

HF/50MHz SDR Transceiver

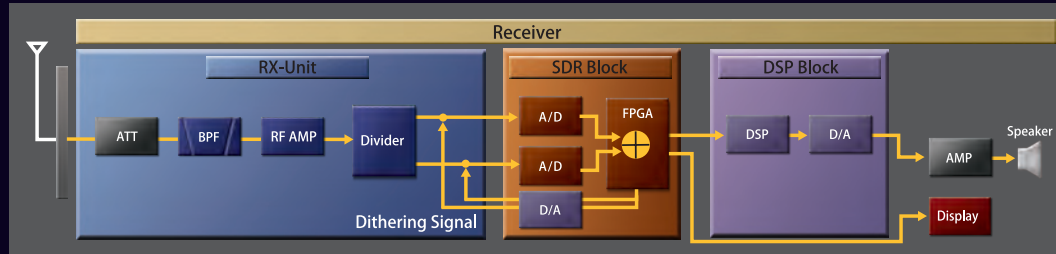
# FT-710 Series



● Display is not included. The image is shown with an optional third-party external display.

## SDR circuit configuration emphasizes Receiving Performance

The FT-710 is equipped with the same high-resolution A/D converter and FPGA used in Yaesu high-end SDR transceivers. The twin A/D converter circuit configuration performs digital conversion processing using two A/D converters. The digital signal is combined by the FPGA to reduce overload and overflow of the A/D converters and improve blocking characteristics. In addition, random noise is added to the analog signal before digital conversion, distortion is suppressed by minimizing the quantization error during digital conversion by the A/D converter, and a dithering technology that improves IM (Intermodulation) characteristics is adopted. The overall performance of the SDR receiving circuit is superb.



Receiver Block Diagram

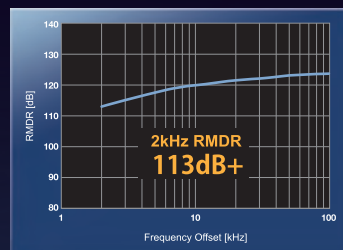


14bit High-resolution A/D converter

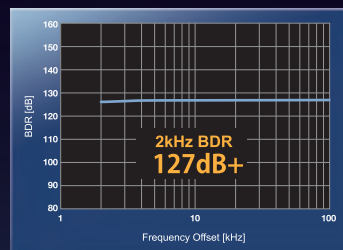
28nm Process FPGA

## Powerful RF Front-End and Low Noise Oscillator System enable Phenomenal Multi-signal Receiving Characteristics

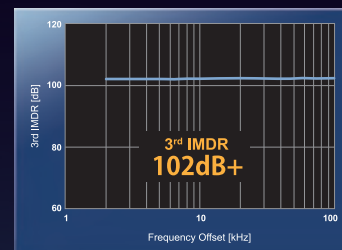
The BPF (Band Pass Filter) in the amateur bands or the RF amplifier, are excellent in intermodulation characteristics. A low NF (Noise figure) is adopted in the Powerful RF front-end section. Additionally, a high purity 250MHz oscillator circuit configuration is used, it is possible to supply a high-quality sampling clock signal with excellent C/N characteristics to the A/D converter. While the FT-710 is compact, it boasts proximity multi-signal characteristics comparable to the high-end transceivers. In the transmitter section, excellent C/N characteristics and low noise are thoroughly pursued by the high quality clock signal from 250MHz HRDDS (High Resolution Direct Digital Synthesizer). The transmission phase noise characteristics achieve  $-143\text{dBc/Hz}$  at 2 kHz separation.



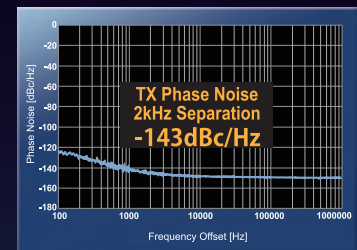
14MHz Band RMDR (Reciprocal Mixing Dynamic Range)



14MHz Band BDR (Blocking Dynamic Range)



14MHz Band IMDR (3rd Intermodulation Dynamic Range)



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

## Effective QRM Rejection is afforded by High-speed DSP

The Dual core 32-bit high speed floating decimal point DSP (Clock frequency: 594MHz / 198MHz) produced by NXP® Semiconductors, is used. Yaesu's effective Interference Reduction Systems: SHIFT / WIDTH / NOTCH / CONTOUR / APF (audio peak filter) / DNR (digital noise reduction / NB (noise blanker) are performed by high-speed digital processing. The interference functions are all accessed from the DSP dial. The filter display shows pass-band AF spectrum information as well as the operation status of the interference reduction functions.



Dual Core 32-bit High speed floating decimal point DSP



SP-40 External Speaker (FT-710 AESS supplied accessory)

## AESS produces High-fidelity Audio

AESS (Acoustic Enhancement Speaker System) is generated by digital processing. The Mid-Low frequency enhancement speaker and the side speaker are combined to create the dramatic overall audio frequency response and high-fidelity audio output.





*Carries the Yaesu genes for true RF performance*

## ***FT-710 Series***

*AESS: With Acoustic Enhanced Speaker System  
Expansive and clear reception audio that is unexpected  
from a compact transceiver*



《 Actual Size 》

## Front Panel Design Emphasizes Operating Efficiency and Comfort

Compact Transceiver, yet a large 4.3-inch TFT color touch panel display provides intuitive operation and outstanding visibility. Primary operating functions are arranged on the front and centered above the VFO dial for operating efficiency and instant access.



Image of SP-40 external speaker attached to the right side

## VMI (VFO mode indicator)

Large size VMI LED indicators are placed on the left and right of the VFO dial to show the current operating modes (VFO-A, VFO-B, Memory mode and clarifier/split operation) at a glance. VMI assists smooth operation and error-free tuning.



## FUNC (Function) Dial

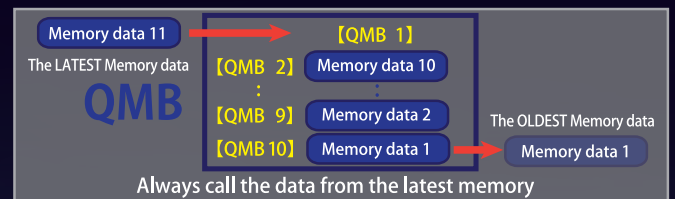
Turn the "FUNC" dial to select an item in the setting menu, or change setting values, etc. The FUNC turn knob can be pressed to quickly select an item and then adjust the setting values or levels with the one knob.

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.



## QMB (Quick Memory Bank) Function

The QMB function can be used to store dedicated memory channels (Quick Memory Bank). With one touch a 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)



## Various functions support comfortable operation

### "PRESET" Mode Functions most suitable for FT8 operation

The optimum setting values for the "FT8" Communication mode may be enabled with the select "PRESET" on the MODE screen to quickly begin "FT8" operation. The "PRESET" item settings can be called and customized by pressing and holding "PRESET". It is possible to save up to five preset parameters.



### Compatible Long wire Auto Antenna Tuner (FC-40)

A tuner connection 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.

### SD Memory Card Slot

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

### Equipped with Two USB Ports

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

### Other Practical Features

- Built-in High Speed Automatic Antenna Tuner (large capacity 100 channel memory)
- CW operation (CW zero-in Display, CW Auto zero-in, CW Reverse, CW Keying Signal form Shaping, Contest Memory Keyer, etc.)
- 3-Stage Parametric Equalizer
- IPO (Intercept Point Optimization)
- AGC (Automatic Gain Control)
- Band Stack Function
- Compatible ATAS: Active tuning antenna
- Supported CW operation by Remote control keypad FH-2
- CAT (3-system)

HF/50MHz 100W SDR TRANSCEIVER w/ SP-40  
**FT-710 Aess**  
 Acoustic Enhanced Speaker System

HF/50MHz 100W SDR TRANSCEIVER  
**FT-710 Field**



## Equipped with 3DSS (3-Dimensional Spectrum Stream) High Resolution 4.3-inch TFT Color Touch Panel Display

The large 4.3-inch wide full-color touch panel display, affords intuitive management of operating frequency, meters and main function settings. The real-time spectrum scope display adopts the FTDX series SDR 3D scope (3DSS) to visualize changes in signal strengths within the bands.

### [Scope Specifications]

Sweep speed : 30 FPS (Approximately)

Display Range : 100 dB

Span width : 1-1000 kHz



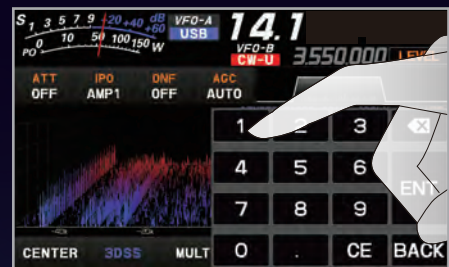
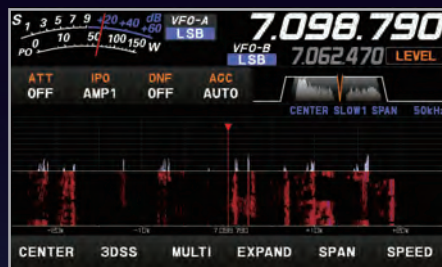
Selectable Spectrum scope display color from a wide variety of colors



## MULTI Function Display

The MULTI function 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 RX filter and interference reduction functions can be observed on the MULTI display for their influence on the received signal, even in the contest fray, etc.

## Excellent Visibility & Operability with versatile visual display



## 3DSS (3-Dimensional Spectrum Stream)

The real-time spectrum scope is provided by the 3DSS. The 3DSS presents the constantly changing band conditions in three dimensions (3-D). The signal strength flows in time to the rear of the screen, and an operator can intuitively view the constant changes in a signal's strength.

## Waterfall display

The 3DSS display and the waterfall display are selected alternately by touching "3DSS" on the screen. The waterfall display time (History of the received signal) may be extended by touching "EXPAND" on the screen.

## Frequency Direct Entry

In addition to frequency changes performed by the VFO dial, the FT-710 supports ten key frequency input using a keypad that is displayed by touching the TFT Panel frequency display section. The frequency can also be instantly changed on the scope screen by touching the peak of the desired signal.

## External Display Connection

An external digital video output terminal (DVI-D) is furnished on the rear panel. Directly connect to an 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.



DVI-D Terminal (Rear Panel)



## Remote Operation with Network Remote Control System (Available in near future)

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.



## REAR PANEL



- ① **TUNER / LINEAR**  
Optional Tuner and Linear Amplifier connection terminal
- ② **ANT**  
Antenna terminal (M type)
- ③ **Cooling FAN**
- ④ **DC IN**  
DC13.8V power supply connection terminal
- ⑤ **EXT-DISPLAY**  
External display connection terminal (DVH-D)
- ⑥ **USB Jack (Type-A)**
- ⑦ **USB Jack (Type-B)**
- ⑧ **RTTY/DATA**  
RTTY and DATA terminal
- ⑨ **KEY**  
CW Key Jack
- ⑩ **REM / ALC**  
Remote Control Keypad FH-2 connection terminal
- ⑪ **EXT SPKR**  
External speaker terminal Mono jack (ø3.5mm)
- ⑫ **GND**  
Earth ground terminal

## ACCESSORIES

<b>M-1</b> Reference microphone 	<b>M-100</b> Dual element microphone 	<b>M-90D</b> Desktop Dynamic microphone 	<b>M-90MS Kit</b> Dynamic microphone Stand Kit *Microphone stand is not included 	<b>M-70</b> Desktop microphone 
<b>YH-77STA</b> Lightweight Stereo Headphone 	<b>FH-2</b> Remote Control Key pad 	<b>CT-39A</b> Packet Interface Cable 	<b>FC-40</b> Long wire compatible External auto antenna tuner 	<b>SCU-LAN10</b> Network Remote Control System LAN Unit 
<b>ATAS-25</b> Active Tuning Antenna (Manual Type) 	<b>ATAS-120A</b> Active Tuning Antenna (Automatic Type) 	<b>ATBK-100</b> Antenna Base Kit for ATAS-120A (For Base operation on 6m) band 	<b>SMB-209</b> Mobile Bracket 	
<b>Supplied Accessories</b>	<b>SSM-75E</b> Hand microphone DC Power Cable 	<b>SP-40</b> High-Quality External Speaker (For FT-710 AESS only) 	<b>Carrying Belt</b> (For FT-710 Field only) 	<b>MHG-1</b> Side Carry Handle 

## 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)
Frequency Steps	1*/5/10/20Hz (CW/SSB/AM), 100Hz (FM) *FINE tuning "ON"
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) 1.8A Rx (signal present) 2.2A Tx (100W) 21A
Dimensions (W×H×D)	9.4" × 3.1" × 9.7" (239 × 80 × 247mm)
Weight (Approx.)	9.92 lbs (4.5kg)
Transmitter	
Power Output	5 - 100W (5 - 25W AM Carrier)
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)

Transmitter																
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	Direct sampling Superheterodyne															
Intermediate Frequencies	SSB/CW: 18kHz AM/FM: 24kHz															
Sensitivity (TYP)	SSB/CW (BW: 2.4kHz/10dB S+N/N) 1.8MHz - 30MHz 0.16 μV (IPO: AMP2) 50MHz - 54MHz 0.125 μV (IPO: AMP2) 70MHz - 70.5MHz 0.16 μV (IPO: AMP2) AM (BW: 6kHz/10dB S+N/N, 30% modulation @400Hz) 0.5MHz - 1.8MHz 6.3 μV 1.8MHz - 30MHz 2 μV (IPO: AMP2) 50MHz - 54MHz 1 μV以下 (IPO: AMP2) 70MHz - 70.5MHz 2 μV (IPO: AMP2) FM (BW: 12kHz, 12dB SINAD, 3.5kHz DEV @1kHz) 28MHz - 30MHz 0.25 μV (IPO: AMP2) 50MHz - 54MHz 0.2 μV (IPO: AMP2) 70MHz - 70.5MHz 0.25 μV (IPO: AMP2)															
Selectivity (WIDTH: Center)	<table border="1"> <thead> <tr> <th>Mode</th> <th>-6dB</th> <th>-60dB</th> </tr> </thead> <tbody> <tr> <td>CW (BW=0.5kHz)</td> <td>0.5kHz or better</td> <td>0.75kHz or less</td> </tr> <tr> <td>SSB (BW=2.4kHz)</td> <td>2.4kHz or better</td> <td>3.6kHz or less</td> </tr> <tr> <td>AM (BW=6kHz)</td> <td>6kHz or better</td> <td>15kHz or less</td> </tr> <tr> <td>FM (BW=12kHz)</td> <td>12kHz or better</td> <td>25kHz or less</td> </tr> </tbody> </table>	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
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FM (BW=12kHz)	12kHz or better	25kHz or less														
Image Rejection	70dB or better (1.8MHz - 28MHz Amateur bands) 60dB or better (50MHz 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															

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