

YAESU
The radio

HF/50MHz TRANSCEIVER

FTDx10

Operation Manual

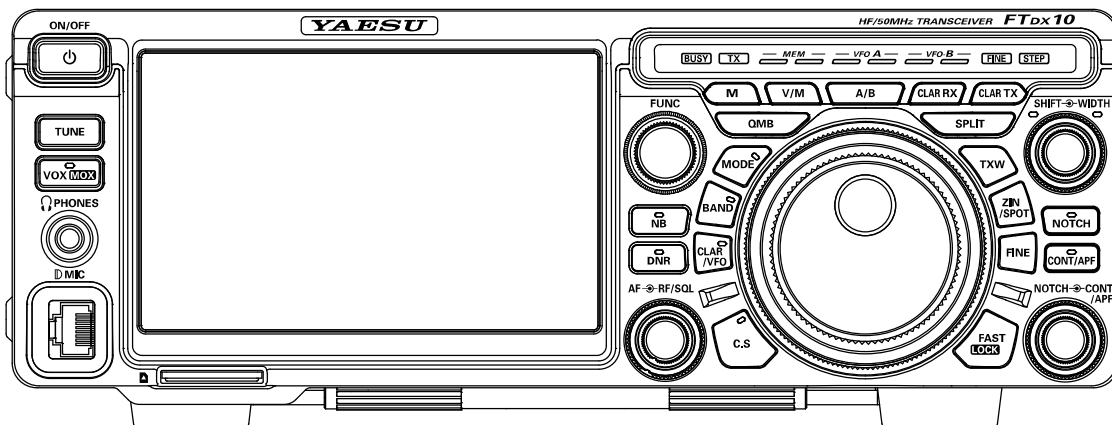


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Accessories & options

Supplied Accessories

- SSM-75E
- DC Power Cord
- Spare Fuse (25A)
- 1/4-inch 3-contact Plug
- Operation Manual

Available options

- | | |
|---|---|
| • Hand Microphone | SSM-75E (equivalent to the supplied microphone) |
| • Reference Microphone | M-1 |
| • Dual Element Microphone | M-100 |
| • Ultra-High-Fidelity Desktop Microphone | MD-200A8X |
| • Desktop Microphone | MD-100A8X |
| • Lightweight Stereo Headphone | YH-77STA |
| • External Automatic Antenna Tuner | FC-40 |
| • Remote Control Keypad | FH-2 |
| • Linear Amplifier/AC Power Supply | VL-1000/VP-1000 |
| • VL-1000 Linear Amplifier Connection Cable | CT-178 |

Installation and interconnections

Antenna Considerations

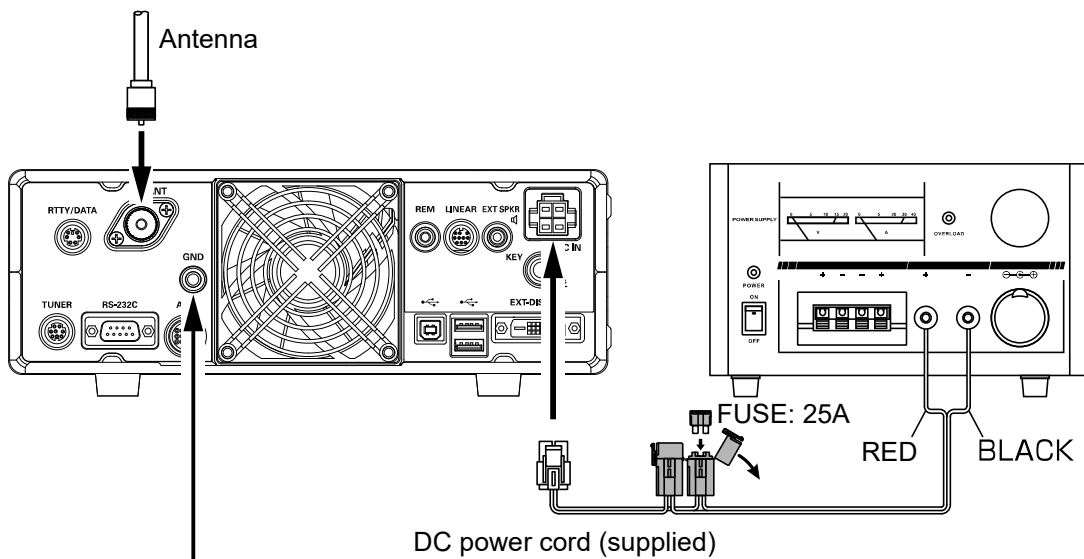
The FTDX10 is designed for 50 Ohm resistive impedance at the amateur operating frequencies. Select the proper antenna (dipole antenna, YAGI antenna, cubical quad antenna, etc.) suitable for the chosen operation and bands.

Construct the antenna and coaxial cable, or use a suitable antenna tuner, to maintain the impedance presented to the FTDX10 antenna connector for an SWR of 1.5 or less. Careful preparation of the antenna and/or tuner will permit maximum performance and protect the transceiver from damage.

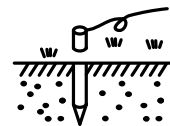
High voltages may be present on the antenna; install it so it will not be easily touched when in operation.

Connection of Antenna and Power Cables

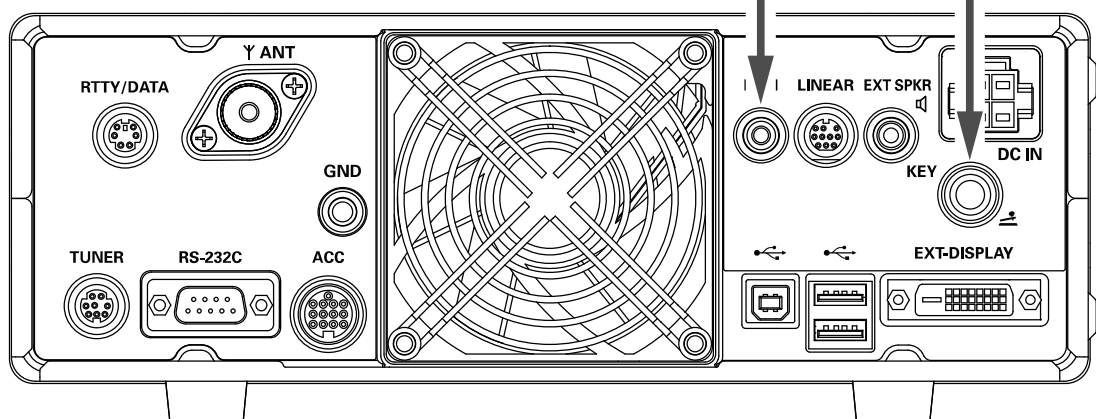
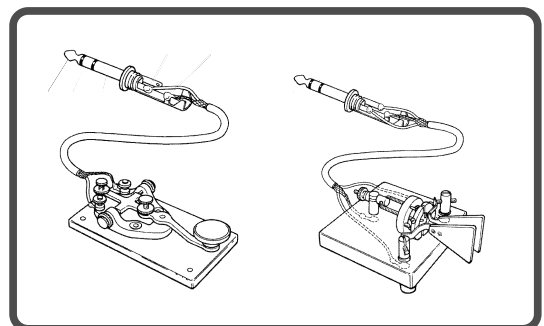
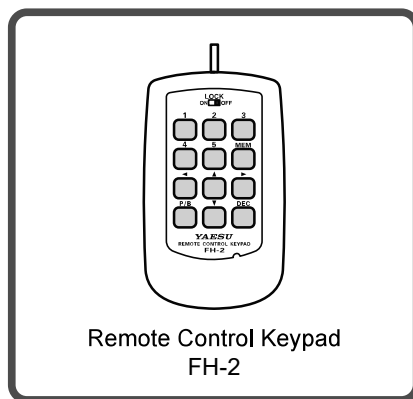
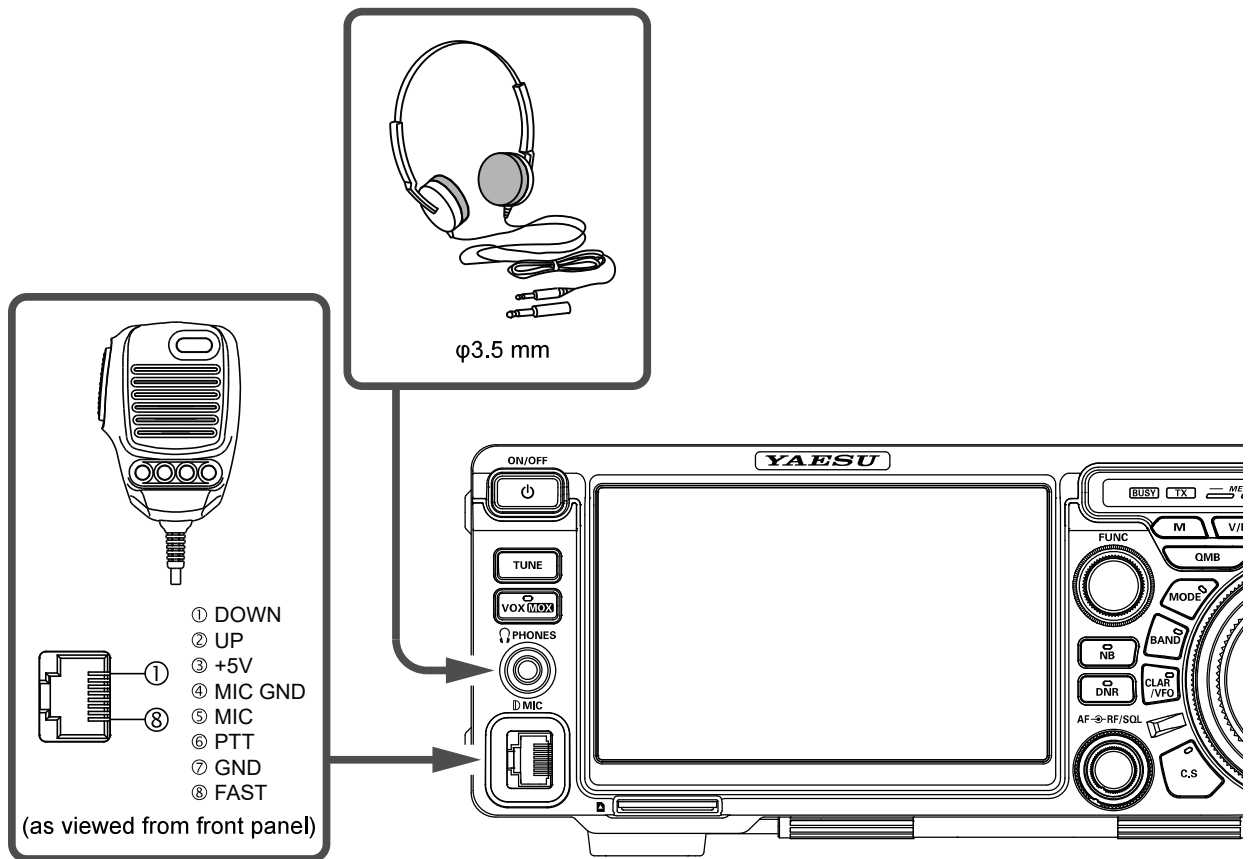
Please follow the outline in the illustration regarding the proper connection of antenna coaxial cables, as well as the DC power cable.



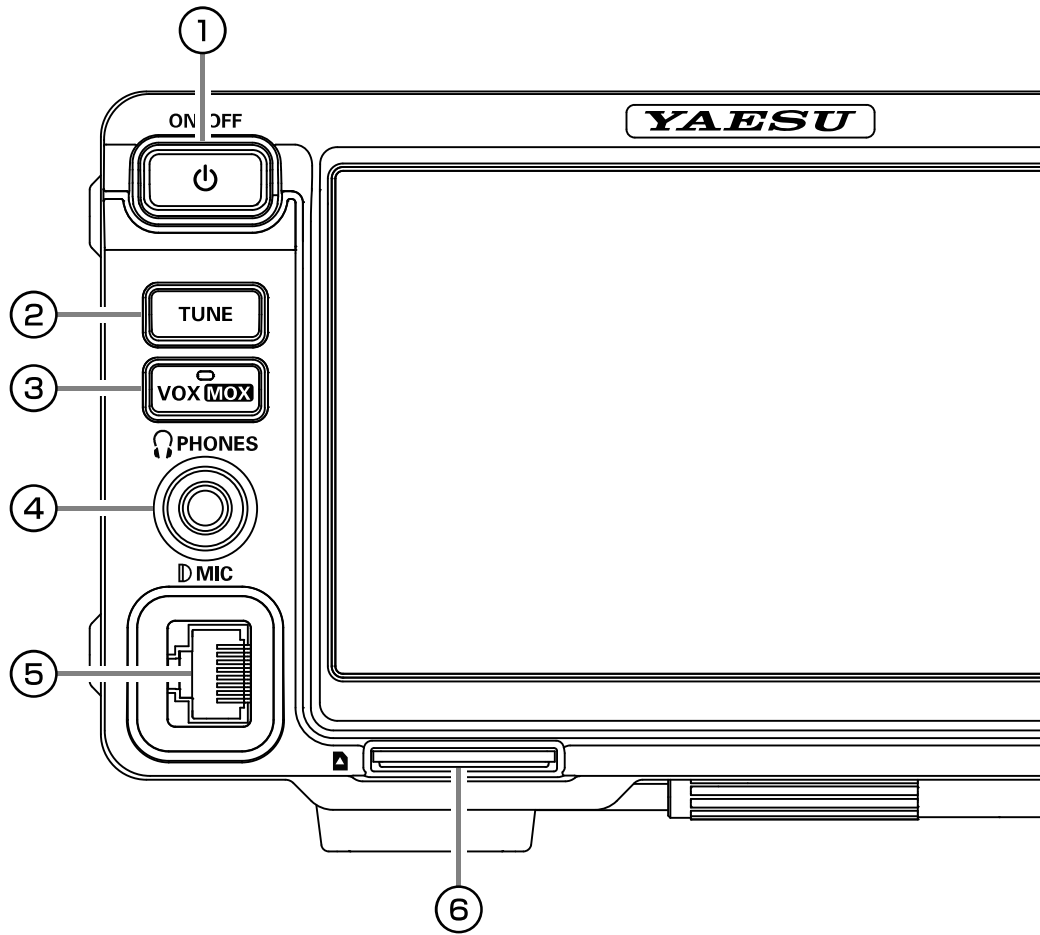
To prevent damage from lightning, atmospheric electricity, electrical shock etc., please provide a good earth ground.
Use a short, thick, braided cable to connect your station equipment to the buried ground rod (or alternative earth ground system).



Connection of Microphone, Headphone, Key, Keyer and FH-2



Front panel controls & Switches



① ON/OFF Switch

Press and hold in this switch for one second to turn the transceiver on. Similarly, press and hold in this switch for one second to turn the transceiver off.

② TUNE

This is the on/off switch for the FTDX10 Automatic Antenna Tuner.

Press the [TUNE] key briefly to activate the antenna tuner. Press the [TUNE] key briefly again to disable the antenna tuner.

Press the [TUNE] key for about 1 second to start "automatic tuning".



Since the transceiver transmits automatically during automatic tuning, make sure to connect an antenna or dummy load before tuning up.



When the antenna or dummy load does not match the impedance, "HI-SWR" will appear on the touch panel.

③ VOX/MOX

VOX
This key enables automatic voice-actuated transmitter switching. While VOX is activated, the LED inside this key glows orange.

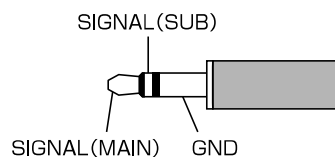
MOX
Press this key for about 1 second to engages the PTT (Push to Talk) circuit to activate the transmitter.

④ PHONES Jack

Connect headphones to this $\phi 3.5$ standard stereo jack.

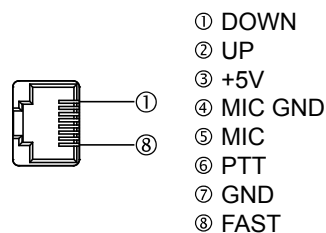


When wearing headphones, we recommend that you turn the AF Gain levels down to their lowest settings before turning power on, to minimize the impact on your hearing caused by audio "pops" during switch-on.



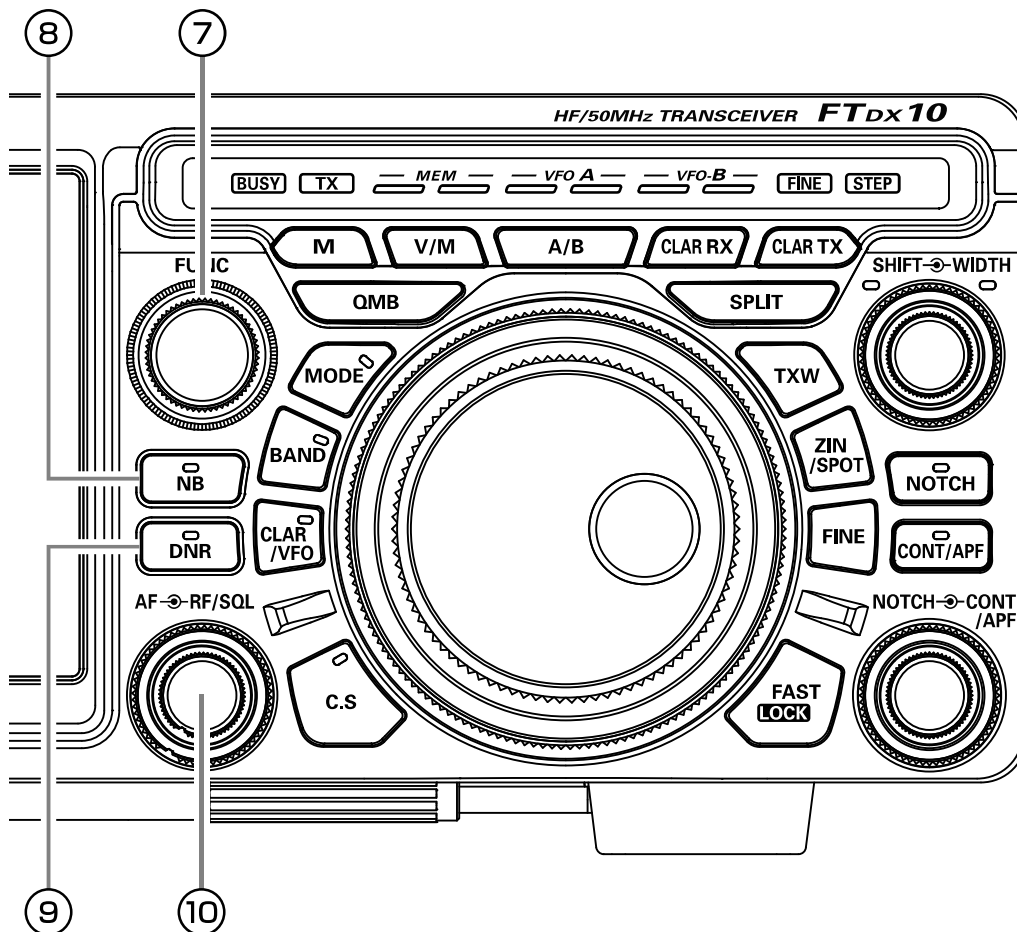
⑤ MIC

This 8-pin jack accepts input from a microphone utilizing a traditional YAESU HF transceiver pinout.



⑥ SD memory card slot

You can use the commercially available SD memory card to save various settings, save the memory contents, and update the firmware.



⑦ FUNC knob

Press the knob briefly to display the function menu screen where the operation settings for a variety of functions may be configured. Press this key again to close the function menu screen.

⑧ NB

This switch engages the IF Noise Blanker. When the Noise Blanker is activated, the LED inside the key will glow orange.



The noise blanker level can be adjusted by turning the [FUNC] knob after pressing and holding the [NB] key.

⑨ DNR

This key turns the Digital Noise Reduction circuit on and off. When the Digital Noise Reduction is activated, the LED inside the key will glow orange.



The noise reduction level can be adjusted by turning the [FUNC] knob after pressing and holding the [DNR] key.

⑩ AF, RF/SQL

Inner Knob (AF)

The inner [AF] knob sets the audio level of the receiver.

Outer Knob (RF/SQL)

RF

The RF Gain control provides manual adjustment of the gain levels for the receiver RF and IF stages, to account for noise and signal strength conditions at the moment.

[RF] knob is normally left in the fully clockwise position.



Before operation, set the operation of the [RF/SQL] control to "RF" (see below). The default setting is "RF".

It does not operate in FM and DATA-FM mode.

SQL

The squelch system allows the back-ground noise to be muted when no signal is being received.

Normally, the squelch is not used during SSB or CW operation.



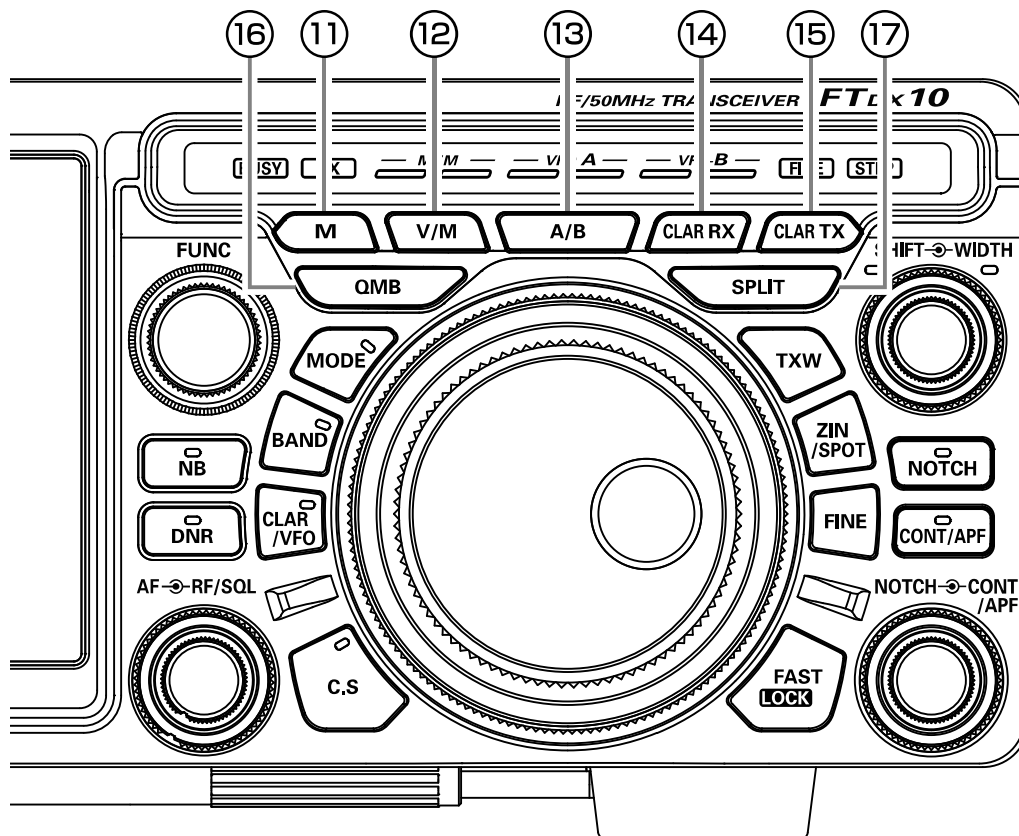
Before operation, set the operation of the [RF/SQL] control to "SQL". The default setting is "RF".

It does not operate in FM and DATA-FM mode.

Rotate the [RF/SQL] knob to adjust the squelch until the noise disappears.



If the squelch knob is turned too far to the right, weak signals cannot be heard.



11 M

Save data such as frequency set with VFO to the memory channel. Press and hold the [M] key → rotate the [MULTI] key to select channel → press and hold the [M] key, the data will be written to the memory channel.

12 V/M

This key toggles frequency control between VFO and the memory system.

13 A/B

This

14 CLAR RX

Pressing this key activates the RX Clarifier. This will allow you to temporarily adjust the receive frequency up to ±9.990 kHz with the MPVD knob. Press this key once more to return the receiver to the original frequency; the Clarifier offset will be remembered, in case you want to use it again.



To cancel the Clarifier offset, press and hold the [CLAR/VFO] key.

15 CLAR TX

Pressing this key activates the TX Clarifier. This will allow you to temporarily adjust the transmit frequency up to ±9.990 kHz with the MPVD knob.



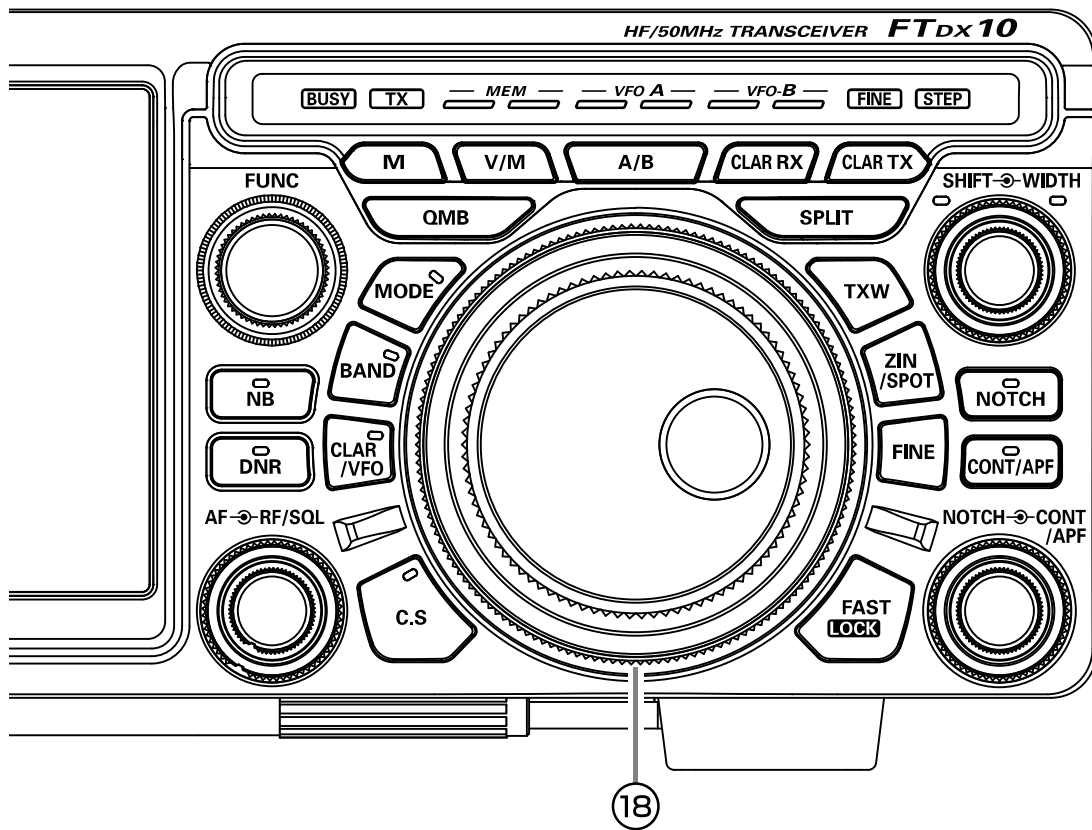
To cancel the Clarifier offset, press and hold the [CLAR/VFO] key.

16 QMB

Pressing the [QMB] key copies the contents (frequency, mode, bandwidth, FM repeater offset, and CTCSS settings), into consecutive QMB Memories.

17 SPLIT

Press this key to operate split frequency between MAIN band (used for reception) and SUB band (used for transmission). Press and hold in the [SPLIT] key for one second, the “Quick Split” feature will be engaged. SUB band transmit will automatically be set to a frequency 5 kHz higher than the MAIN band receive frequency, with the same operating mode. The transceiver will operate in the Split mode.



⑱ MPVD ring

Select the MPVD operation by touching one of the keys: MODE dial, BAND dial, CLAR (Clarifier), C.S (Custom Select).

Change the function of the MPVD ring

The function of the MPVD ring can be changed simply by pressing the key below.

MODE

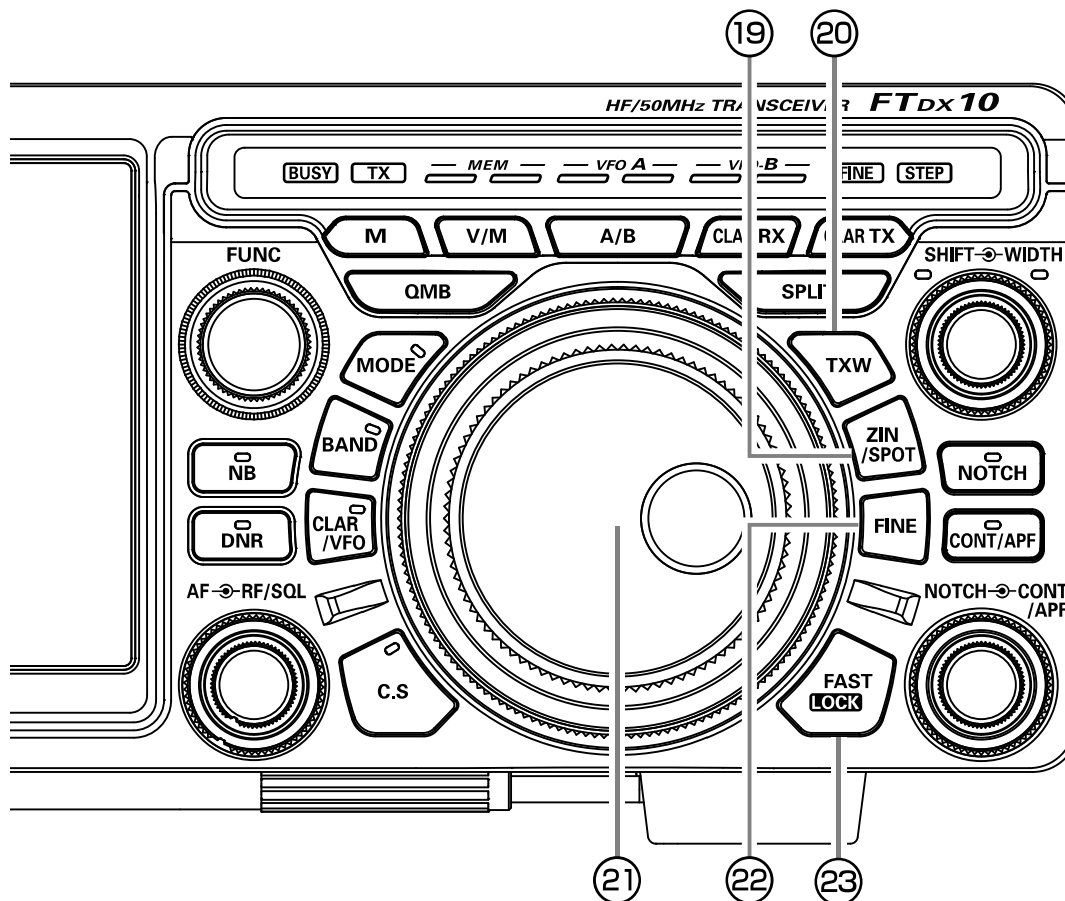
BAND

CLAR (Clarifier)

C.S (Custom Select key)

MPVD ring

MODE: Switch the radio modulation form (operating mode).
 BAND: Select the operation band.
 CLAR: Acts as a clarifier knob.
 C.S: 16 types of functions can be assigned in advance.



19 ZIN/SPOT

ZIN

Press [ZIN/SPOT] to cause the receiving frequency to zero-in automatically while receiving the CW signal.

SPOT

Pressing and holding [ZIN/SPOT], the tone is output from the speaker.

20 TXW (TX Watch)

Pressing and holding this button lets you monitor the transmit frequency when split frequency operation is engaged. Release the button to return to normal split frequency operation.

21 MAIN dial

This large knob adjusts the operating frequency. Clockwise rotation of this knob increases the frequency.

22 FINE

When pressed, MAIN dial will operate as FINE TUNING dial which changes the frequency at 1 Hz step (10 Hz steps in AM, FM, DATA-FM mode).

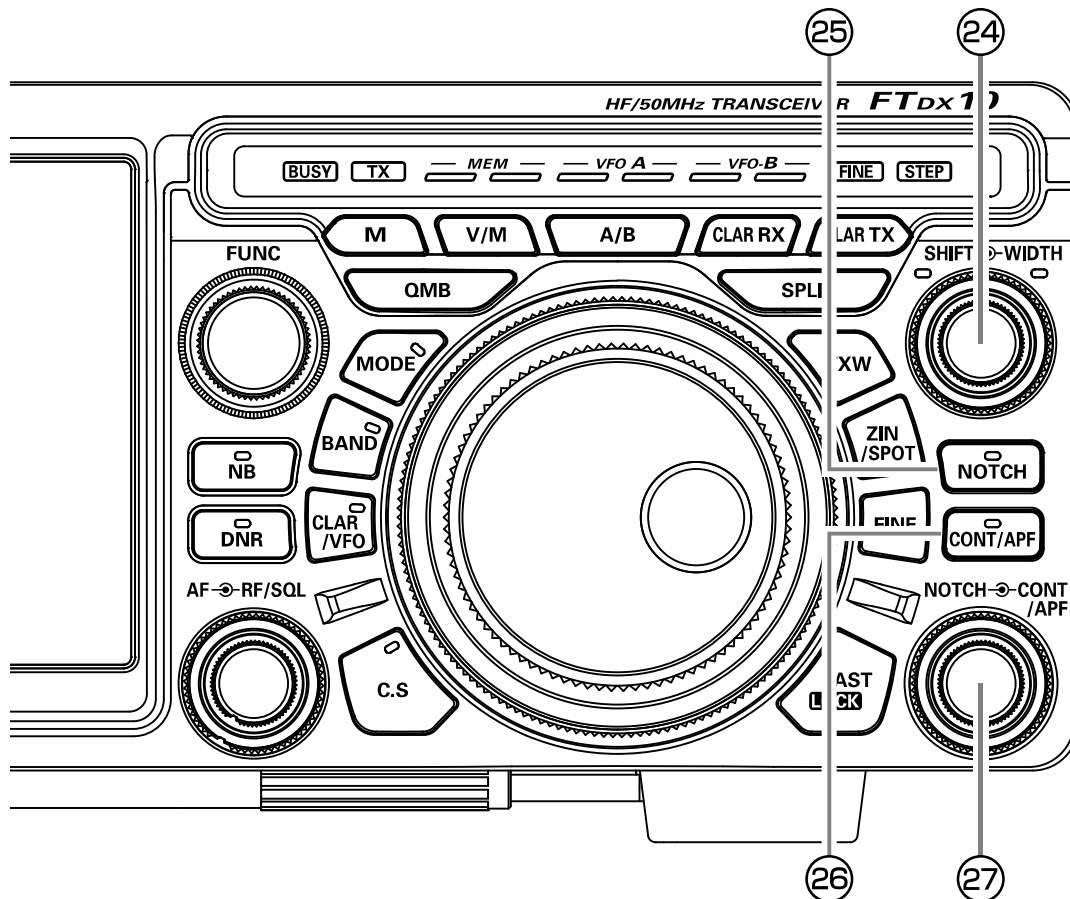
23 FAST/LOCK

FAST

Pressing this key will change the tuning of the MAIN Dial knob to a higher step rate.

LOCK

Press and hold this key toggles locking on/off for the MAIN Dial knob. With "Lock" on, the MAIN Dial knob can still be turned, but the frequency will not change, and the "LOCK" appears in the frequency display.



②④ SHIFT, WIDTH

Inner Knob (SHIFT)

Rotate the inner [SHIFT] knob to move the passband of the IF DSP filter by 20 Hz steps. The total adjustment range is ± 1.2 kHz. The position of the passband can be observed on the display. Furthermore, the display will show the shift value of the IF SHIFT for 2 second whenever the [SHIFT] knob is turned.

Outer Knob (WIDTH)

Rotate the outer [WIDTH] knob to set the overall bandwidth of the IF DSP filter. Counter-clockwise rotation reduces the bandwidth, while clockwise rotation increases the bandwidth. The current bandwidth can be observed on the display. Furthermore, the frequency display will show the bandwidth of the IF passband for 2 second whenever the [WIDTH] knob is turned.

②⑤ NOTCH

Pressing this key allows you to adjust the center frequency of the IF Notch filter using the [NOTCH] knob. While activated, the LED inside this key glows orange.

②⑥ CONT/APF

Pressing this key allows you to select the DSP Contour filter response using the [CONT/APF] knob. While activated, the LED inside this key glows orange.

②⑦ NOTCH, CONT/APF

Inner Knob (NOTCH)

Rotate the inner [NOTCH] knob to adjust the center frequency of the IF NOTCH filter. Press the [NOTCH] key to turn the IF NOTCH filter ON or OFF.

The null position of the IF NOTCH filter can be observed on the display.

Additionally, the display will show the center frequency of the IF NOTCH filter for 2 second whenever the [NOTCH] knob is turned.

Press and hold to reset NOTCH, CONTOUR, APF.

Outer Knob (CONT/APF)

The DSP CONTOUR operation can alter the profile of the passband to partially attenuate an in-band frequency component.

The CONTOUR operation can be switched ON/OFF with the [CONT] Key.

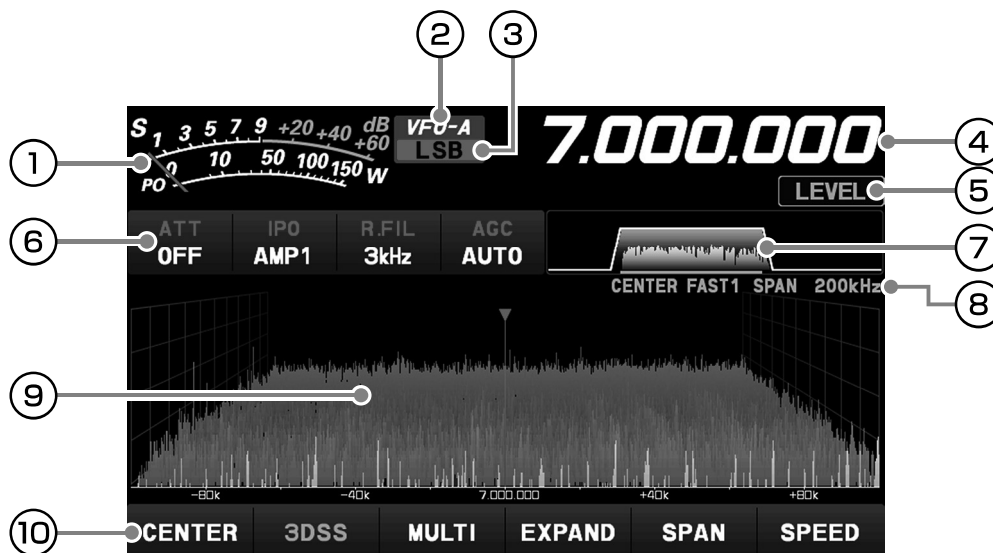
The influence of CONTOUR is depicted graphically on the display.

If there is interference or noise during CW operation, the APF center frequency is automatically set to the CW PITCH frequency as a "peak filter", to make it easier to hear the desired signal.

APF operation is switched ON/OFF with the [APF] key.

The location of the APF peak frequency is graphically illustrated on the display.

Display indications



① Meter

There are seven functions multi-meter. The bottom selection in the list below are transmit functions.

PO: Indicates the RF Power Output, from 0 to 150 Watts on transmit.

COMP: Indicates the compression level of the speech processor, from 0 to 20 dB.

ALC: Indicates the relative ALC voltage.

VDD: Indicates the final amplifier drain voltage.

ID: Indicates the final amplifier drain current

SWR: Indicates the antenna system observed-standing wave ratio (SWR), from 1.0 to 5.0.

② VFO mode/MEMORY mode

VFO-A: Displayed in VFO-A mode.

VFO-B: Displayed in VFO-B mode.

M-xx: Displays the selected channel number when in memory mode.

③ Operating Mode

Displays the current operating mode.

④ Operation Frequency

Displays the current operation frequency.

⑤ FUNC Knob Operations

Displays the functions operated with the FUNC knob.

⑥ Receive operation status indication

Displays the operation status of each reception function.

ATT: Indicates the attenuation level, selected [ATT] on the display.

IPO: Indicates which front end RF amplifier is selected [IPO] on the display.

R.FIL: Indicates the bandwidth of the currently selected roofing filter.

AGC: Indicates the AGC decay time setting, which is selected [AGC] on the display.

⑦ Filter Display

This indicator is used for viewing the status of the DSP (CONTOUR, NOTCH, WIDTH and SHIFT).

⑧ Scope Screen information display

CENTER: The receive frequency is always shown at the center of the screen and spectrum display..

CURSOR: Monitors the spectrum within the range set with "SPAN".

FIX: To use Fixed Mode, enter the start frequency of the scope.

FAST1-3: Sweep speed (FAST1 to FAST3)

SLOW1-2: Sweep speed (SLOW1 to SLOW2)

SPAN xxxkHz

Scope Screen frequency span (display range)

⑨ Scope Screen

Display spectrum and waterfall useful for monitoring situations in the band.

⑩ Scope display setting

CENTER / CURSOR / FIX:

Switches the Spectrum Scope operation each time the key is touched.

3DSS: Switch between the 3DSS display and the waterfall display.

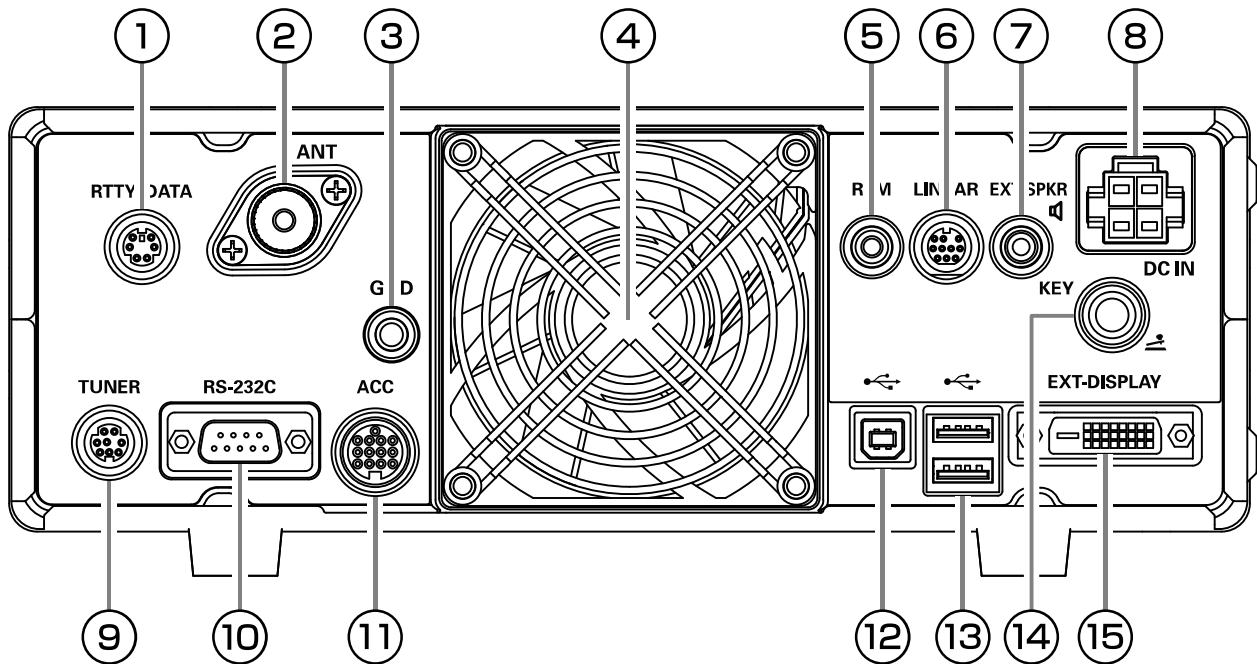
MULTI: In addition to the scope display, the oscilloscope and AF-FFT are also presented.

EXPAND: The display area of the scope screen may be ex-panded vertically.

SPAN: Set the frequency span (display range) of the scope screen.

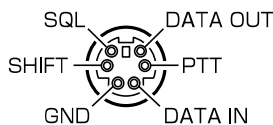
SPEED: Sets the Scope Display sweep speed

Rear Panel



① RTTY/DATA

This 6-pin input/output jack accepts AFSK input from a Terminal Node Controller (TNC); it also provides fixed level receiver audio output, and FSK keying line.



② ANT

Connect your main antenna here, using type-M (PL-259) connectors and coaxial feed lines. The internal antenna tuner affects only the antenna connected here, and only during transmission.

③ GND

Use this terminal to connect the transceiver to a good earth ground, for safety and optimal performance. Use a large diameter, short braided cable to make ground connections.

④ Cooling FAN

⑤ REM

By plugging the FH-2 Remote Control Keypad into this jack, direct access to the FTDX10 CPU is provided for control functions such as contest memory keying, plus frequency and function control.

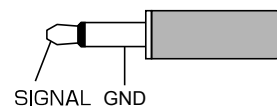
⑥ LINEAR

This 15-pin output jack provides band selection data, which may be used for control of optional accessories such as the VL-1000 Solid-state Linear Amplifier.

⑦ EXT SPKR

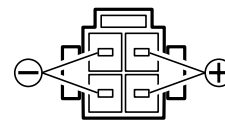
This 3.5-mm, 2-contact, jack provides variable audio output for an external loudspeaker. The audio output impedance at this jack is 4 - 8 Ohms, and the level varies according to the setting of the front panel [AF] knob.

! Inserting a plug into this jack disables the internal loudspeaker.



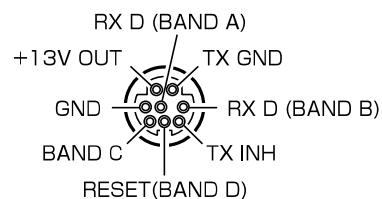
⑧ DC IN

This is the DC power supply connection for the transceiver. Use the supplied DC cable to connect directly to a DC power supply, which must be capable of supplying at least 23 A @13.8 VDC.



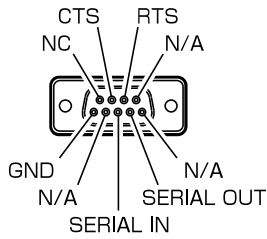
⑨ TUNER

This 8-pin output jack is used for connection to the FC-40 External Automatic Antenna Tuner.



⑩RS-232C

This 9-pin serial DB-9 jack allows external computer control of the FTDX10. Connect a serial cable here and to the RS-232C COM port on your personal computer (no external interface is required).



⑪ACC

This 13-pin jack for connecting optional accessories.

⑫USB

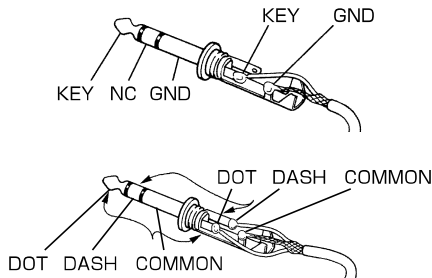
Connecting to a computer from this jack using a commercially available USB cable allows remote control by CAT commands from the computer.

⑬USB

Connect a USB A type keyboard or mouse. They can be used to select items on the screen or to enter characters.

⑭KEY

This 1/4-inch 3-contact jack accepts a CW key or keyer paddle. A two-contact plug cannot be used in this jack.



⑮EXT-DISPLAY

DVI-D connector for connecting an external monitor.

When using an external monitor, set the setting menu item "EXT DISPLAY" to "ON".

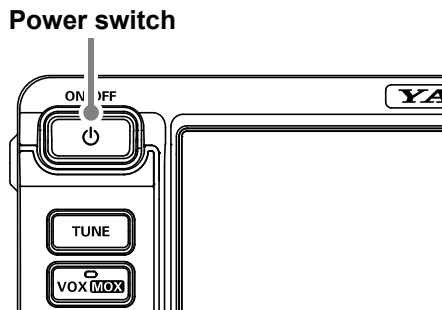


Connect a monitor that supports 800 x 480 resolution or 800 x 600 resolution.

Basic Operation

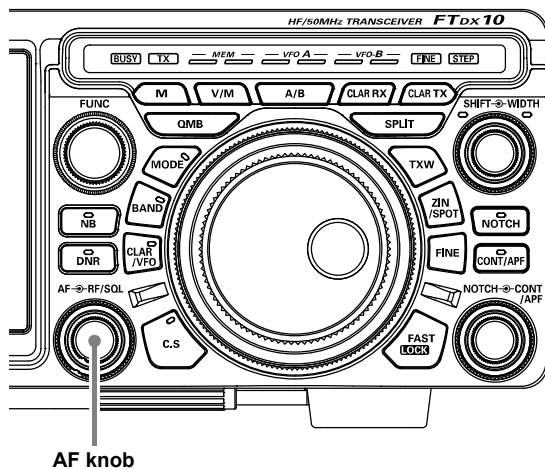
Turning the Transceiver ON and OFF

Press and hold the Power switch to turn the transceiver ON or OFF.



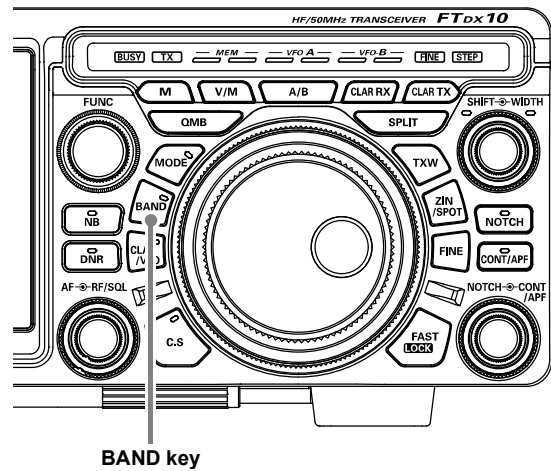
Adjusting the Audio Volume Level

Rotate the [AF] knob to adjust the volume to a comfortable level.



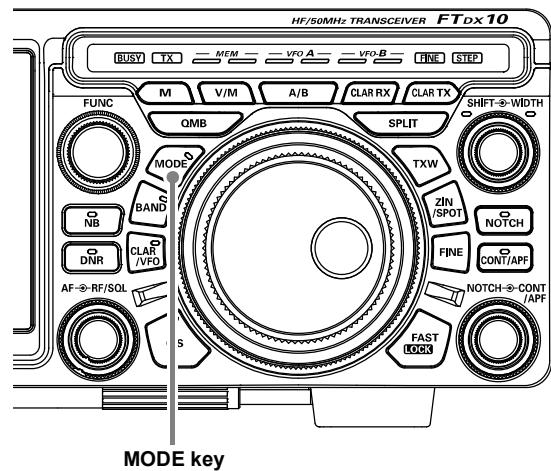
Operating Band Selection

Press the BAND key to display the operation band selection screen, then touch and select the desired band.



Operating Mode Select

Press the MODE key to display the operation mode selection screen, then touch and select the desired mode.



Setting the Operating Frequency

Setting Frequency with the MAIN Dial

Rotate the MAIN dial knob to tune within the band, and begin normal operation.

- Pressing the [FAST] key engages the “Fast” tuning selection.

Tuning of 1 MHz or 1 kHz

1. Touch the “MHz” or “kHz” area of the frequency display.



2. Rotate the MAIN dial knob.
3. Touch “MHz” or “kHz” area of the frequency display to confirm.
 - If there is no operation within 3 seconds, the frequency will be fixed.

Touch screen tuning

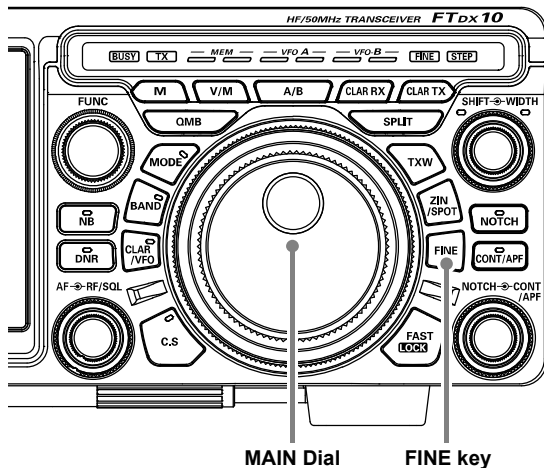
When the Scope Screen is touched, the frequency will be changed corresponding to the place on the display that is touched.

Tuning of 1 Hz (FINE TUNING)

In the SSB, CW, RTTY, DATA-L or DATA-U mode, the frequency can be adjusted with 1 Hz steps.

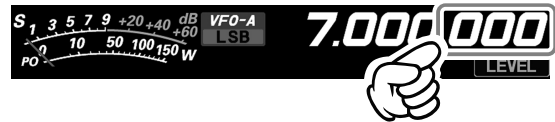
- AM, FM, DATA-FM modes may be adjusted in 10 Hz steps.

1. Press the [FINE] key.
2. Rotate the MAIN dial knob.

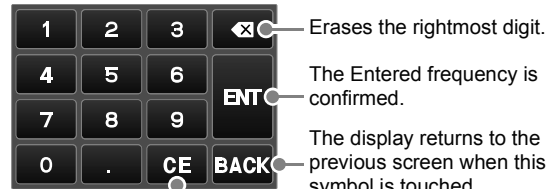


Keyboard Frequency Entry

1. Touch the “Hz” area of the frequency display.



2. Enter the frequency using the numeric keys.



Clear all entered numbers.

- If there is no operation within 10 seconds, the input will be canceled.

3. Touch [ENT] to confirm.

Setting with the [FUNC] knob

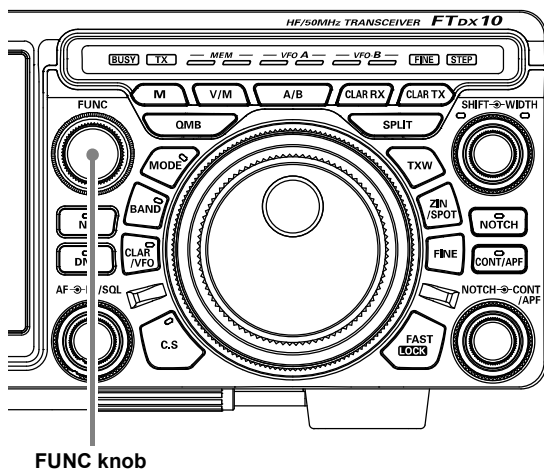
The [FUNC] knob may be set to adjust in preset steps.

1. Press the [FUNC] knob.
2. Touch [STEP DIAL].
3. Rotate the [FUNC] knob.
 - Pressing the [FAST] key engages the “Fast” tuning selection.

MIC Gain Adjustment

Turn the [FUNC] knob to adjust the microphone gain.

1. Press the [FUNC] knob.
2. Touch [MIC GAIN].
3. Rotate the [FUNC] knob to adjust the microphone gain.



FUNC knob

In the SSB mode

When transmitting in the SSB mode, adjust the MIC gain so that the ALC meter stays within the ALC zone of the meter on voice peaks.



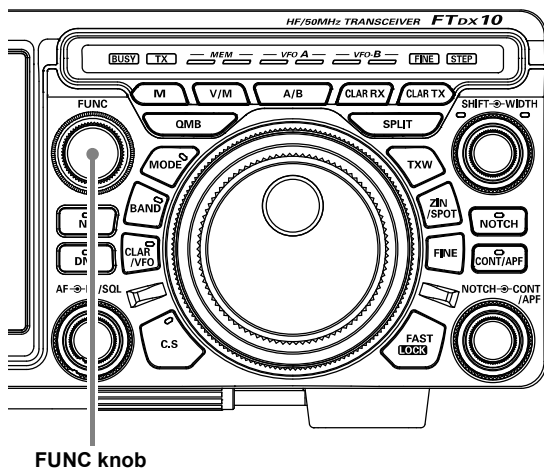
In the AM mode

When transmitting in the AM mode, adjust the MIC gain so that the ALC meter does not deflect on voice peaks.

RF Power output control

Turn the [FUNC] knob to adjust the RF power output.

1. Press the [FUNC] knob.
2. Touch [RF POWER].
3. Rotate the [FUNC] knob to adjust the RF power.



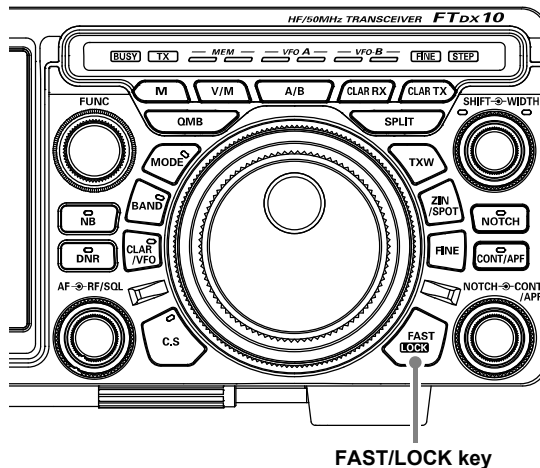
FUNC knob

DIAL knob Lock

The DIAL knob may be locked to prevent accidental frequency change.

To lock the DIAL knob, press and hold the [FAST/LOCK] key.

To unlock the DIAL setting, and restore normal tuning, press and hold the [FAST/LOCK] key again.



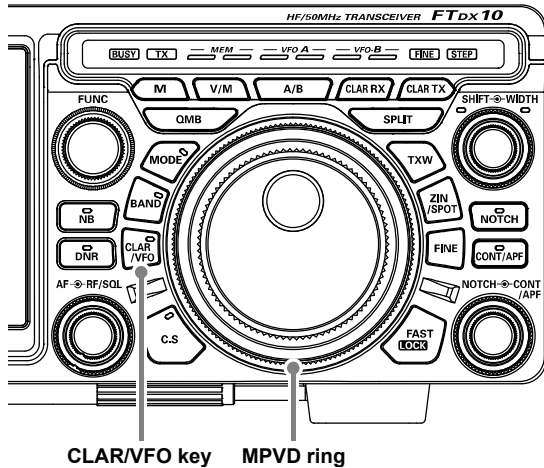
FAST/LOCK key

Receiver Accessories

CLAR (Clarifier) Operation

The [CLAR/VFO] key and MPVD Dial are used to offset the receive frequency from their settings on the VFO frequency.

1. press the [CLAR/VFO] key.
2. Rotation of the MPVD ring will allow you to modify your initial offset on the fly. Offsets of up to ± 9990 Hz may be set using the Clarifier.



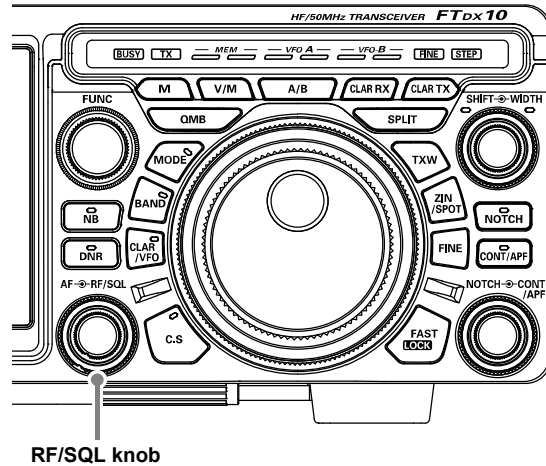
3. To cancel Clarifier operation, press the [CLAR/VFO] key.

To clear the Clarifier offset, and reset it to “zero”, press and hold the [CLAR/VFO] key.

RF Gain

The RF Gain control provides manual adjustment of the gain levels for the receiver RF and IF stages, to account for noise and signal strength conditions at the moment.

As the [RF/SQL] knob is rotated counterclockwise to reduce the gain, the S-meter reading will rise. This indicates that the AGC voltage being applied to the receiver is increasing (this causes a reduction in receiver gain).



AGC (Automatic Gain Control)

The AGC system is designed to help compensate for fading and other propagation effects. The AGC characteristics can be individually set for each operating mode. The basic objective of AGC is to maintain a constant audio output level once a certain minimum threshold of signal strength is achieved.

1. Touch [AGC].
2. Touch the desired receiver-recovery time constant.
 - The “AUTO” selection mode selects the optimum receiver-recovery time for the reception mode.

Operation Mode	AUTO AGC Selection
LSB / USB / AM / AM-N	SLOW
CW-L / CW-U / FM / FM-N / DATA-FM / D-FM-N	FAST
RTTY-L / RTTY-U DATA-L / DATA-U / PSK	MID

- For most operations, we recommend the “AUTO” mode.

CW Decode

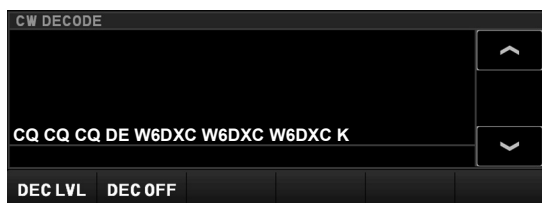
Alphanumeric Morse code can be decoded and displayed as text on the display.



Interfering signals, noise, propagation phasing, and code inaccuracy, may prevent accurate message copy.

1. Set the operating mode to CW.
2. Press the [FUNC] knob.
3. Touch [DECODE].

The CW DECODE screen is displayed, and the decoded message is displayed on the screen.



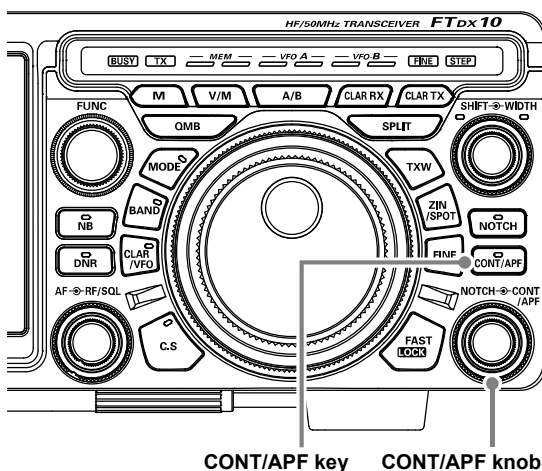
- If extraneous characters are displayed, due to noise and clutter when a CW signal is not being received, touch [DEC LVL] and then rotate the [FUNC] knob to adjust the threshold level.
4. To cancel the CW decode function, touch [DEC OFF].

Audio Peak Filter

During CW operation, when interference or noise is present, the center frequency is automatically set to the PITCH frequency, making it easier to hear the desired signal.

1. Rotate the [CONT/APF] knob to the left or right to reduce any interference.
 - Rotate the [CONT/APF] knob to display the center frequency (-250Hz - +250Hz) of the audio peak filter.
 - Press and hold the [CONT/APF] key to restore the APF peak center frequency setting to "0 Hz".

To exit from APF operation, press the [APF] key twice.



CW Spotting (Zero-Beating)

"Spotting" (zeroing in on another CW station) is a handy technique to ensure the transceiver and the other station are operating precisely on the same frequency.

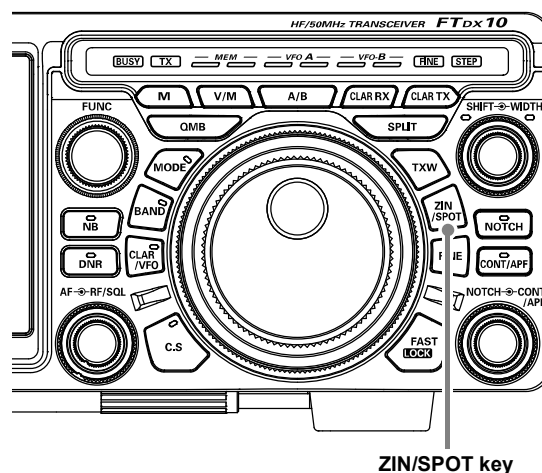
The Tuning Offset Indicator in the display may also be moved to adjust the receiver frequency to center on the incoming station with the CW pitch corresponding to that of the transmit signal.



Zero-In

Using the Auto Zeroing System

Press the [ZIN/SPOT] key momentarily to adjust the receiving frequency and zero-in automatically while receiving a CW signal.



ZIN/SPOT key

Using the SPOT System

1. Set the operating mode to CW.
2. While you are pressing and holding [ZIN/SPOT] key, the tone is output from the speaker.

CW Pitch Adjustment

The center frequency of the receiver passband may be adjusted to the CW tone you prefer.

1. Set the operating mode to CW.
2. Press the [FUNC] knob.
3. Touch [CW PITCH].
4. Rotate the [FUNC] knob to select the desired tone.
 - The tone may be varied between 300 Hz and 1050 Hz, in 10 Hz steps.

Interference Rejection

IPO (Intercept Point Optimization)

The IPO (Intercept Point Optimization) function can establish the gain of the RF amplifier section to accommodate the connected antenna and the received signal conditions. IPO can be selected from three operating conditions.

After touching [IPO], touch the desired operating condition.

IPO: Bypasses the RF preamplifier, yielding direct feed to the first mixer.

AMP1: Amplifies the incoming signals, using a low distortion RF preamplifier (gain: approx. 10dB).

AMP2: Amplifies the incoming signals, using a 2-stage low-distortion RF preamplifier (total gain: approx. 20 dB).

Contour Control Operation

The Contour filter system provides a gentle perturbation of the IF filter passband. The Contour is set to either suppress, or boost specific frequency components, and thus enhances the sound and readability of a received signal.

1. Rotate the [CONT/APF] knob to achieve the most natural-sounding audio reproduction on the incoming signal.
 - Rotate the [CONT/APF] knob, the center frequency (50 Hz - 3200 Hz) of the Contour is displayed.
 - Press and hold the [CONT/APF] key to return the center frequency to its initial value.
2. To exit from Contour tuning, press the [CONT/APF] key momentarily.

Adjusts the GAIN of the CONTOUR circuit

1. Press the [FUNC] knob.
2. Select [OPERATION SETTING] → [RX DSP] → [CONTOUR LEVEL].
3. Rotate the [FUNC] knob to set level of the gain of the CONTOUR circuit.
4. Press the [FUNC] key to save the new setting.

Sets the bandwidth ("Q") of the CONTOUR circuit.

1. Press the [FUNC] knob.
2. Select [OPERATION SETTING] → [RX DSP] → [CONTOUR WIDTH].
3. Rotate the [FUNC] knob to set bandwidth ("Q") of the CONTOUR circuit.
4. Press the [FUNC] knob to save the new setting.

