Hz. Shows the split frequency while in Split mode.	4-XX
		Displays a dial. (Displays while only main band frequency in the standard mode is selected.) Displays the sub-band frequency while both main band frequency and sub-band frequency are displayed.)	4-XX



X-Y Scope



Vector Scope

Area	Display	Description	Ref. Page
A	<b>DECODE</b> <b>ENCODE</b>	Shows the status of transmission and reception in RTTY mode.	X-XX
	<b>MAIN</b> <b>SUB</b>	Shows the band (either main band or sub-band) that has been decoded.	X-XX
	<b>A</b> <b>B</b> <b>C</b>	Shows the selected IF filter.	X-XX
	WIDTH: XXXX	Shows the passband width of intermediate frequency. Rotating the LO/WIDTH control reverses the display for 2 seconds.	
B	<b>14.195.000</b>	Shows the current operating frequency.	X-XX
	<b>M.SCR</b>	Appears while Memory Scroll is active.	X-XX
	<b>M.CH</b>	Appears while in Memory Channel mode.	
	<b>Q.MR</b>	Appears while in Quick Memory Channel mode.	
	<b>VFO</b>	Appears while in VFO mode.	
<b>00</b>	Shows one of the channel name in the range from 00 to E9 while in Memory Channel or Memory Scroll mode, or one of the channel name in the range from Q0 to Q9 while in Quick Memory Channel mode.		
C		Displays the X-Y scope.	X-XX
		Displays the vector scope.	X-XX