The radio... YAESU

HF/50MHz TRANSCEIVER

FTDX10



Hybrid SDR
The Birth of the New Standard

2kHz RMDR : 116 dB+
2kHz BDR : 141 dB+
2kHz 3rd IMDR : 109 dB+
(14MHz band/2kHz Separation)

HF/50MHz TRANSCEIVER
FTDX10 100W

Hybrid SDRs (Narrow Band SDR & Direct Sampling SDR)

15 Separate Powerful Band Pass Filters

9MHz Down Conversion Receiver Configuration

IF Roofing Filters Produce Excellent Shape Factor

250MHz HRDDS: Ultra Low-Noise Local Oscillator System

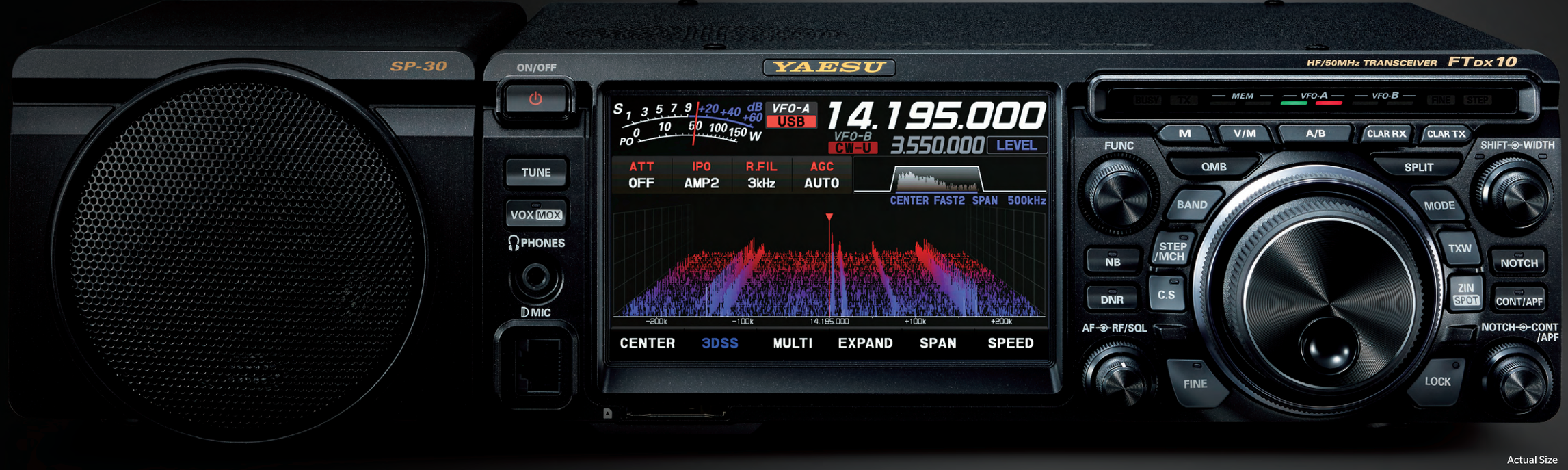
Yaesu Renowned Interference Reduction System

5-inch TFT Color Touch Panel with 3DSS Visual Display

Transmit Signal Purity

MPVD (Multi-Purpose VFO Outer Dial) enables Outstanding Operating Performance

Remote Operation with LAN or Internet *(LAN unit optional)



Actual Size

Supplied Accessories: Hand Microphone SSM-75E, DC Power cable
***External Speaker SP-30: Optional**

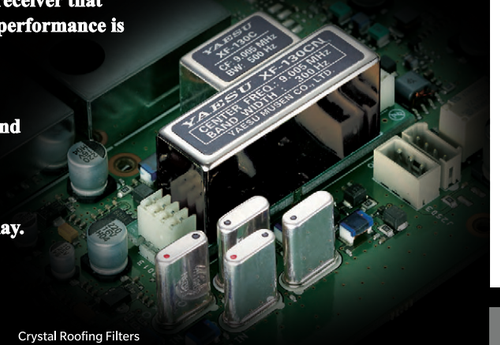
Hybrid SDR with Ultimate Receiver Performance

Hybrid SDR (Narrow band SDR & Direct Sampling SDR)

The FT DX 10 uses a hybrid SDR configuration, integrating a direct sampling SDR receiver that enables viewing the entire band status in real time. The excellent dynamic receiver performance is achieved by the narrow band SDR receiver circuit.
The Narrow band SDR receiver removes strong out of band signals using the superheterodyne method, with narrow band roofing filters which significantly attenuate out of band frequency components. The wanted signals within the passband are converted to digital by a high-resolution A/D converter, and then sent to an FPGA (Field Programmable Gate Array) for signal processing.
The Direct Sampling SDR driving the real time spectrum scope with its great dynamic range, enables the weakest signal to be observed on the display.

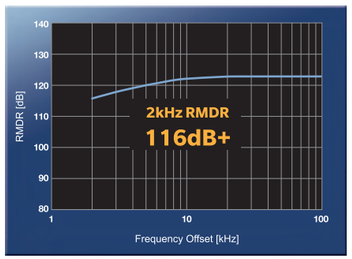

Narrow band SDR A/D Converter


FPGA

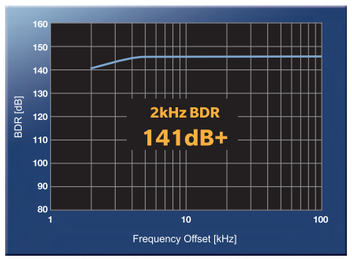


Crystal Roofing Filters

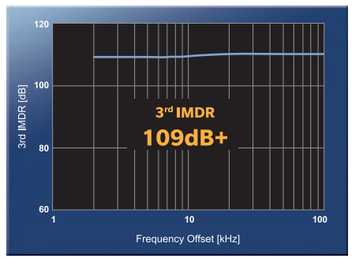
Crystal Roofing Filters Enable Phenomenal Multi-signal Receiving Characteristics



14MHz Band Reciprocal Mixing Dynamic Range (RMDR)



14MHz Band Blocking Dynamic Range (BDR)

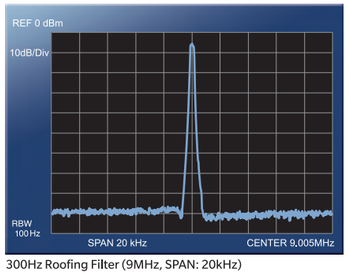


14MHz Band 3rd Intermodulation Dynamic Range (IMDR)

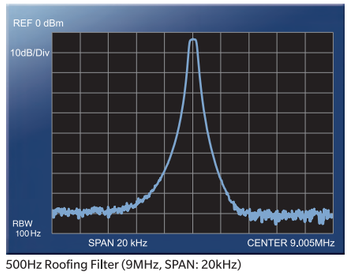
The down-conversion receiver configuration is similar to the FTDX101. The double switched mixer, which is excellent in intermodulation characteristics and has a low noise figure, is adopted. Narrow band SDR configuration with the first IF at 9MHz makes it possible to use excellent narrow bandwidth crystal roofing filters that have the desired sharp cliff edge shape factor. The roofing filters enable the amazing multi-signal receiving performance demanded when faced with the most challenging on-the-air interference situations.

In conjunction with the down-conversion configuration, the FTDX10 has adopted an outstanding low-noise Local Oscillator and the latest circuit configuration where all circuit elements are carefully selected. As a result, the close-in RMDR (Reciprocal Mixing Dynamic range) in the 14 MHz band reaches 116 dB or more, BDR (Blocking Dynamic Range) reaches 141 dB or more, and the 3rd IMDR (third-order Intermodulation Dynamic Range) reaches 109 dB or more.

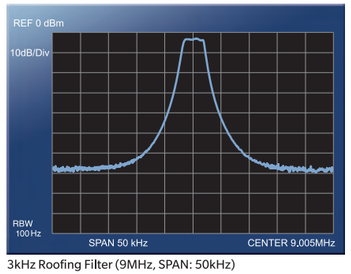
* 500Hz, 3kHz, 12kHz crystal roofing filters included * 300Hz crystal roofing filter: Optional



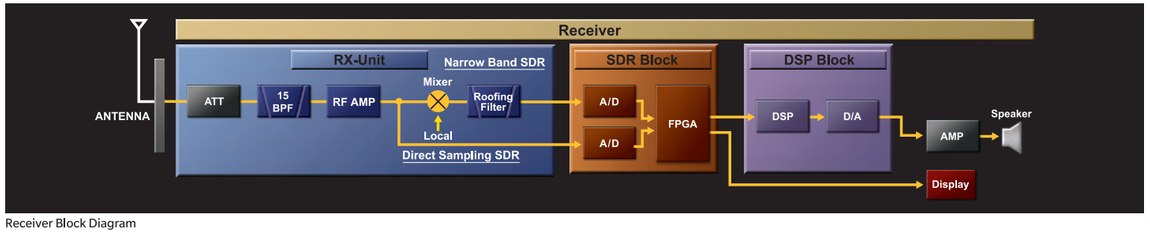
300Hz Roofing Filter (9MHz, SPAN: 20kHz)



500Hz Roofing Filter (9MHz, SPAN: 20kHz)



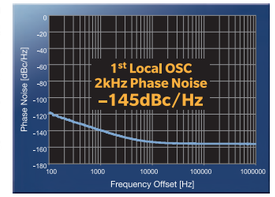
3kHz Roofing Filter (9MHz, SPAN: 50kHz)



Receiver Block Diagram

Ultra-Low-Noise Local Signal Generated by the 250MHz HRDDS (High Resolution Direct Digital Synthesizer)

The C/N ratio (carrier-to-noise ratio) of the local oscillator signal that is injected into the 1st mixer, is an important factor in improving the close-in multi-signal receiver characteristics. The local circuit of the FTDX10 utilizes the 250MHz HRDDS (High Resolution Direct Digital Synthesizer) method. In this circuit configuration the SDR module creates a local signal by directly dividing the 250MHz high frequency. The theoretical PLL lockup time becomes zero, and C/N deterioration by the lockup time does not occur. The significant improvement of the C/N characteristic by directly dividing the frequency, contributes dramatically to reduction of noise in the entire receiver stage. In the FTDX10, the latest circuit design with the 250MHz HRDDS and the careful selection of components, results in the phase noise characteristic of the local signal achieving an excellent value of –145 dBc/Hz or less at 2kHz separation (14MHz band).



1st Local OSC Phase Noise (14.2MHz)

15 Separate (HAM 10+GEN 5) Powerful Band Pass Filters

There are 15 band pass filters (BPF) between the attenuators and the RF amplifier stages. These are divided into 10 Band Pass Filters dedicated to the amateur bands and 5 Filters dedicated to the General coverage receives (GEN).
Band Pass filters are automatically selected according to the frequency band, to eliminate out-of-band unwanted signals and send the desired signal to the RF amplifier.


15 Separate Band Pass Filters

Effective QRM Rejection Afforded by IF DSP

The 32-bit high speed floating decimal point DSP, TMS320C6746 (maximum 2949 MIPS/ 2220 MFLOPS) produced by Texas Instruments, is used for the IF section of the FT DX 10.
The signal processor operates at 368.64 MHz clock frequency.
Yaesu's Renowned Interference Reduction Systems: SHIFT / WIDTH / NOTCH / CONTOUR / APF (Audio Peak Filter) / DNR (Digital Noise Reduction) / NB (Noise Blanker) controls are all accessed from the front panel.

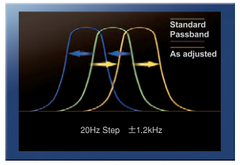


IF DSP
Operating Status Display

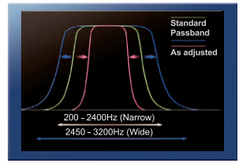


IF SHIFT / IF WIDTH

IF SHIFT: Without changing the bandwidth, the pass band relative position can be moved, so that harmful signals are rejected from the low or high side of the pass band.
IF WIDTH: By adjusting the bandwidth, Interfering signals can be removed from both sides of the pass band, without changing the pass band position
Reception can also be improved by choosing to narrow the bandwidth of the IF WIDTH function, and then varying the pass band with the IF SHIFT.



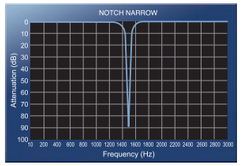
IF SHIFT Conceptual Illustration



IF WIDTH Conceptual Illustration

IF NOTCH / DNF (AUTO NOTCH)

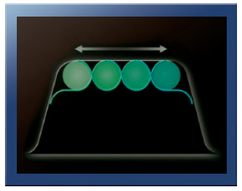
The IF NOTCH features a very high "Q", and produces a deep narrow notch, that effectively removes a strong beat signal.
The DNF (Digital Notch Filter) automatically follows the interfering heterodyne signals, even if there are more than one, and even if the beat frequency changes with time.



IF NOTCH

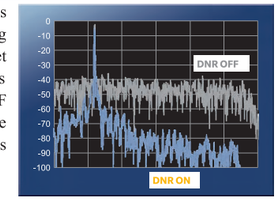
CONTOUR

The CONTOUR function varies the shape of the IF DSP filter pass band characteristics, and the in-band signal attributes can be partially altered.
Unlike the IF SHIFT or IF WIDTH controls which operate on the whole passband, the CONTOUR control can be made to change specific sectors of the pass band, it can be used as an audio control.


CONTOUR Conceptual Illustration

DNR (Digital Noise Reduction)

The digital noise reduction circuit provides 15 separate parameters. Optimal working point noise reduction constants may be set by selecting the 15 step parameters according to the actual noise within the HF band. The desired signal components are peaked and the random noise components are effectively cancelled.



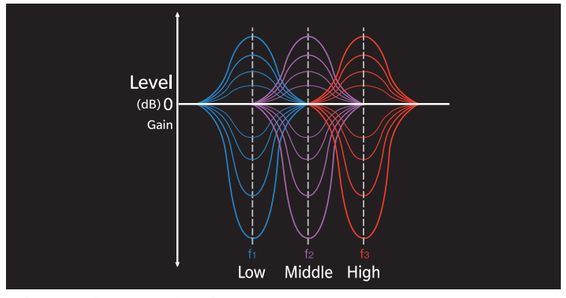
DNR (Digital Noise Reduction)

APF (Audio Peak Filter)

In the CW mode, the included APF (Audio Peak Filter) develops an audio peak at the signal frequency; this improves the S/N and increases the readability of the CW signal. The APF peak frequency can be finely aligned.

3-Stage Parametric Equalizer

The 3-stage parametric equalizer tunes the low / middle / high frequencies of the received audio, and is tailored for each AM / SSB / FM mode.
The audio level of each stage can be tuned to create the best possible operating conditions.

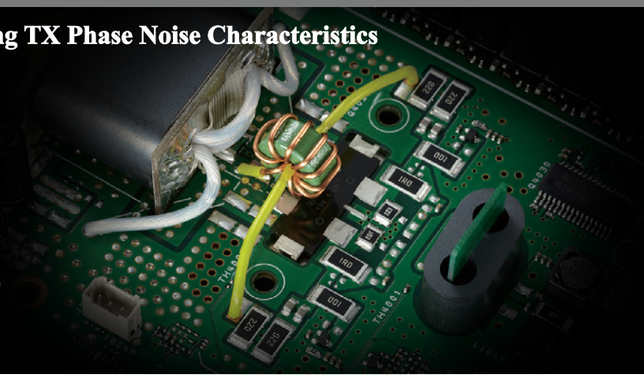


3-Stage Parametric Equalizer Conceptual Illustration

Transmit Signal Purity

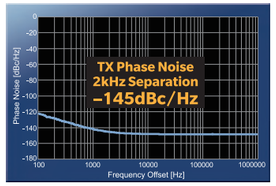
High-Purity Transmission Signal with Outstanding TX Phase Noise Characteristics

The excellent C/N characteristics provided by the 250MHz HRDDS used in the local oscillator circuit also influences the transmitter section.
For the FT DX 10, a thorough examination of each element up to the final TX stage was made. From the clock-distributor that divides and distributes the local signal of the 250MHz HRDDS circuit to each block, the FPGA, the D/A converter, to the final Power Amplifier etc., the latest circuit configurations were carefully selected to improve the C/N characteristics of the entire transmitter block.



Outstanding Transmit Phase Noise Characteristics

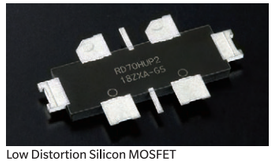
Based on the high-quality local signal generated by 250MHz HRDDS, the transmit signal of the FTDX10 is directly generated from a 16-bit D/A converter, therefore distortion and noise are significantly suppressed and C/N of the entire TX block is improved. As a result, the transmission phase noise characteristics achieve –145 dBc/Hz at 2kHz separation.



TX Phase Noise
(14MHz band, TX:100W, Mode:CW)

High-Power & Stable Final Amplifier

The transmit final power amplifier section utilizes a newly developed push-pull type Silicon MOSFET RD70HUP2, which is a small package with two MOS FETs, and has excellent linearity, low distortion, and stable 100W high output, even at low voltage.



Low Distortion Silicon MOSFET

A large Aluminum Heat Sink with Low-Noise Cooling Fan

The large aluminum die-cast chassis ensures a stable high-power output, even in continuous transmission modes and operation under harsh environments. In addition, an 80mm axial-flow cooling fan for the final amplifier is mounted at the rear. In prolonged operation, the temperature rise inside the cabinet is detected, and the fan starts. The rotation speed is automatically adjusted, depending on the temperature. The cooling fan uses a large bearing motor with low-noise and rotates at low speed, thereby minimizing the acoustic noise during quiet nighttime operation.

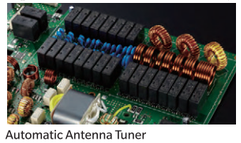

large aluminum die-cast chassis



ø80mm Low-Noise Cooling Fan

High Speed Automatic Antenna Tuner

The FTDX10 internal antenna tuner uses microprocessor-controlled LC relay switching. Tuning data is automatically retained in a large capacity 100 channel memory. When changing frequency, the optimized antenna tuning data is immediately recalled to reduce tuning time, and realize the best matching point.

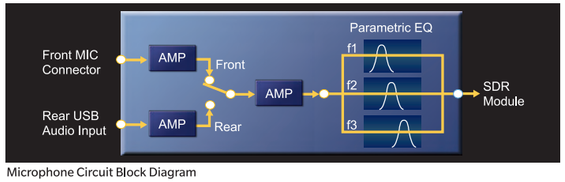

Automatic Antenna Tuner

RF & AF Transmit Monitor

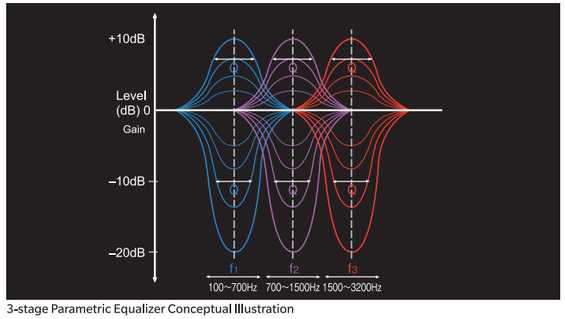
The RF spectrum of the final amplifier transmit signal is displayed on the scope screen; it is possible to visually confirm the quality of the actual emitted transmit signal. On the MULTI screen display, the RF spectrum of the audio transmit signal (AF-FFT display), and the oscilloscope, can be simultaneously displayed on one screen. The effect of adjusting the speech processor and parametric equalizer can also be observed.

Microphone Amplifier
Three-Stage Parametric Equalizer (SSB/AM mode)

The modulation circuit of the FTDX10 utilizes a three-stage parametric equalizer that makes possible versatile digital variations of the TX audio quality, by shaping the TX band audio spectrum. The parametric equalizer can alter the Low, Mid and High audio frequencies separately. This three-stage parametric equalizer can generate high quality TX audio sound, because it can be finely tuned without sacrificing the audio integrity.



Microphone Circuit Block Diagram



3-stage Parametric Equalizer Conceptual Illustration

Yaesu Renowned Speech Processor

The SSB Speech Processor uses IF digital signal processing to increase the intelligibility of the transmitted signal during weak signal crowded conditions. The DSP increases the average power of the important speech spectrum components, and reduces the TX power of the less significant components. The compression level may be adjusted with the dial on the front panel to adapt the transmitted SSB signal to best suite the situation, propagation conditions and pile-up.

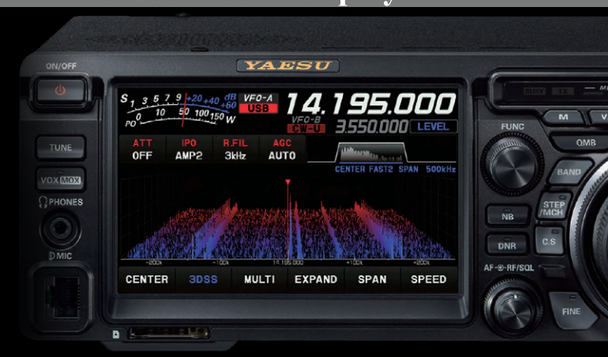
Excellent Visibility & Touch Panel Operation with 3DSS Visual Display

5-inch TFT Color Touch Panel Display

The large wide full-color touch panel display, affords intuitive management of operating frequency, meters and main function settings.

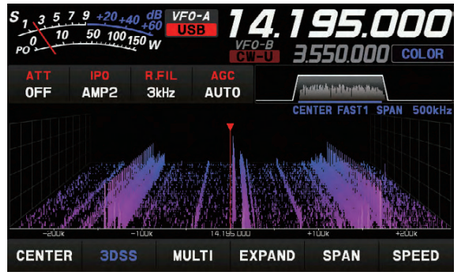
5-inch TFT Color Display
Size: 5-inch Wide
Resolution: 800 × 480 pixels
[Scope Specifications]
Sweep speed: 30 FPS (Approximately)
Display Range: 100 dB
Span width: 1-1000 kHz

3DSS
3D Spectrum Stream



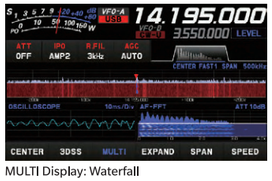
3DSS (3-Dimensional Spectrum Stream)

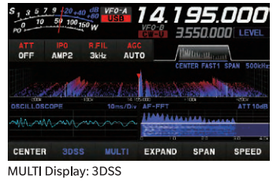
The 3DSS presents the constantly changing band conditions in three dimensions (3-D) with the frequency as the horizontal axis (X axis), the signal strength as the vertical axis (Y axis), and the time as the Z axis. The signal strength flows in time to the rear of the screen. The operator can intuitively view the constant changes in a signal's strength.



MULTI Display

The MULTI Display mode allows the oscilloscope and the AF-FFT audio scope to be shown on the screen, in addition to the RF Spectrum Scope display. In MULTI display, while monitoring the receive band, a simultaneous view of the contact station's transmit signal audio characteristics can be viewed with the AF-FFT function. At the same time the IF filter and interference reduction functions can be observed on the MULTI display for their influence on the receive signal, even in the contest fray, etc.


MULTI Display: Waterfall


MULTI Display: 3DSS

Receiver Operation Status Display

The status of important receiver operations, such as attenuator, RF gain and roofing filters are shown on the display, where they can always be confirmed. To change a setting, touch it, and then select the appropriate type or value on the display. The filter displays show in-band information as well as the operation status of the interference reduction function.



Versatile Touch Panel Operation

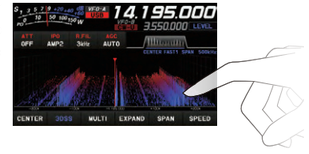
Efficiently Change settings and tune the frequency by touching the image on the display panel.

Analog Meter / Mode Select
Analog meter, Mode, and Operating Frequency are shown in the upper part of the TFT Color Touch Panel Display. Easily touch the desired image to reveal a menu and then select the mode, and meter that operates during transmission.

Frequency Direct Entry
In addition to the frequency changes performed by the VFO dial, the FTDX10 supports ten key frequency input using the keypad that is displayed by touching the TFT Panel frequency display section.



Instant Frequency Setting by Scope screen
The transceiver frequency can be instantly changed to match a signal shown on the scope screen display by touching the peak of the desired signal.



Versatile Scope Operating Modes

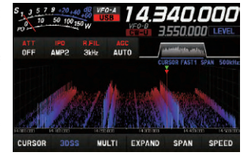
Center Mode (CENTER)
This mode is convenient to monitor the spectrum around the operating frequency.
The receive frequency is always shown at the center of the screen and is displayed within the range set by "SPAN".



FIX Mode (FIX)
The FIX mode is convenient when operating within a fixed band. By pressing and holding the "FIX" key, the start frequency of the scope may be input. Then set the "SPAN" according to the band plan to monitor the fixed range.



Cursor Mode (CURSOR)
Monitors the spectrum within the range set with "SPAN", the same as FIX mode. When the frequency (marker) is moved beyond the upper or the lower limit of the range, the screen is automatically scrolled and the spectrum outside the setting range can be observed.



Front Panel Delivers Superior Operability and Visibility

The 5-inch TFT color touch panel display provides intuitive operation and outstanding visibility. Important primary operating functions are arranged near the VFO dial for instant access.



MPVD (Multi-Purpose VFO Outer Dial)

The large MPVD multi-purpose dial on the outside of the VFO dial can be used for comfortable frequency fast-tuning in combination with the VFO dial. The MPVD dial may also be assigned to adjust other functions that may be important in the ever-changing HF communication operating, without taking your hand off the VFO.


Multi-Purpose VFO Outer Dial

CS (custom select) key

The CS (custom select) key can be assigned from the user menu to call an often needed function with a single touch. Functions assigned as CS can use the MPVD dial to make configuration changes and adjustments.



Custom Select key

SD Memory Card Slot

Use a commercially available SD Memory Card to save the communication record, transceiver settings, the memory contents, and screen capture images.
The SD Card is also used to update the firmware.



SD card slot

FUNC (Function) knob

Turn the FUNC knob to select an item in the setting menu, or change setting values, etc. The FUNC turn knob can be pressed to quickly select an item and then adjust the setting values or levels with the one knob. A function or setting menu that is used frequently may be assigned, so it can be accessed quickly and the setting made by simply turning the knob.



Function knob

QMB (Quick Memory Bank) Function

QMB function can be used to store a dedicated memory channel (QMB: Quick Memory Bank). With one touch the memory can easily be recalled. The Quick Memory Bank stores the frequency, the mode, and also the transmit/receive settings, filters and other parameters, so operating may begin quickly in the best condition without re-setting, when switching bands, Memory settings can be easily checked by listing the memory contents on the display. (Up to 10 memory channels are available)



QMB (Quick Memory Bank) key

Band Stack Function

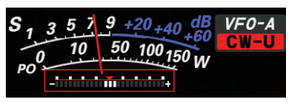
The FTDX10 employs a triple band-stack function that stores up to three favorite frequencies and modes for each band. The function is very effective when changing the frequency or mode, while operating on the same band during a DX-pedition or contest.

Various Functions Support Comfortable Operation

CW operation

CW zero-in Display

TX CW side tone frequency can be adjusted between 300Hz and 1050Hz. This pitch tone frequency is used as the reference in transmission, and so ensures that there is no difference between the TX and RX pitch. The FTDX10 has the CW tuning bar-display, to visually monitor and confirm the signal is zero beat (zero-in point) with the programmed pitch.



CW zero-in (Bar Display)

CW Auto zero-in

CW Auto Zero-in measures the frequency of the received CW signal and tunes the beat frequency Oscillator to match the programmed pitch frequency automatically (auto-zero-in). Even for the experienced operator, it is sometimes difficult to zero beat just by listening. This function enables zero-beat automatically with one-touch, and the operator can begin the QSO very quickly.



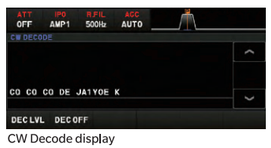
CW Auto zero-in key

CW Reverse

During CW operation, if there is interference in the received signal, CW reverse function provides a means of removing the interference by inverting the side band.

CW Decode

The FTDX10 CW Decode function can decode the Morse code and show the characters and text on the display.



CW Decode display

CW Keying Signal form Shaping by FPGA

The rise/fall time of the TX signal (transmit signal waveform) during CW keying can be adjusted in 4 steps. In each setting, signal shaping by FPGA digital processing can produce a transmit signal with an ideal shape.

Other CW Features

- Built-in Electronic Keyer (keyer mode selection: A / B / Y / ACS)
- Contest Memory Keyer • Bug keying emulation • Keyer Weight control
- Keyer paddle Dot-Dash reversal • Contest number auto count up
- Beacon function to transmit a stored CW message repeatedly at fixed intervals
- CW full break-in • CW semi break-in
- CW delay time selection (30 msec to 3000 msec)
- CW keying speed control (4 wpm to 60 wpm)
- CW direct keying function in SSB mode • CW SPOT

RTTY (FSK) / PSK Operation

The FTDX10 has a built-in encoder and decoder of FSK and PSK (BPSK / QPSK) digital messaging communication modes for operation with RTTY and PSK31.

RTTY Encode/Decode function

The RTTY decoding and encoding functions can be easily tuned to the received signal using the marker on the filter function that is displayed together with the decoding screen. Mark frequency, SHIFT width and the baudot code can be changed in the setting menu. Also, by connecting the FTDX10 to a PC with a commercially available USB cable (A-B), permits RTTY operation using commercially available data communication software.

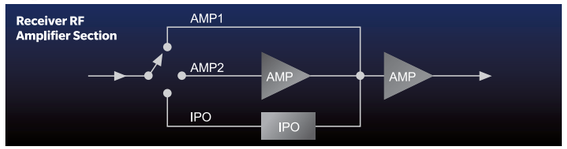
RTTY/PSK Text Memory

RTTY text memory and PSK text memory (each with a maximum of 50 characters × 5 channels) can store sentences that are frequently used in RTTY and PSK transmission. The pre-stored messages can be transmitted using the touch panel, or the optional FH-2 (remote control keypad) may be connected.

Other Practical Features

Optimal RF gain selection by IPO (Intercept Point Optimization)

Depending on the antenna and the received signal conditions, the gain of the Receiver RF amplifier section can be selected from three operating states to input a signal of the optimum level to the mixer. IPO is effective in severe reception conditions encountered on the low frequency bands. AMP1 (gain approx. 10 dB) provides a balance of sensitivity and characteristics by connecting one stage of RF amplification. AMP2 (gain approx. 20 dB) utilizes two stages of RF amplifier for greatest sensitivity.



AGC (Automatic Gain Control) Function

AGC automatically adjusts the overall gain of the receiver according to the strength of the received signal. This prevents the receiver from saturating and causing distortion. In AUTO mode, the time constant is automatically switched according to the operating mode. However, when there is noise or fading, the time constant of the AGC circuit can be manually switched according to the situation to receive in an optimal state. The AGC setting is recalled for each band stack.

Quick Function makes SPLIT operation effortless

The quick-split function enables using different frequencies set to the A band and B band, this supports smooth and comfortable operation during DX-peditions.

■ **Quick Split Function**

Set the receive frequency in the operating band then press and hold the “SPLIT” key. The transmit frequency is set 5 kHz (initial setting) higher than the receive frequency, and the split operation can be performed quickly. (Set or change the offset frequency in the setting menu.)

■ **Quick Split Input**

When quick split input is selected in the setting menu, you can hold down the "SPLIT" key and specify the offset frequency with the touch panel operation on the screen.

Reception

- 30 kHz to 75 MHz general coverage receive function
  (Performance is not guaranteed for frequencies other than in the amateur bands)
- FM/AM wide/narrow mode
- Data communication such as RTTY/PSK, External connection terminal
- ATT (Attenuator)
- NB (Noise Blanker)
- Scan function: VFO scan, memory scan, PMS (Programmable memory scan)

Transmission

- VOX (Automatic voice transmission)
- VOX gain adjustment / Anti VOX gain adjustment
- MOX (Transmission hold)
- TOT (Timeout timer)
- TX Monitor
- CTCSS encoding (50 codes in FM mode)
- Voice Memory (voice recording for transmission: up to 90 seconds × 5 channels)

Operability

- Adjustment of VFO dial torque
- Frequency shift by touch panel operation
- Numeric keypad frequency input
- Main dial lock
- Screen capture
- Band stack function
  (Stores the settings without switching the operating band (3 memories per band))
- Keyboard LANGUAGE (input language) selection

Display

- Receiver operation status display
- Scope display sweep speed variable
- Function menu display
- Various meter display selections
- Screen saver
- EXPAND display function to extend the scope display image vertically

Extensive External Input/Output Connections

Compatible Long wire Auto Antenna Tuner (FC-40)

A tuner terminal on the rear panel supports the FC-40 auto antenna tuner that can match a wire 20m or more in length to amateur bands 1.8MHz to 30MHz, 50MHz to 54MHz. Matched frequencies are stored in 200 matching memories making tune-up much quicker when returning to a previously used operating frequency.

External Display Terminal

An external display terminal (DVI-D) on the rear panel provides a digital video output for connection to a large screen monitor.



ACC Terminal

An optional LAN unit can be connected to the ACC (Accessory) terminal to perform remote operation via a LAN or the Internet.

Remote Keypad FH-2 provides Convenient Message memory Control

The optional remote-control keypad (FH-2) supports the message memory function that records and transmits short voice messages. It also supports the contest memory keyer used for CW operation to automatically transmit short contest messages etc...

Equipped with Three USB Ports

Two USB ports (A type) on the rear panel are available to use for operating the transceiver and inputting text with a connected mouse and keyboard. And a USB connection terminal (B type) supports CAT operation, audio input/output and TX control.

Remote Operation with Network Remote Control System

Supports Spectrum Scope and Various Functions
Enables Comfortable Operation even from a Remote Location

Network Remote Control System permits transceiver operation from a remote location via the LAN or the Internet. (Requires optional external LAN unit)
In remote operation the transceiver basic operations, the spectrum scope and the versatile displays enable sophisticated station control. Also, there are diverse enjoyable uses such as monitoring the band status on a large display at a location away from the "ham shack", by connecting to a home LAN network.

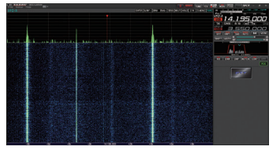


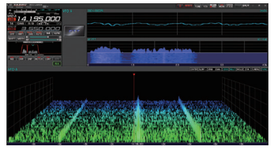


Operating Panel on PC screen

Valuable Features in Remote Operation

- Flexible Operating Panel Layout
- Basic Transmit/Receive operation
- RF Band scope function (3DSS, Waterfall Display)
- MULTI Screen Display (Band Scope/Oscilloscope/AF-FFT)
- Roofing Filters & Interference Reduction functions
- Memory Channel Function
- Others


Band Scope (Waterfall) Display


MULTI Screen (3DSS) Display

External Display Connection

An external digital video output terminal (DVI-D) is furnished on the rear panel. Directly connect to the external display using a commercially available DVI-D digital cable without need of the LAN connection or LAN unit. It enables video operation and communication such as projecting the detailed band conditions or filter settings by a High-resolution large screen monitor.



Front panel / Rear panel

Front panel



Rear panel



Front panel

1 PHONES
Headphone Jack: Mono (ø3.5mm)
*When headphones are connected, output from built-in speaker is muted

2 MIC
Microphone Connector (8-pin)

3 SD card slot
Use a commercially available SD card to record the communication, save transceiver settings and memory contents. The SD card is also used to update the firmware

Rear panel

4 RTTY/DATA
Terminal unit for RTTY, TNC connection terminal for packet communication

5 ANT
Antenna terminal (M type)

6 GND
Earth ground terminal

7 Cooling FAN

8 REM
Remote Control Keypad FH-2 connection terminal

9 LINEAR
Terminal for linear amplifier connection

10 EXT SPKR
External speaker terminal
Mono jack (ø3.5mm) to connect external speaker (4Ω to 16Ω)

11 DC IN
DC13.8V power supply connection terminal

12 KEY
CW Key Jack
CW key & Electronic keyer connection terminal (ø6.3mm)

13 EXT-DISPLAY
External display connection terminal (DVI-D)

14 USB Jacks
USB (A type) keyboard and mouse connection terminals

15 USB Jack
USB connection terminal (B type) for CAT/ Audio Input/output, TX Control

16 ACC
External device connection terminal

17 RS-232C
RS-232C straight cable connection terminal (Remote control from Personal Computer)

18 TUNER
External antenna tuner connection terminal

Accessories


XF-130CN
CW Narrow Filter
9.005MHz / CW 300Hz


SP-30
High-Quality External Speaker
- Speaker diameter: ø77mm
- Maximum input: 12W
- Impedance: 4Ω
- Dimensions (W×H×D): (approx.) 4.5"×3.6"×10.4" (115×91×263mm)
- Weight(approx.): 3.3 lbs (1.5kg)


M-1
Reference microphone
- Dual microphone configuration
- Long stroke Smooth Operating PTT key
- High visibility ON AIR LED
- Nine-band graphic equalizer for each microphone element
- Built-in record and playback feature


M-100
Dual element microphone
- Dual microphone configuration
- Long stroke Smooth Operating PTT key
- High visibility ON AIR LED
- Built-in one-click Low-Cut and High-Cut filters


M-70
Desktop microphone
- Long stroke Smooth Operating PTT key
- Built-in Low-Cut and High-Cut filters


SSM-75E
Hand microphone
(Supplied accessory)


YH-77STA
Lightweight Stereo Headphone

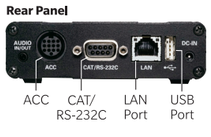

FH-2
Remote Control Key pad


MHG-1
Side Carry Handle


CT-39A
Packet Interface Cable


FC-40
Long wire compatible External auto antenna tuner

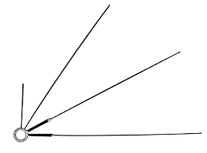

SCU-LAN10
Network Remote Control System LAN Unit



- Supply Voltage: Nominal DC13.8V
- Operating Voltage: DC9.0V to DC15.2V
- Current Consumption: max. 800mA
- Operating Temperature Range: +32°F to +122°F (0°C to +50°C)
- Dimensions: W4.37"×H1.24"×D5.31" (111×31.5×135mm)
- Weight: 0.93 lb (420g)


ATAS-25
Active Tuning Antenna (Manual Type)


ATAS-120A
Active Tuning Antenna (Automatic Type)


ATBK-100
Antenna Base Kit for ATAS-120A
For Base operation on 6m band

Specifications

General	
Tx Frequency Ranges	1.8MHz band - 50MHz band (Amateur bands only) 70MHz - 70.5MHz (UK Amateur bands only)
Rx Frequency Range	30kHz - 75MHz (operating) 1.8MHz - 29.699999MHz (Specified performance, Amateur bands only) 50MHz - 53.999999MHz (Specified performance, Amateur bands only) 70MHz - 70.499999MHz (Specified performance, UK Amateur bands only)
Emission Modes	A1A (CW), A3E (AM), J3E (LSB/USB), F3E (FM), F1B (RTTY), G1B (PSK)
Frequency Steps	1/5/10Hz (SSB, CW), 10/100Hz (AM, FM)
Antenna Impedance	50Ω, unbalanced (Antenna Tuner OFF) 16.7 - 150Ω, unbalanced (Tuner ON, 1.8MHz - 29.7MHz Amateur bands) 25 - 100Ω, unbalanced (Tuner ON, 50MHz Amateur band)
Operating Temperature Range	+32°F to +122°F (0°C to +50°C)
Frequency Stability	±0.5ppm (after 1 minute @+32°F to +122°F [0°C to +50°C])
Supply Voltage	DC13.8V ±15%
Power Consumption (Approx.)	Rx (no signal) 2.5A Rx (signal present) 3.0A Tx (100W) 23A
Dimensions (W×H×D)	10.5" × 3.6" × 10.4" (266 × 91 × 263mm)
Weight (Approx.)	13 lbs (5.9kg)

Transmitter	
Power Output	100W (CW, LSB, USB, FM, RTTY, PKT), 25W (AM)
Modulation Types	J3E (SSB): Balanced A3E (AM): Low-Level (Early Stage) F3E (FM): Variable Reactance
Maximum FM Deviation	±5.0kHz / ±2.5kHz (Narrow)
Harmonic Radiation	Better than –50dB (1.8MHz - 29.7MHz Amateur bands) Better than –63dB (50MHz Amateur band: 100W)
SSB Carrier Suppression	At least 60dB below peak output
Undesired Sideband Suppression	At least 60dB below peak output
Bandwidth	3kHz (LSB/USB), 500Hz (CW) 6kHz (AM), 16kHz (FM)
Audio Response (SSB)	Not more than –6dB from 300 to 2700Hz
Microphone Impedance	600Ω (200 to 10kΩ)

Receiver			
Circuit Type	Double Superheterodyne		
Intermediate Frequencies	1st IF 9.005MHz 2nd IF 24kHz		
Sensitivity (TYP)	SSB/CW (BW: 2.4kHz/10dB S+N/N) 1.8MHz - 30MHz 0.16μV (IPO: AMP2) 50MHz - 54MHz 0.125μV (IPO: AMP2) 70MHz - 70.5MHz 0.16μV (IPO: AMP2) AM (BW: 6kHz/10dB S+N/N, 30% modulation @400Hz) 0.5MHz - 1.8MHz 7.9μV 1.8MHz - 30MHz 2μV (IPO: AMP2) 50MHz - 54MHz 1μV (IPO: AMP2) 70MHz - 70.5MHz 2μV (IPO: AMP2) FM (BW: 12kHz, 12dB SINAD, 3.5kHz DEV @1kHz) 28MHz - 30MHz 0.25μV (IPO: AMP2) 50MHz - 54MHz 0.2μV (IPO: AMP2) 70MHz - 70.5MHz 0.25μV (IPO: AMP2)		
Selectivity (WIDTH: Center)	Mode	–6dB	–60dB
	CW (BW=0.5kHz)	0.5kHz or better	0.75kHz or less
	SSB (BW=2.4kHz)	2.4kHz or better	3.6kHz or less
	AM (BW=6kHz)	6kHz or better	15kHz or less
	FM (BW=12kHz)	12kHz or better	25kHz or less
IF Rejection	70dB or better (1.8MHz - 28MHz Amateur bands) 60dB or better (50MHz Amateur bands)		
Image Rejection	70dB or better (1.8MHz - 28MHz Amateur bands) 60dB or better (50MHz - 54MHz Amateur bands)		
Maximum Audio Output	2.5W into 4Ω with 10% THD		
Audio Output Impedance	4 to 16Ω (4Ω: nominal)		
Conducted Radiation	Less than 4nW		

* Specifications are subject to change, in the interest of technical improvement, without notice or obligation, and are guaranteed only within the amateur bands.

About this brochure: We have made this brochure as comprehensive and factual as possible. We reserve the right, however, to make changes at any time in equipment, optional accessories, specifications, model numbers, and availability. Precise frequency range may be different in some countries. Some accessories shown herein may not be available in some countries. Some information may have been updated since the time of printing; please check with your Authorized Yaesu Dealer for complete details.

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