Professional Communications Receiver

IC-R9500

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TECHNICAL SPECIFICATIONS

Icom America Inc.

Frequency

Range for USA**:	0.005 - 821.999999 MHz, 851 - 866.999999 MHz, 896-3335 MHz
Resolution	1 Hz
Tuning steps – fixed	1, 10, 100 Hz; 1, 2.5, 5, 6.25, 9, 10, 12.5, 20, 25, 100 kHz, 1 MHz Can specify which steps are ON for each reception mode
Tuning steps – program	One for each reception mode 0.1 to 999.9 kHz in 0.1 kHz increments
Stability	
At room temperature	$< \pm 5 \times 10^{-8}$ (+25° C) (after 5 min warm up)
With temperature change	$< \pm 5 \times 10^{-8}$ (0° C to +50° C)
Aging rate	$< \pm 1 \times 10^{-7}$ per year

Reception Modes and Features

Reception modes	USB, LSB, CW, FSK, AM, FM, WFM, P25* * Optional UT-122 required
Reception features	
AM	Synchronous (S-AM); upper, lower or both sidebands; auto tuning function ± 5 kHz (nominal)
FM	AFC function
SSB	Auto tuning function ± 1 kHz (nominal)
CW	Normal and reversed (opposite side band); auto tuning function ± 500 Hz (nominal); audio peak filter (APF) to enhance audio
Analog TV tuner	NTSC, PAL, SECAM (Except USA version)

Digital IF Bandpass Filter

Bandwidths	
AM	200 Hz to 10 kHz in 200 Hz steps
SSB, CW, FSK	50 to 500 Hz in 50 Hz steps; 600 to 3600 Hz in 100 Hz steps (2700 Hz max for FSK)
FM	7, 15, 50 kHz
WFM	180 kHz
P25	15 kHz (optional UT-122 required)
Shape	Sharp, soft
Selectivity	(with sharp shape)
SSB, FSK (BW=2.4 kHz)	-3 dB: >2.4 kHz -60 dB: <3.6 kHz shape factor <1.5:1
CW (BW=500 Hz)	-3 dB: >500 Hz -60 dB: <700 Hz shape factor <1.4:1
AM (BW=6 kHz)	-3 dB: >6.0 kHz -60 dB: <15.0 kHz shape factor <2.5:1
FM (BW=15 kHz)	-3 dB: >12.0 kHz -60 dB: <25.0 kHz shape factor <2.1:1
WFM (BW=180 kHz)	-6 dB: >180 kHz

Digital IF PBT and Notch Filters

Pass band tuning (PBT)	Twin with graphical display
Notch filter – auto (ANF)	For SSB, AM, FM, WFM Attenuates up to 3 beat tones
Notch filter - manual	For SSB, CW, AM, FSK
Width	Wide, middle, narrow
Rejection	> 70 dB at two points
Center frequency range (nominal)	SSB: -1060 to + 4400 Hz CW: CW pitch freq. ± 2540 Hz AM: ± 5100 Hz

Dynamic Range

Roofing filter bandwidths (IF Prefilter at 1st IF)	3, 6, 15, 50 kHz, (except WFM) 240 kHz (WFM only)
Third-order intermodulation distortion	(100 kHz separation, Pre-amp OFF, AGC OFF)
IP3 at 14.1 MHz	> +40 dBm
IP3 at 50 MHz	> +9 dBm
IP3 at 620 MHz	> +6 dBm
IP3 at 30 MHz to 3335	+5 dBm (typical)
Dynamic range (3rd order IMD)	109 dB (typical) at 14.1 MHz; (100 kHz separation, Pre-amp OFF, AGC OFF)
Spurious and image rejection	
0.1 – 30 MHz	> 70 dB
30 – 2500 MHz	> 50 dB
2500 – 3000 MHz	> 40 dB
Oscillator phase noise	(typical)
0.1 – 30 MHz	<-120 dBc/Hz at 10 kHz offset
30 – 1500 MHz	<-100 dBc/Hz at 10 kHz offset

Signal Level Meter (RSSI)

Units	S-meter, dBμ, dBμ(emf), dBm (Only S-meter for WFM)
Resolution	0.1 dB
Accuracy	± 3 dB for 10 to 70 dBμ signal from 100 kHz to 3335 MHz at 25° C ATT = 0 dB, Pre-amp ON or OFF

Sensitivity

Frequency	SSB, CW, FSK	AM	FM	FM 50 kHz	WFM
0.100 – 1.799 MHz*1	0.5 μV	6.3 μV	–	–	–
1.800 – 29.999 MHz*1	0.2 μV	2.5 μV	0.5 μV*3	0.71 μV*3	–
30 – 2999.999 MHz*2	0.32 μV	3.5 μV	0.5 μV	0.71 μV	1.4 μV
3000 – 3335 MHz*2	1.0 μV	11 μV	1.6 μV	2.2 μV	4.5 μV

*1 Pre-amp 1 ON *2 Pre-amp ON *3 f = 28 – 29.999 MHz

SSB, FSK BW= 2.4 kHz at 10 dB S/N
CW BW= 0.5 kHz at 10 dB S/N; AM BW = 6.0 kHz at 10 dB S/N
FM BW=15 kHz at 12 dB SINAD; FM 50 k BW=50 kHz at 12 dB SINAD
WFM BW=180 kHz at 12 dB SINAD

Noise figure	(typical)
1.800 – 29.999 MHz	< 5.5 dB Pre-amp 1 ON
30 – 1599.999 MHz	< 6.5 dB Pre-amp ON
1600 – 2999.999 MHz	< 8.0 dB Pre-amp ON

**Depending on version. Full range version (0.005 - 3335 MHz) available to USA government authorized users only.

Receiver Front-End

Input BPF unit	
HF bands	11 switched, 5th-order BPF
VHF/UHF	11 switched, 7th-order LPF and 7th-order HPF
Attenuator	
HF bands	6, 12, 18, 24, 30 dB
30 – 1150 MHz	10, 20, 30 dB
1150 – 3335 MHz	20 dB only
Pre-amp gain	
HF bands	10 dB (nominal) or high-gain
30-2000 MHz	10 dB (nominal)
2000 – 3000 MHz	5 to 10 dB (nominal)

Intermediate Frequencies

1st	58.7 MHz (0.1 – 29.99999 MHz) 778.7 MHz (30.0 – 499.99999 MHz); 278.7 MHz (500.0 – 3335 MHz)
2nd	10.7 MHz (0.1 – 29.99999 MHz) 58.7 MHz (30.0 – 3335 MHz)
3rd	48 kHz (0.1 – 29.99999 MHz) 10.7 MHz (30.0 – 3335 MHz)
4th	None (0.1 – 29.99999MHz) 48 kHz (30.0 – 3335 MHz)

Memory Channels

Regular memory	1000 channels
Auto memory write	100 channels
Skip memory	100 channels
Scan edge memory	20 channels
Channel parameters stored (for regular memory)	Frequency, mode, filter, tuning step, name, antenna, pre-amp, attenuation, tone
Memory banks	13 for grouping channels
VFO channel memory	10 channels

Multi-scan Functions

Scan speed	40 channels per second in memory scan mode
Scan types	Programmed, ΔF, memory, select memory, priority, mode select memory, auto memory write, tune

Squelch

Sensitivity	1.8 – 2999.999 MHz, pre-amp ON
FM	< 1.0 μV
SSB	< 4.0 μV
AM	< 6.0 μV
WFM	< 6.0 μV
Range	> 85 dB (typical)
Voice squelch control (VSC)	Opens squelch only when receiving a modulated signal
Tone/DTCS squelch	Opens squelch only when receiving a signal containing a matching subaudible tone (51 tones available) or DTCS code (104 codes available)

Amplitude

AGC time constant (60 dB)	Fast, Mid, Slow
AM, SSB, CW, FSK	(time constant can be set for the 3 settings for each reception mode) 0.1*1, 0.2*1, 0.3, 0.5, 0.8, 1.2, 1.6, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0*2, 8.0*2 seconds *1 0.1 and 0.2 only for SSB, CW, FSK *2 7.0 and 8.0 only for AM
FM, WFM, P25	Fixed at 0.1 second
Manual RF gain control	> 90 dB range
Noise blanker	Two independent with settable depth and width
Noise reduction	Reduces random noise components

Spectrum Scope

Normal mode	
Span modes	Center and Fixed
Frequency span	±(2.5, 5, 10, 25, 50, 100, 250, 500)kHz ±(1, 2.5, 5) MHz
Resolution bandwidth	0.2, 0.5, 1, 2, 5, 10, 20 kHz (some spans have fewer bandwidths)
Sweep speed	6 speeds available
Display dynamic range	90 dB
Attenuator	10, 20, 30 dB
Peak marker function	peak excursion 0 to 80 dB; peak threshold -100 to 0 dB; 1 dB steps
Max hold function	Displays maximum levels until reset
Wide mode	(AF output muted)
Frequency span	±(5, 10, 25, 50, 100, 250, 500) MHz
Resolution bandwidth	20 kHz

Display

Type	Color TFT LCD
Resolution	800 x 480 pixels
Size	180 mm (7.0 in) diagonal (nominal)

Saving and Recording

Data files	Memory channel contents can be saved and recalled from built-in CF (Compact Flash) memory card or USB memory.
Digital voice recorder normal mode	Record to internal CF card or external USB memory
Sampling rate	8, 12, 16, 24, 48 kHz (WAV format)
Recording time - internal	60 min with 16 kHz sampling rate and 128 MB CF card (nominal)
Digital voice recorder short mode	Allows playback of last 5 to 30 seconds

Inputs and Outputs

Antenna HF (< 30 MHz)	SO-239 50 Ω (nominal) Phono (RCA) 500 Ω (nominal) Reverse power protection 5 W (nom.)
Antenna 30 – 1149.99999 MHz	Type-N 50 Ω (nominal)
Antenna 1150 – 3335 MHz	Type-N 50 Ω (nominal)
Antenna Select	2-conductor 3.5 mm (⅛ in) 13.8 V DC, 100 mA max
Reference In/Out 10 MHz	BNC, -10 dBm, 50 Ω (nominal)
IF Out	BNC, 10.7 MHz; level same as antenna input signal, or less when AGC or atten is on
Ext Speaker	2-conductor 3.5 mm (⅛ in) > 2.6 W at 10% distortion with an 8 Ω load (nominal)
S/P DIF Out	Optical, 48 kHz 16-bit
Video In	Phono (RCA)
Video Out	Phono (RCA) for TV signal (no signal out on USA version)
Ext Display	15-pin mini D-SUB; VGA compatible
Detector Out	2-conductor 3.5 mm (⅛ in)
Speech Out	Phono (RCA)
Line Out	Phono (RCA)
Phones (front panel)	3-conductor 3.5 mm (⅛ in)
Record Out (front panel)	3-conductor 3.5 mm (⅛ in)
Record Remote (front/rear)	2-conductor 3.5 mm (⅛ in)
DC Out	15 VDC (nominal), 1 A max
Accessory	8-pin DIN

Data Interfaces

USB	USB Type "A"; USB 1.1/2.0 Output current 500 mA max For USB memory, hub, or keyboard (Save/Load memory and settings; edit channel memory with keyboard)
LAN	RJ45 10BaseT/100BaseT For firmware updates using a PC
RS-232C	9-pin mini D-SUB; for remote control by a PC or transceiver operation
Data In	8-pin DIN; CI-V for remote control (requires optional CT-17 CI-V level converter)
Remote CI-V	3-conductor 3.5 mm (⅛ in)

General

Operating temperature range	0° C to +50° C; +32° F to +122° F
Power supply req. AC	100/120/230/240 V 47 to 63 Hz
Power supply req. DC	13.5 to 15 V DC (negative ground) from a regulated DC supply of ≥10 A. *Not to be connected to an unregulated power source such as a vehicle battery.*
Power consumption AC	< 100 VA
Dimensions (W x H x D) (projections not included)	424 x 149 x 340 mm 16 11/16 x 5 7/8 x 13 3/8 in
Weight	20 kg; 44 lb (nominal)

Options

CT-17	CI-V Level Converter For remote receiver control using a PC with RS-232C
UT-122	P25 Digital Unit provides APCO P25 digital mode reception
SP-20	External Speaker
Shipping crate	Dimensions: 74 x 81 x 86 cm 29 x 32 x 34 in

IC-R9500 Rear View

All features and specifications may be subject to change without notice or obligation.

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