

YAESU
The radio

FT-991A

HF/VHF/UHF
ALL MODE TRANSCEIVER

CW
1.820

SSB
14.195

C4FM
146.520

SSB
144.200

FM
446.000

CW
7.030

SSB
21.295



〈Actual size〉

Explore the Vast Ocean of Radio waves HF through UHF

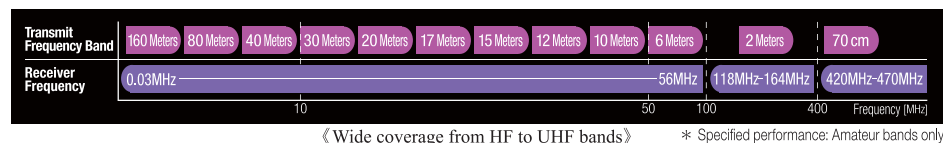
《Wide-Coverage Transceiver》

With Real-Time Spectrum Scope and Multi-Color Waterfall Display

An all-around model with a built-in real-time spectrum scope and superior basic performance

All modes from HF to UHF bands condensed into a small body

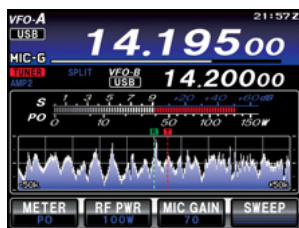
Covers the amateur radio bands from 160 m to 70 cm, and is capable of all modes SSB/CW/AM/FM, even the high-definition C4FM digital mode. All this condensed into a compact body W: 9"x H: 3.2"x D: 10" (229 x 80 x 253 mm). This is all the radio you will need to enjoy the wide world of amateur radio.



Supports Real-Time Spectrum Scope with Multi-Color Waterfall Display

Instantly evaluate band conditions with the built-in real-time spectrum scope

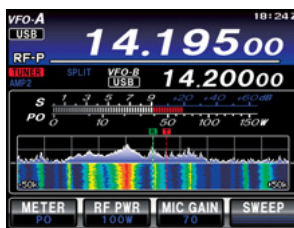
Listen to the received audio while tuning with the built-in high resolution real-time spectrum scope. Instantly evaluate ever-changing band conditions and easily find the desired signals. TX and RX markers are displayed on the scope for immediate grasp of the relationship between the TX and RX frequencies. The display color of the scope screen can be selected as desired.



Real-time spectrum scope display

Supports multi-color waterfall display

The waterfall display function presents the strength of the RX signals using color variations flowing with time. This allows for visual recognition of even the faint signals which rarely appear as peaks, offering a more detailed view of the band. The colors of the waterfall screen can be selected from seven color displays or multicolor.



Multi-color waterfall display

Latest Touch Panel Operation, Combined With Traditional Front Panel Layout, Achieve Optimal Ease of Use

3.5 inch full color touch panel display for convenient comfortable operating



- Full color TFT LCD display provides useful information about function status and settings at a glance
- Highly responsive panel with functional design and intuitive layout makes touch operation a pleasure
- Four user-customizable function keys offer quick access to mode-dependent assignments
- Traditional layout of Main Dial knob and related controls makes experienced users feel right at home

Uncompromising Circuit Design Ensures Excellent Receiver Performance from HF to VHF/UHF

Sophisticated receiver front end engineering is on a par with FTD Series Transceivers

RF amplifier design is optimized for each band

- Triple conversion with 1st IF frequency of 69.450 MHz for all bands * SSB/CW/AM

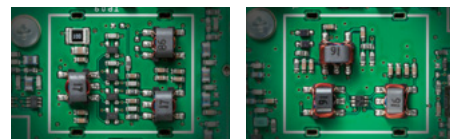
- 1st IF stage implements a narrow bandwidth 3 kHz roofing filter as standard equipment
Designed for outstanding adjacent multi signal characteristics, not only in HF but also in VHF and UHF bands.

- Features the highly acclaimed quad mixer of the FTD series transceivers, along with a dedicated VHF/UHF mixer

The 1st IF mixer for HF/50 MHz features a quad mixer with four 3SK294 dual-gate MOS-FET devices that assure extremely low noise, excellent intermodulation characteristics, and high dynamic range. A dedicated VHF/UHF mixer, separate from the HF bands, permits design optimization for targeted frequencies, and results in superior performance characteristics.



3 kHz and 15 kHz Roofing Filter



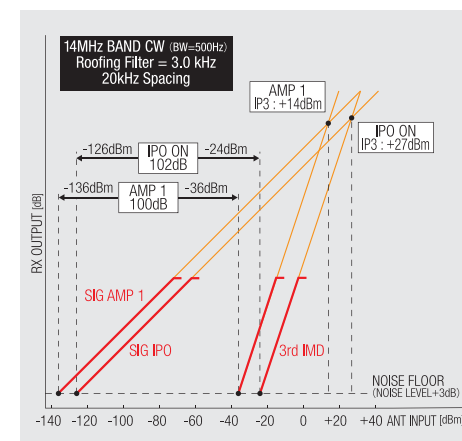
HF/50 MHz Quad Mixer

VHF/UHF Mixer

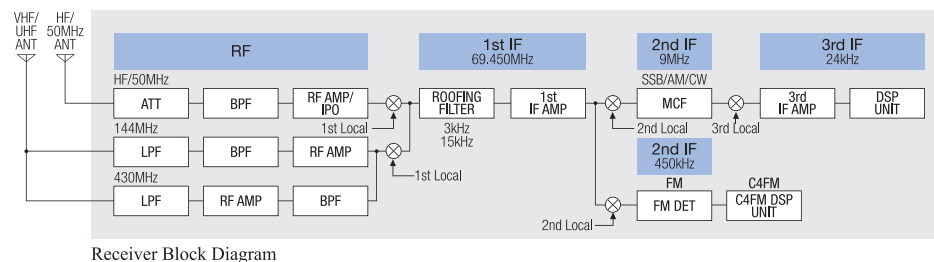
- Selectable IPO/AMP1/AMP2 (HF/50 MHz) settings for optimized operation with any received signal

- Separate RF amplifiers provide the best characteristics for each band

The IPO, AMP1 and AMP2 selections for the HF/50 MHz bands allow matching the settings to the current band and conditions, to ensure optimal RF amplifier operation. The RF amplifier for the 430 MHz band uses high-electron-mobility transistor (HEMT) NE3509 devices which maintain good performance into the GHz range, and combine high gain with a low NF (Noise Figure).



IDR (IMD Dynamic range) / IP3 (3rd-Order Intercept Point) characteristics



Receiver Block Diagram

The YAESU IF DSP is Famous for Superb Interference Rejection

Same high-speed floating point DSP as used in FTDX Series

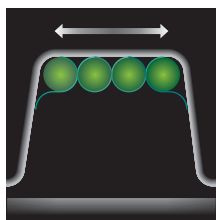
The high speed floating point DSP chip TMS320C6746 (3000 MIPS / 2250 MFLOPS) from Texas Instruments, makes possible excellent interference rejection with actual signals under real-world conditions, not only in the HF but also in the VHF and UHF bands.



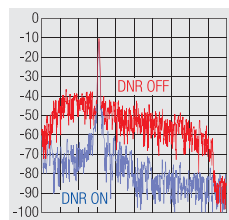
32-bit High Speed Floating Point DSP

Highly effective interference rejection

The IF WIDTH and IF SHIFT functions are the basis for removing interfering signals and are easily implemented for the best effect. The efficacy of interference rejection is further enhanced by sophisticated functions inherited from the FTDX series, such as the 16-stage digital noise reduction and the DNF (AUTO NOTCH) filter that rapidly tracks even multiple heterodynes. The CONTOUR function that enhances the desired signal with a natural sound, and the NOTCH function with selectable bandwidth, along with other functions are provided for comfortable and convenient DX and Contest QSO operation.



CONTOUR Filter Conceptual Diagram



Digital Noise Reduction Performance

Final Stage with Ample Power Reserves: 100 W for HF/50 MHz Band and 50 W for VHF/UHF Band

High quality push-pull amplifier with 100 watts for HF/50 MHz

Using a push-pull arrangement of RD100HHF1 MOS-FET devices, renowned for excellent performance in the HF/50 MHz range, the amplifier delivers 100 watts of low-distortion, high-quality power.

High speed 1.8 to 54 MHz antenna tuner included as standard equipment

The high speed digital tuner employs relay switching and features a large 100-channel tuning data memory. This allows the user to instantly call up optimum matching conditions for previously used frequencies.

50 W amplifier for VHF/UHF assures plenty of power for high frequency bands

The final amplifier for the VHF and UHF bands uses the high-output MOS-FET RD70HUF2 device which incorporates two MOS-FETs in a single package, providing ample output power of 50 watts.



V/UHF Final MOS FET RD70HUF2 Device

Support for Advanced C4FM Digital Functions

V/D mode for simultaneous transmission of voice and data with powerful error correction optimal for mobile use, and Voice FR (Full Rate) mode for high quality audio transmission

AMS function instantly recognizes digital mode or FM mode and enables mutual communication

GM (Group Monitor) function allows handy on-screen display of group members that are within communication range

126 types of DSQ (Digital Squelch) enable specific selection of communicating stations

Supports high-definition Amateur Radio WIRES-X internet connection, utilizing C4FM digital technology

* Does not support operation of WIRES-X digital node stations.
* Does not support sending and receiving of images via C4FM digital.

Basic function

Versatile Array of Functions for CW Operation

Advanced electronic keying (4 to 60 wpm) with FULL BK-IN support

Electronic Keyer Weight control (2.5 - 4.5)

CW side tone pitch frequency adjustable (300 - 1050 Hz)

Message Memory function (5 ch x 50 characters)

APF function with 3-stage bandwidth selection improves S/N ratio for enhanced intelligibility

Auto Zero-in function facilitates subtle tuning operations for CW

Automatic "Beacon" keyer mode

CW SPOT Feature

CW Mode reversal (USB or LSB injection)

Convenient Functions for FM Mode

104 types of DCS (Digital Code Squelch)

ARS function provides easy repeater access

50-tone CTCSS Encoder/Decoder for FM operation



HF/VHF/UHF 100 W All Mode Transceiver (144 MHz/ 430 MHz 50 W)

FT-991A

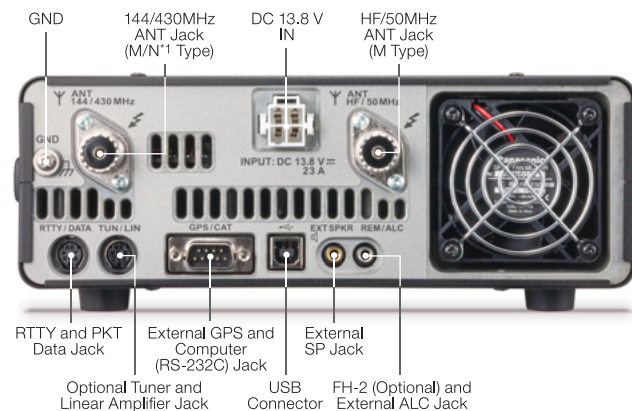
Useful and Convenient Functions

- Speech Processor ■ Parametric MIC EQ ■ Five-channel digital voice message memory function for repetitive voice messages ■ MULTI dial design facilitates setting operations ■ White LED Key button Illumination
- Independent AF GAIN, RF GAIN and CLAR/VFO-B knobs ■ FH-2 Remote Control (Optional) ■ VOX ■ MOX ■ 99 channel memory (supports memory group view, 12 alphanumeric characters) ■ RTTY/DATA Jack
- TUN/LIN connector allows connection of optional VL-1000 or FC-40 ■ Wide Band Receive Capability (30kHz-56MHz, 118-164MHz, 420-470MHz) ■ CS key brings up a preselected menu with a single touch
- USB port allows connection to a PC with a single cable (CAT control, Audio In/Out interface, PTT/RTTY(FSK) SHIFT control) ■ High Stability 0.5 ppm TCXO ■ Carrying Handle ■ Tilt Stand

Specifications

General		
RX Frequency Range	0.03 - 56 MHz, 118 - 164 MHz, 420 - 470 MHz (operating), 1.8 - 54 MHz, 144 - 148MHz, 430 - 450 MHz (specified performance, Amateur bands only)	
TX Frequency Ranges	1.8 - 54 MHz, 144 - 148MHz, 430 - 450 MHz (Amateur bands only)	
Frequency Stability	±0.5 ppm (after 1 minute @14°F - +122°F/-10°C - +50°C)	
Operating Temperature Range	+14°F - +122°F (-10°C - +50°C)	
Emission Modes	A1A (CW), A3E (AM), J3E (LSB, USB), F2D, F3E (FM), F7W (C4FM)	
Frequency Steps	5 / 10 Hz (SSB, CW, AM), 100 Hz (FM, C4FM)	
Antenna Impedance	50 Ohms, unbalanced 16.7 - 150 Ohms, unbalanced (Tuner ON, 1.8 - 30 MHz Amateur bands) 25 - 100 Ohms, unbalanced (Tuner ON, 50 MHz Amateur band)	
Power Consumption (Approx.)	RX (no signal)	1.8 A
	RX (signal present)	2.2 A
	TX	23 A (HF/50MHz 100 W), 15 A (144/430MHz 50 W)
Supply Voltage	DC 13.8 V ±15 % (Negative Ground)	
Dimensions (W x H x D)	9.0" x 3.2" x 10" (229 x 80 x 253 mm)	
Weight (Approx.)	9.5 lbs (4.3 kg)	
Transmitter		
Power Output	HF/50MHz: 5 - 100 watts (2 - 25 watts AM carrier) 144/430MHz: 5 - 50 watts (2 - 12.5 watts AM carrier)	
Modulation Types	J3E (SSB): Balanced / A3E (AM): Low-Level (Early Stage) F3E (FM): Variable Reactance / F7W (C4FM): 4-level FSK	
Maximum FM Deviation	±5.0 kHz / ±2.5 kHz	
Harmonic Radiation	Better than -50 dB (1.8 - 30 MHz Amateur bands) Better than -63 dB (1.8 - 30 MHz Amateur bands, above 30MHz)*1 Better than -63 dB (50 MHz Amateur band) Better than -60 dB (144 MHz, 430 MHz Amateur bands)	
SSB Carrier Suppression	At least 50 dB below peak output	
Undesired Sideband Suppression	At least 50 dB below peak output	
Bandwidth	3 kHz (LSB/USB), 500 Hz (CW), 6 kHz (AM), 16 kHz (FM/C4FM)	
Audio Response (SSB)	Not more than -6 dB from 300 to 2700 Hz	
Microphone Impedance	600 Ohms (200 to 10 kOhms)	

Rear Panel



Receiver			
Circuit Type	SSB/CW/AM: Triple-conversion Super heterodyne FM/C4FM: Double-conversion Super heterodyne		
Intermediate Frequencies	SSB/CW/AM: 69.450 MHz / 9.000 MHz / 24 kHz FM/C4FM: 69.450 MHz / 450 kHz		
Sensitivity	SSB/CW (BW: 2.4 kHz, 10 dB S+N/N) 0.158 μ V (1.8 - 30 MHz) (AMP 2), 0.125 μ V (50 - 54 MHz) (AMP 2) 0.11 μ V (144 - 148 MHz), 0.11 μ V (430 - 450 MHz) AM (BW: 6 kHz, 10 dB S+N/N, 30 % modulation @400 Hz) 5 μ V (0.5 - 1.8 MHz) (AMP2), 1.6 μ V (1.8 - 30 MHz) (AMP 2) 1.25 μ V (50 - 54 MHz) (AMP 2) FM (BW: 15 kHz, 12 dB SINAD) 0.35 μ V (28 - 30 MHz) (AMP 2), 0.35 μ V (50 - 54 MHz) (AMP 2) 0.18 μ V (144 - 148 MHz), 0.18 μ V (430 - 440 MHz) There is no specification for frequency ranges not listed.		
Squelch Sensitivity (TYP.)	SSB/CW/AM 1.0 μ V (1.8 - 30 MHz, 50 - 54 MHz, AMP 2) 1.0 μ V (144 - 148 MHz, 430 - 450 MHz) FM 0.35 μ V (28 - 30 MHz, 50 - 54 MHz, AMP 2) 0.125 μ V (144 - 148 MHz, 430 - 450 MHz) There is no specification for frequency ranges not listed.		
Selectivity	Mode	-6 dB	-60 dB
	CW	0.5 kHz or better	0.75 kHz or less
	SSB	2.4 kHz or better	3.6 kHz or less
	AM	6 kHz or better	15 kHz or less
	FM	12 kHz or better	30 kHz or less (-50dB)
Image Rejection	70 dB or better (160 - 6m Amateur bands) 60 dB or better (2m, 70cm Amateur band)		
Maximum Audio Output	2.5 W into 4 Ohms with 10% THD		
Audio Output Impedance	4 to 8 Ohms (4 Ohms: nominal)		
Conducted Radiation	Less than 4 nW		

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

Supplied Accessories: MH-31A8J Hand Microphone, T9025225 DC Cable

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.

*1 European version only *2 USA and Asian version only *3 VL-1000 and FH-2 cannot be used simultaneously *4 VL-1000, FC-40, and ATAS-120A cannot be used simultaneously

YAESU
The radio



Option

QUADRA SYSTEM				
VL-1000 HF - 50 MHz 1 kW Linear Amplifier *2 *3 *4 (50 MHz: 500 W/USA Version) Automatic Antenna Tuner Built In				
VP-1000 VL-1000 Power Supply *2 *3 *4				
 MH-31A8J Hand Microphone	 MH-36E8J DTMF Hand Microphone	 M-1 Reference Microphone	 MD-200A8X Ultra High fidelity Desktop Microphone	 MD-100A8X Desktop Microphone
 YH-77STA Stereo Headphones Microphone	 FH-2 Remote Control Keypad *3	 FC-40 Automatic Antenna Tuner *4 (for Long wire antenna)	 CT-58 Band Data Cable for VL-1000 *2 *3 *4	 CT-39A Packet Interface Cable
 FP-1023A (USA Only) External Power Supply (13.8 VDC 23 A)	 FP-1030A *2 External Power Supply (13.8 VDC 25 A)	 MMB-90 Mobile Bracket	 ATBK-100 Antenna Base Kit *4 (for BASE operation on 6 m, 2 m and 70 cm Bands)	 ATAS-120A Active Tuning Antenna *4 (Automatic Type)
			 ATAS-25 Active Tuning Antenna (Manual Type)	

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