

FT-847

HF+V·UHF ALL MODE TRANSCEIVER

YAESU

...leading the way.SM



The FT-847 Earth Station: The All-in-One Solution to Your Operating needs!

Yaesu was the first manufacturer to produce a self-contained amateur HF transceiver; the first to produce an FM transceiver with memory; the first to produce a full-duplex satellite transceiver; and now Yaesu is the first to produce an HF/VHF/UHF all-mode transceiver, ideal for home or field use, with the versatility to cover every modern operating mode!

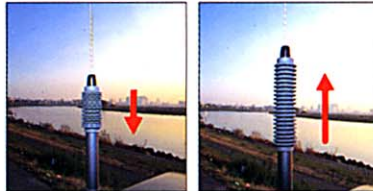
Control Antenna System SWR with the FC-20 HF/50 MHz External Automatic Tuner Option.

Ideal for tuning out minor SWR variations in your antenna system, the FC-20 will analyse the impedance present at the "radio" end of your coax, and adjust the impedance to match the 50Ω requirement for your FT-847. utilising fixed inductances and variable capacitors controlled by precision stepper motors, the FC-20 can accommodate SWRs of up to 3:1 on HF and up to 2:1 on 50 MHz. The FC-20 also provides 100 memories for tuning data, so you'll be instantly ready to transmit on your favorite frequencies, and it includes a convenient Auto-Start feature in case the antenna system impedance suddenly changes.



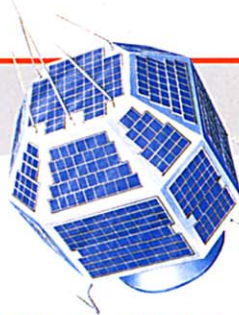
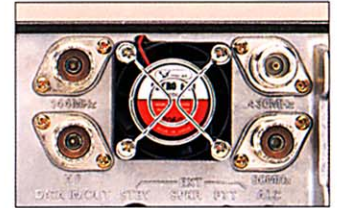
Yaesu's Patented ATAS-100 (ACTIVE-TUNING ANTENNA SYSTEM) Provides HF/VHF/UHF Coverage with Automatic Motorized Tuning!

The FT-847 Earth Station System can be expanded for mobile use on the 7/14/21/28/50/144/430 MHz bands via the revolutionary ATAS-100 ACTIVE-TUNING ANTENNA SYSTEM option. On HF and 50 MHz, the ATAS-100 is controlled via DC voltage transmitted on the coaxial cable, with an internal motor adjusting the antenna for best SWR by changing the length of its unique "accordion" tuning section; no "resonators" or optional "whips" need be changed! A single touch on the FT-847's TUNER key begins the tuning process, which is completed in seconds. The ATAS-100 is compatible with many common mobile mounts, which are available from your Yaesu dealer. Coaxial cable is not included.



Separate Antenna Connectors for HF, 50 MHz, 144 MHz, and 430 MHz!

Allowing ease of connection for your antenna systems, the separate antenna connectors for HF, 50 MHz, 144 MHz, and 430 MHz also facilitate full-duplex operation by avoiding internal "Duplexers" which can compromise noise figure. If you are using an HF through 50 MHz mobile antenna, the Menu System allows you to switch the 50 MHz RF line to the "HF" antenna jack, too!



Yaesu's Unmatched Expertise in the Design of Satellite Equipment Brings You the Excitement of Amateur Satellite DX and Data Operation!

Yaesu's FT-726R was the amateur industry's first satellite-ready full-duplex transceiver, introduced around the time of the launch of AMSAT-OSCAR 10 (AO-10). When AO-13 was launched a few years later, Yaesu's FT-736R was also launched, instantly becoming the most popular VHF/UHF multimode transceiver in history. Now, with the impending launch of the Phase 3D amateur satellite, the FT-847 continues Yaesu's position at the forefront of the satellite market!

Crossband Full Duplex Operation!

The four antenna jacks on the rear panel of the FT-847, in conjunction with Yaesu's time-proven crossband full duplex design know-how, bring you effortless satellite operation whereby you can monitor your downlink signal from the satellite while you are transmitting. The FT-847 is ready for operation on Mode A (TX: 145 MHz, RX: 29 MHz), Mode B (TX: 435 MHz, RX: 145 MHz), Mode J (TX: 145 MHz, RX: 435 MHz) and Mode T (TX: 21 MHz, RX: 145 MHz). Independent and display of both uplink and downlink frequencies is provided.



Uplink/Downlink Normal and Inverted VFO Tracking!

First introduced on Yaesu's FT-736R, the FT-847's VFO Tracking feature slaves the two VFOs according to the requirements of the satellite's transponder, so you can tune across the downlink sub-band without having to make manual uplink adjustments. Some satellites, like RS-12, use a transponder in which the uplink and downlink frequencies track in the same direction. Other satellites, like AO-10, FO-20, and FO-29 use "inverted" tracking, whereby moving your uplink signal higher in frequency lowers your downlink frequency. The FT-847 is ready for either situation, and you may also make minor Doppler-shift frequency corrections either to the transmit (uplink) or receive (downlink) frequency manually.

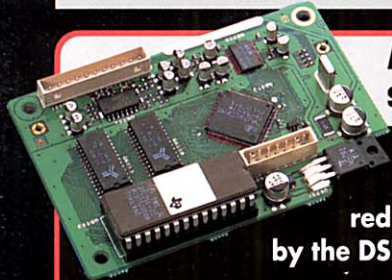
UPLINK LSB (MHz)	REV MODE	NOR MODE
	DOWNLINK USB (MHz)	DOWNLINK USB (MHz)
145.900	435.900	435.100
145.910	435.890	435.110
145.920	435.880	435.120
145.930	435.870	435.130
145.940	435.860	435.140

Convenience Features for Enjoyable, Efficient Satellite Operation!

- You can label each of the 19 special Satellite Memories with alpha-numeric "tags" to help you remember the satellite name and mode.
- During transmission, you can command the "satellite meter" function to indicate either power output (PO), discriminator center status (DISC), or ALC voltage (ALC).
- For data operation on satellites, the rear-panel DATA IN/OUT and PKT jacks can accommodate 9600 bps GMSK, 1200 bps PSK, or 1200 bps AX.25 AFSK modes.

Only one transceiver gives you all mode operation on the H.F., 50 MHz, 144MHz and 430 MHz bands with full satellite capability. the FT-847 Earth Station.

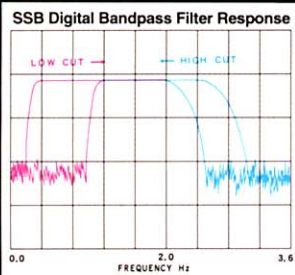
Ready for action on SSB, CW, HSCW, AM, FM, Packet, SSTV, and RTTY, the FT-847 expands your operating horizon beyond HF to the 6-Meter, 2-Meter, and 70-Centimeter bands, featuring DSP and full-duplex satellite operation, all within a super-compact package (260 x 86 x 270 mm WHD)!



Advanced Digital Signal Processing (DSP) system enhances signal-to-noise ratio via sophisticated Bandpass, Noise Reduction, and Automatic Notch Filters!

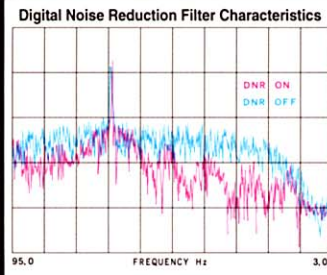
■ **Exceptional interference reduction is provided by the DSP Bandpass Filter.**

Yaesu's renowned DSP circuitry is led by the ultra-sharp Bandpass Filter feature, which utilizes the combined effects of independently-adjustable audio HPF (High-Pass Filter) and LPF (Low-Pass Filter) elements to provide very steep skirt selectivity and reduction of noise. In voice modes, the LPF may be adjusted to begin cutting off frequencies between 1500-3000 Hz, while the HPF cutoff frequency may be adjusted over the range 100 ~ 1600 Hz. On CW, the DSP BPF takes the form of an Audio Peaking Filter, with minimum bandwidths of 400 Hz, 200 Hz, 100 Hz, and even 25 Hz available for EME (Moonbounce) or other very-weak-signal work.



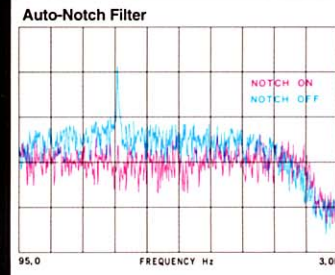
■ **Improve Signal-to-Noise Ratio with the DSP Noise Reduction Circuit.**

Building on the success of the FT-1000MP and FT-920 DSP Noise Reduction systems, Yaesu's engineers expanded their ambitious project to optimize two parameters in DSP noise reduction technology--response time and feedback coefficient--to provide the best DSP-based noise reduction system in the industry. After thousands of hours of on-the-air measurements and circuit evaluations, the Yaesu design team selected a total of 16 noise reduction parameters, so as to provide the best degree of noise suppression consistent with low distortion of the desired signal. This adaptive filter actually "form fits" itself around the incoming signal, while rejecting random noise, providing you with the best chance ever of pulling out those weak ones!



■ **Fast-acting DSP Auto-Notch Filter!**

To eliminate one or more interfering beat tones from the receiver audio passband, the DSP Auto-Notch Filter provides instantaneous sensing and notching of these tones. The notch width is very narrow, yielding minimal distortion of desired voice waveforms.



The FT-847 Earth Station: A masterpiece of high-tech design and packaging know-how!

Utilising the latest computer-aided design techniques and thousands of "chip" components, Yaesu's engineers have achieved an engineering breakthrough that was only a dream just a few years ago: a full-power transceiver covering the HF, 50 MHz, 144 MHz, and 430 MHz bands in a package about 2/3 the size of an average briefcase. Ready for action on SSB, CW, AM, FM, and Digital modes, the FT-847's ultra-compact size makes it ideal for serious base station use, as well as a variety of portable and mobile applications, including Field Day, DX-peditions, VHF/UHF "Rove" operations, and RV installations. And long-term reliability is ensured by the rugged construction, featuring an aluminum diecast chassis which doubles as the power amplifiers' heat sink.

All-New Leading-Edge Receiver Design!

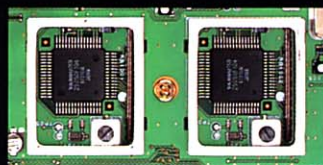
Catching DX on all the amateur bands between 1.8 and 450 MHz requires a receiver with several basic characteristics: (A) excellent sensitivity, to pull out weak signals; (B) minimal noise contributed by the receiver; and (C) the ability of the receiver to survive in the presence of extremely strong signals. The FT-847 was specifically designed to excel in all these areas.

On all bands, the fundamental architecture of the receiver is the same. After input bandpass filtering, a defeatable RF preamplifier provides front-end gain with very low noise figure and excellent dynamic range. The RF preamplifier is followed by a one-chip quad-FET first mixer, which provides outstanding rejection of intermodulation. The first receiver IF is at 45.705 MHz, while the second IF is at 455 kHz, where the main IF selectivity elements are found.

The receiver front end is the result of hundreds of hours of testing, evaluation, and re-design so as to provide wide dynamic range in the presence of a large number of strong signals, not just two tones in a testing lab. Devices to be used in the front end are individually selected and matched after extensive testing, so as to ensure consistent performance in the field. Yaesu, the pioneer in the development of the HF transceiver, continues that tradition with the leading-edge receiver performance of the FT-847!

Direct Digital Synthesizer Provides Ultra-Low Noise!

Replacing noisy PLL circuits of earlier years, the FT-847 utilizes a new-generation ultra-low-noise DDS (Direct Digital Synthesizer) in its local oscillator design. The DDS provides very fine tuning steps (down to 0.1 Hz per step!) for careful tuning of EME signals, seamless Doppler Shift correction during satellite work, and effortless Digital mode tuning. Additionally, the ultra-low-noise design of the DDS does not compromise the wide dynamic range of the receiver, by ensuring that the local signals are pure, with noise sidebands well suppressed. The outstanding Carrier-to-Noise Ratio of the DDS translates into better Signal-to-Noise Ratio for your FT-847's receiver!



Low-Noise Receive Preamplifiers including HEMT Device for 430 MHz!

Ensuring best noise figure for UHF operation, Yaesu's engineers have incorporated a very-low-noise 10 dB HEMT (High Electron Mobility Transistor) preamplifier for best sensitivity. Especially valuable for 430 MHz DX work, the HEMT preamp contributes to the FT-847's industry-best sensitivity specification of 0.125 μ V for 10 dB S/N (SSB bandwidth). If you have tower-mounted preamplifiers you wish to utilize instead, the FT-847 can be configured (independently on 144 and/or 430 MHz) to bypass the internal preamp in favor of passing +13.8V DC through your coax line to power your preamplifier.

EXCLUSIVE PUSH-PULL COOLING SYSTEM™!

The FT-847's twin cooling fans conduct heat away from the critical circuitry of the transceiver. The front-panel fan provides efficient ingress of cool air, which is ducted across the control and amplifier circuits. The rear fan, in turn, forces warm air out the back panel vents. This extensive thermodynamic design effort has produced a transceiver which is ready for the challenges of digital-mode or contest operation.

Exciting Receiver Features Enhance Your Operating Experience!

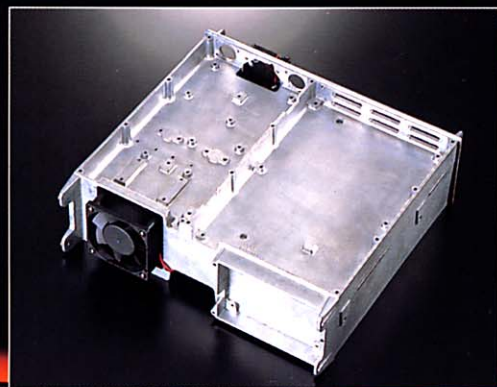
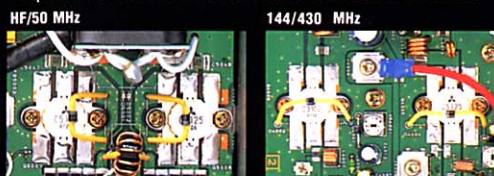
● EXPANDED RECEIVE FREQUENCY RANGE: 37~76, 108~174, and 420~512 MHz.

So you can check propagation below 6 meters, monitor the 4-meter band, download images from weather satellites, or follow the action on the public safety frequencies!

- IF SHIFT: For adjustment of IF passband to avoid interference.
- IF NOISE BLANKER: For reduction of automotive ignition noise.
- INPUT RF ATTENUATOR: For more comfortable reception of extremely strong signals.
- FIXED-LEVEL AF OUT JACK: For connection to tape recorder, WeatherFax decoder, etc.

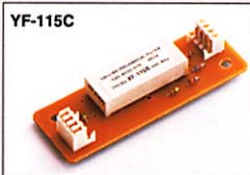
Innovative Transmitter Design Concepts!

The FT-847's unique power amplification design represents a major breakthrough in the amateur radio industry. For 1.8 ~ 54 MHz, the FT-847 uses a pair of rugged 2SC5125 bipolar power transistors in a push-pull configuration. On 144 MHz a single 2SC5125 is utilized, and on the 430 MHz band, a 2SC3102 UHF power transistor is used. Carefully specified and selected devices are employed in the power amplifier stages of this ultra-compact transceiver, producing consistent, reliable power output with low SSB intermodulation characteristics.



Optional Collins® Mechanical Filters for SSB and CW!

Renowned for their excellent frequency response, thermal stability, and low phase distortion, Collins® Mechanical Filters in 2.5 kHz and 500 Hz (-6 dB) bandwidths are available as options for the FT-847. The CollinsR SSB filter provides a very "flat" passband response which faithfully reproduces both voice and data signals (such as satellite PSK). The 500 Hz CollinsR 500 Hz filter is ideal for CW or RTTY work, with Wide/Narrow selection available from the front panel. Combined with the DSP audio filters, the Collins® Mechanical Filter options make the FT-847 an outstanding performer on SSB, CW, or Data!



Flexible Operating Provisions for the CW Operator!

CW flexibility is as essential on VHF and UHF as it is on HF, and the FT-847 provides a wealth of tools for outstanding CW performance. For EME and other very-weak-signal work, the DSP bandwidth may be made as narrow as 25 Hz, with minimum bandwidths of 100 Hz, 200 Hz, or 400 Hz also available. An iambic electronic keyer, with adjustable weighting, is provided along with semi-break-in T/R control. Either USB- or LSB-side injection may be used for CW reception, thanks to the CW REVERSE feature. And the ultra-fine tuning steps (as small as 1/10th of a Hz!) provide a tuning "feel" as smooth as that of an analog VFO!

SSB Excellence for Today's Active Amateur!

Your FT-847's "talk power" is enhanced by the built-in RF clipping-type Speech Processor, which increases average SSB output by approximately 6 dB. And the transmitted IF passband frequency may be adjusted, via Menu, to match or enhance the frequency characteristics of your voice pattern. Independent USB and LSB alignment Menus are provided; use the SSB MONITOR feature to make precise adjustments.

Data Capability for Every Operating Need!

The rear panel of the FT-847 includes convenient interface jacks for Data mode operating. For AFSK RTTY, 300 bps Packet, AMTOR, PSK, HSCW, etc., the three-pin DATA IN/OUT jack also supports "PTT" control in addition to AFSK input and output. For 1200/9600 bps VHF/UHF Packet, the PKT jack provides optimized input and output data lines, plus PTT and squelch status lines. The DATA IN/OUT jack's "RX" connection may also be used for interfacing to weather satellite, WeatherFax, or other computer-based specialized decoding software, as well as for tape recording of incoming receiver audio.

Microprocessor Control Provides Operating Enjoyment!

Quick Navigation via SHUTTLE-JOG™ Tuning Ring

First introduced on Yaesu's FT-1000MP and FT-920, the Shuttle-Jog™ Tuning Ring provides rapid frequency change by its unique spring-loaded design. Rotating the Shuttle-Jog™ ring

slightly to the left or right begins manual scanning to lower or high frequencies, respectively. Lean the ring further, and the scanning rate increases. There's no better way to get a "feel" for a band than by using Yaesu's exclusive Shuttle-Jog™!



Separate Sub-VFO Tuning Knob

The Sub-VFO Tuning Knob may be used in a number of ways. For transceive operation using the Main VFO, this knob may function as a CLARIFIER control ("R.I.T.") for minor frequency offsets. During HF "Split" DX pile-up operation, it may be used to adjust your transmit VFO's frequency. And during Satellite operation, it lets you correct your uplink frequency for Doppler Shift.



Channelised VFO/MEM CH Control Gets You Where You Want to Operate!

For those situations where quick (but precise) tuning of the band is required, the VFO/MEM CH switch provides "channelized" tuning via a rotary switch encoder knob. The step sizes may be changed, via the Menu, independently for the SSB/CW, AM, and FM modes and independently (on these modes) for the HF, 50 MHz, 144 MHz, and 430 MHz bands. During Memory Channel operation, this knob provides selection of your previously-stored memories.



"SPLIT" Operation for DX-pedition and Pile-up Operating!

Besides the Satellite and FM Repeater modes, the FT-847 includes a "SPLIT" operating mode for DX operation on the 7 MHz SSB band, or for DX pile-ups where the difference between the TX and RX frequencies is beyond the Clarifier's ± 9.99 kHz range. The Sub VFO serves as the VFO for transmission, and its frequency may be adjusted via the SUB-TUNE VFO knob.

High-Contrast Multi-Function Blue Liquid Crystal Display (LCD)

The large (200 mm x 20 mm) blue LCD provides high resolution and contrast for easy viewing over a wide range of angles and light levels. Dozens of status indicators keep you informed of every aspect of your FT-847's operational characteristics, with the large Sub-VFO field on the right side being particularly helpful during satellite operation. The LCD's illumination brightness is adjustable via an 8-level dimmer function.



10-Key Direct Frequency Entry Keypad!

For quick QSX particular frequency, the keypad may be used for direct frequency entry on both the Main and Sub VFOs. The keypad also provides control functions for repeater, scanning, and band/frequency hopping.



High-Speed Direct Computer Control Interfacing

Yaesu's CAT System for Computer Aided Transceiver control is provided via a rear-panel "DB-9" connector, and it includes a built-in RS-232C level converter. Just hook up your serial data cable, and you're ready for action! Data may be transferred at speeds of 4800, 9600, or even 57600 bps!

Optional Voice Frequency Announcement Module (FVS-1A)

For operators with impaired vision, the FT-847 includes provision for the optional FVS-1A Voice Synthesiser, which gives you an audible announcement of the current operating frequency (with resolution to the nearest 100 Hz step).

Popular Memory and Scanning Features

More than two decades after Yaesu's FT-227R was introduced as the world's first synthesised transceiver with memory, the FT-847 fortifies Yaesu's position as the leader in imaginative, easy-to-use memory and scanning circuitry design.

The FT-847 includes 78 regular memories, plus upper/lower band scanning limit memories, a CALL channel, and a HOME channel on each band. A two-channel Quick Memory Bank (QMB) allows instant recall of urgent frequencies, and nineteen special "Satellite Memory" locations with 8-character alpha-numeric labels allow you to note the satellite name and transponder mode (e.g. "AO-10/B").

Among the versatile scanning capabilities of the FT-847 are:

- Scan activation either from the microphone or the front panel of the transceiver. After stopping on a busy channel, the restart time may be programmed (via the Menu) at 3, 5, or 10 seconds.
- SMART SEARCH™ sweeping of the Main VFO (FM mode), with automatic loading of a special bank of 20 memory channels.
- Programmable Memory Scan, using sub-band limits you program yourself. For example, you might want to program 144.5 - 148 MHz on 2 meters so as to avoid encroachment on the SSB/CW sub-band at 144.0 - 146 MHz.
- Memory Channel #1 serves as the PRIORITY Channel, which can be checked for activity every five seconds.

Repeater and Tone Signaling Features for Today's FM Operator!

The FT-847 is an outstanding performer for many aspects of FM operation.

- Independently-programmable Repeater Shifts for 28, 50, 144, and 430 MHz.
- Automatic Repeater Shift (ARS) for 144 MHz and 430 MHz.
- FM Wide/Narrow modes for 29 MHz or crowded VHF/UHF environments.
- CTCSS/DCS Encoder/Decoder and 1750Hz Tone Encoder are built in.
- Discriminator Center Meter for precise tuning on Doppler-shifted FM satellite signals.



Specifications

GENERAL

Frequency Range:	Receive	100 kHz ~ 30 MHz 36 ~ 76 MHz 108-174 MHz 420 ~ 512 MHz
	Transmit	160 ~ 6 Metres 4 Metres (UK Model only) 2 Metres 70 Centi Metres (Amateur bands only)
Emission Modes:	USB, LSB, CW, AM, FM, F1 (9600 bps Packet), F2 (1200 bps Packet), AFSK	
Synthesizer Steps (Min.):	0.1 Hz (CW/SSB) 10 Hz (AM/FM)	
Antenna Impedance:	50 Ω, Unbalanced	
Operating Temp. Range:	-10°C ~ +50°C (14oF ~ 122oF)	
Frequency Stability:	Better than ±2 ppm (0oC ~ +40oC) SSB/CW/AM/AFSK Better than ±5 ppm (-10oC~+50oC) SSB/CW/AM/AFSK Better than ±1 kHz +5 ppm) FM DC 13.8V ±10%, Negative Ground	
Power Requirements:	Receive (Squelched): 1.5A Receive (Max. Audio): 2.0A Transmit: 22A (@ 100W RF output)	
Current Consumption:	260(W) x 86(H) x 270(D) mm (10.24" x 3.39" x 10.63") Approximately 7 kg (14.4 lbs.)	
Case Size:		
Weight:		
TRANSMITTER		
Power Output:	160 ~ 6m:	100 Watts (25 Watts AM carrier)
	2m/70cm:	50 Watts (12.5 Watts AM carrier)
Modulation Types:	SSB: Balanced Modulator FM: Variable Reactance AM: Early Stage (Low Level) ±5 kHz (±2.5 kHz on FM-N)	
FM Maximum Deviation:	Harmonics: At least 40 dB down (1.8 ~ 29.7 MHz) At least 60 dB down (50/144/430 MHz)	
Spurious Radiation:	Non-harmonic: At least 50 dB down (1.8 ~ 29.7 MHz) At least 60 dB down (50/144/430 MHz)	
Carrier Suppression:	At least 40 dB	

Opp. Sideband Suppression:	At least 40 dB
3rd-Order IMD:	At least 31 dB down (14 MHz, 100W PEP output) Slightly higher on 430 MHz
SSB Frequency Response:	400 Hz ~ 2600 Hz (-6 dB)
Max. Occupied Bandwidth:	SSB: Less than 3 kHz CW: Less than 0.5 kHz FM: Less than 16 kHz
Microphone Impedance:	200 Ω ~ 10k Ω (Supplied microphone: 600 Ω)

RECEIVER

Sensitivity:	SSB/CW	AM-N	FM
500 kHz ~ 1.8 MHz:	—	20 μV	—
1.8 ~ 28 MHz:	0.25 μV	1 μV	—
28 ~ 30 MHz:	0.25 μV	1 μV	0.5 μV
50 ~ 54 MHz:	0.20 μV	0.5 μV	0.25 μV
144/430 MHz:	0.125 μV	—	0.16 μV
(Above specifications are worst-case. SSB/CW/AM-N figures are for 10 dB S/N, 12 dB SINAD on FM)			
Squelch Sensitivity:	SSB/CW/AM	FM	
500 kHz ~ 1.8 MHz:	20 μV	—	
1.8 ~ 28 MHz:	2 μV	—	
28 ~ 30 MHz:	2 μV	0.25 μV	
50 ~ 54 MHz:	1 μV	0.20 μV	
144/430 MHz:	0.5 μV	0.16 μV	
Image Rejection:	Better than 60 dB		
IF Rejection:	Better than 60 dB		
Selectivity (-6/60 dB):	SSB/CW: 2.2 kHz/4.5 kHz CW-N: 0.5 kHz/2.0 kHz (Optional YF-115C installed) AM: 9 kHz/20 kHz AM-N: 2.2 kHz/4.5 kHz FM: 15 kHz/30 kHz FM-N: 9 kHz/20 kHz		
Audio Output:	At least 1.5W into 8 Ω @ 10% THD		
Audio output impedance:	4 Ω ~ 16 Ω		

OPTIONS

 MD-100A8X Desk Microphone	 MH-31B8 Hand Microphone	 YH-77STA Lightweight Stereo Headphones	 FVS-1A Voice Synthesizer Unit	 YF-115C 500 Hz CollinsR Mechanical CW Filter	 YF-1155-02 2.5 kHz CollinsR Mechanical SSB Filter	 MMB-66 Mobile Mounting Bracket
 FP-1030A Base Station Power Supply	 G-450C/650C/1000C Rotator	 G-5500* Azimuth-Elevation Rotator System	 G-550* Elevation Rotator	 FC-20 Automatic Antenna Tuner	 ATAS-100 Active-Tuning Antenna System	<p>SPECIFICATIONS Frequency bands covered: 7/14/21/28/50/144/430 MHz Length (include whip): 1.4 ~ 1.6 meters Weight: Approx. 930 g Input Impedance: 50 Ω Maximum Input Power: 120W SSB (HF) 100W FM (29/50 MHz) 50W FM (144/430 MHz)</p> <p>VSWR: Less than 2:1 Note: ATAS-100 does not include mobile mount nor coaxial cable.</p>

* This model does not comply with CE Marking specs

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