

# IC-R8600

HIGH PERFORMANCE SOFTWARE DEFINED RECEIVER



- 10 kHz – 3.0 GHz Super Wideband
- P25, NXDN™, dPMR™, D-STAR Mode
- Real-time Spectrum Scope with Waterfall
- Software Demodulation by FPGA Processing



# Exciting Innovation in the Professional Communications Receiver World

The IC-R8600 is a super wideband 10 kHz to 3 GHz communication receiver that enables you to hear and see a wide variety of signals in various ways. Not only does it decode diverse digital communication signals, but the advanced FPGA processing technologies implemented provide clarity and accuracy of received signals. With the optional remote control software for a Windows® PC, received audio and spectrum scope data can be transferred through an IP network for monitoring from remote locations.

## Superior Performance

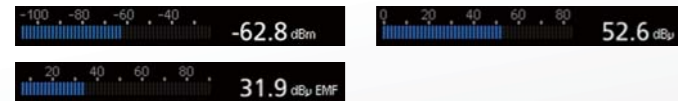
### 10 kHz to 3 GHz Super Wideband Coverage

The IC-R8600 decodes various digital protocol signals including P25 (Phase 1), NXDN™, dPMR™, D-STAR, Japanese DCR (Digital Convenience Radio) as well as receives conventional analog signals such as USB, LSB, FSK, CW, AM, S-AM (Synchronous-AM), FM and WFM modes, covering 10 kHz to 3 GHz wideband in 1 Hz steps.

### Absolute Value of RSSI (Received Signal Strength Indicator)

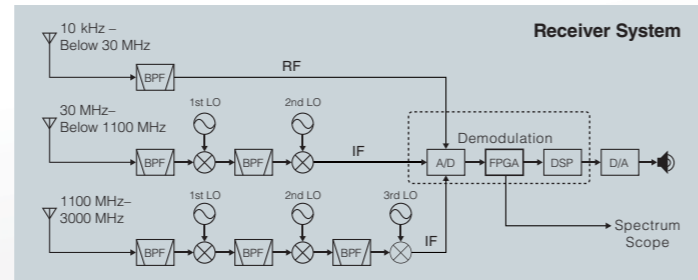
The IC-R8600 shows S-meter, dBμ, dBμ (emf) and dBm meter types in the RSSI. The dBμ, dBμ (emf) and dBm meter has a high ±3 dB accuracy\* (between 0.5–1100 MHz) that can be used for measuring signal strength level.

\* Less than ±6 dB between 1100–3000 MHz.



### Software Demodulation in FPGA Processing

The IC-R8600 utilizes FPGA (Field Programmable Gate Array) and DSP units for demodulation, decoding and most of signal processing. Direct HF signals and intermediate frequency signals, which are converted from VHF/UHF signals, are digitized in a 14-bit A/D converter and transferred to the FPGA and DSP for optimal processing. The high-rate 122.88 MHz sampling frequency used for the A/D converter results in superior aliasing and image reception reduction.



### Superb Receiver Performance

The IC-R8600 has 11 discrete RF bandpass filters in the HF bands and 13 bandpass filters in the VHF/UHF bands. To prevent overflow, only the intended signal is passed, while any out of range strong interference signals are rejected. The IC-R8600 provides +30 dBm IP3 and 105 dB dynamic range at 14.1 MHz. IP3 performance is +10 dBm at 144 MHz and 0 dBm at 440 MHz.

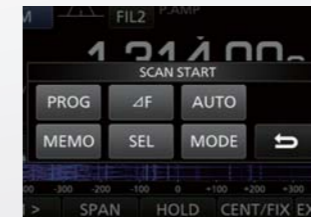
### Ample Memory Channels

The IC-R8600 has up to 2000 regular memory channels assignable to 100 groups. In addition to the regular memory channels, up to 100 scan skip channels and 50 pairs of program scan edges can be set. The auto memory write scan automatically stores busy frequencies in the auto memory write channels (up to 200 channels). These memory channels and various settings can be edited with the optional CS-R8600 programming software on a Windows® PC.

### Variety of Scan Functions

A variety of scan functions effectively and thoroughly search for desired stations. The IC-R8600 scans up to 100 channels per second in the memory scan mode.

- Program scan/Fine program scan
- Δf scan/Δf fine scan
- Priority scan
- Memory scan
- Selected memory scan
- Selected mode memory scan
- Auto memory write scan



Scan setting screen

## Intuitive Operation

### Real-time Spectrum Scope with Waterfall Function

The high-resolution real-time spectrum scope provides class-leading performance in resolution, maximum 30 frames per second\* fast sweep speed, ±2.5 MHz wide scope span (display range) and 110 dB of dynamic range (at ±2.5 kHz span). The waterfall screen allows you to find weak signals by showing the spectrum change over time. When tapping the spectrum scope or waterfall screen, the tapped area can be selected as the operating frequency. The peak search function finds several peak frequencies within the scope range, and helps you to select these. (\* Approximate)

### Quick, Smooth and Intuitive Operation

To efficiently acquire intended signals, the IC-R8600 user interface provides quick and accurate operation. The large 4.3-inch color display, with touch screen function, is configured to collect operating information. By tapping indications and icons on the screen, the setting menu will pop up and parameters can easily be adjusted. When either the DIAL A, B or C multi-function control knobs is pushed, various functions, such as scan speed, RF gain, audio tone, display backlight or other menus will pop up on the display.



Pop up menu appears by pushing DIAL B



Functions menu for touch screen operation



Actual Size

## Extensive Rich Features

### SD Card Slot for Receiver Recorder

The recorder function can record received audio onto an SD card in WAVE format. The recorded voice audio can be played back on the receiver or a PC. When a 32 GB SD card is used, up to 270 hours of recording is possible. In addition, the screen capture function saves a snap shot of the screen in PNG or BMP format on the SD card.

\* An SD card is required separately.

### Remote Control Function through IP Network or USB Cable

The optional RS-R8600 PC remote control software allows you to listen to received audio and control most of the receiver functions, including the spectrum scope, through an IP network or USB cable.



RS-R8600 screen

### I/Q Signal Output

The I/Q signal output function\* allows you to derive digital IF signals from the I/Q output jack. It can be used for analyzing spectrum or decoding signals.

\* This function will be provided with future firmware update. A third-party software may be required separately.

### Other Features

- 3 antenna connectors: an SO-239 type and a phono (RCA) connector for HF and a type-N connector for VHF/UHF
- Clock and NTP function
- Center tuning meter and digital auto frequency control (AFC) for FM, WFM and digital modes
- Voice synthesizer function
- Audio tone functions: HPF/LPF, bass, treble and de-emphasis
- Decode multiple digital code used in digital mode
- IP+ function improves 3rd order intercept point performance
- Main dial friction adjustment
- Dial lock and panel lock
- CI-V remote control commands
- RX history log for digital modes

COMMUNICATIONS RECEIVER

# IC-R8600

## SPECIFICATIONS

GENERAL	
Frequency coverage	USA 0.010000–821.999999*, 851.000000–866.999999, 896.000000–3000.000000 MHz (*Guaranteed range: 0.100000–821.999999 MHz) EXP 0.010000–3000.000000 MHz (*Guaranteed range: 0.100000–3000.000000 MHz)
Antenna connector	ANT 1 (0.01–3000 MHz): Type-N (50 Ω) ANT 2 (0.01–30 MHz): PL-259 (50 Ω) ANT 3 (0.01–30 MHz): RCA (500 Ω)
Frequency stability	Less than ±0.5 ppm (at 25 °C after warm up)
Mode	USB, LSB, CW, FSK, AM, FM, WFM, Digital (D-STAR, P25 Phase 1, NXDN, dPMR, DCR)
Number of channels	2000 regular with 100 groups, 200 auto memory write, 100 skip and 100 scan edge channels
Scan types	Programmed, memory, selected memory, selected mode, auto memory write, priority scan and Δf scan
Power supply requirement	13.8 V DC ±15%
DC current drain	Stand-by: 1.8 A, Maximum audio: 2.0 A
Operating temperature range	–10 °C to +60 °C; 14 °F to 140 °F
Frequency resolution	1 Hz
Dimensions (W × H × D) (projections not included)	220 × 90 × 230 mm; 8.7 × 3.5 × 9.1 in
Weight (approximately)	4.3 kg; 9.5 lb

**Supplied accessories:** (May differ, depending on the receiver version)  
 • DC power cable • Fuses • Plugs

RECEIVER					
Receiver system	0.010–29.999 MHz Direct sampling 30.000–499.999 MHz Double superheterodyne (IF: 778.7, 46.35 MHz) 500.000–1099.999 MHz Double superheterodyne (IF: 278.7, 46.35 MHz) 1100.000–1499.999 MHz Triple superheterodyne (IF: 900–500.000001, 278.7, 46.35 MHz) 1500.000–3000.000 MHz Triple superheterodyne (IF: 1000–500, 278.7, 46.35 MHz)				
Sensitivity*1 (Preamp ON)	0.1–1.799 MHz	1.8–29.999 MHz	30–1099.999 MHz	1100–1999.999 MHz	2000–3000 MHz
SSB/CW/FSK (at 10 dB S/N)	–6 dBμ	–14 dBμ	–10 dBμ	–10 dBμ	–8 dBμ
AM (at 10 dB S/N)	16 dBμ	8 dBμ	15 dBμ	15 dBμ	15 dBμ
FM (at 12 dB SINAD)	–	–6 dBμ*2	–6 dBμ	–6 dBμ	–4 dBμ
WFM (at 12 dB SINAD)	–	–	3 dBμ	3 dBμ	5 dBμ
D-STAR, NXDN, dPMR (1% BER)	–	–2 dBμ*2	–2 dBμ	–2 dBμ	0 dBμ
P25 (5% BER)	–	–5 dBμ*2	–5 dBμ	–5 dBμ	–3 dBμ
*1 BW: WFM=180 kHz, FM=15 kHz, AM=6 kHz, SSB/FSK=2.4 kHz, CW=0.5 kHz *2 28–29.999 MHz					
Selectivity	More than		Less than		
LSB/USB/FSK (BW: 2.4 kHz)	2.4 kHz/–3 dB		3.6 kHz/–60 dB		
CW (BW: 500 Hz)	500 Hz/–3 dB		700 Hz/–60 dB		
AM (BW: 6 kHz)	6.0 kHz/–3 dB		15.0 kHz/–60 dB		
FM (BW: 15 kHz)	12.0 kHz/–6 dB		25.0 kHz/–60 dB		
WFM	180 kHz/–6 dB				
Spurious and image rejection	(Analog mode operation)				
0.010–29.999 MHz	More than 70 dB				
30.000–1099.999 MHz	More than 50 dB				
1100.000–2499.999 MHz	More than 40 dB*3				
2500.000–3000.000 MHz	More than 40 dB*3				
*3 More than 35 dB for 1st IF through above 1100 MHz. More than 30 dB for 1st IF image above 2000 MHz.					
Audio output power	More than 2.0 W (8 Ω load, 10% distortion)				

All stated specifications are subject to change without notice or obligation.

## OPTIONS

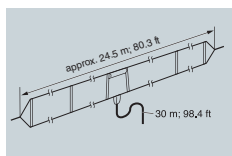
Some options may not be available in some countries. Please ask your dealer for details.



**AH-8000 SUPER WIDEBAND OMNIDIRECTIONAL ANTENNA**  
 Frequency coverage: 100–3335 MHz



**SP-39AD EXTERNAL SPEAKER WITH DC POWER SUPPLY**  
 High quality audio and matching height  
 Speaker maximum input: 7 W, 8 Ω  
 Power supply output: 15 V/2 A



**AH-710 FOLDED DIPOLE ANTENNA**  
 Covers 1.9–30 MHz bands.



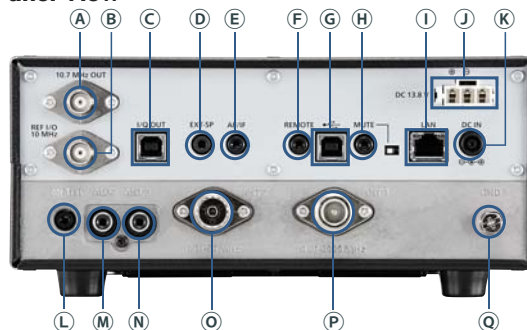
**SP-23 EXTERNAL SPEAKER**  
 4 audio filters; headphone jack.  
 Input impedance: 8 Ω  
 Max. input power: 5 W



**AD-55NS POWER SUPPLY**  
 Input: 100–240 V/1 A  
 Output: 15 V/2 A

- **MB-123** CARRYING HANDLE
- **CS-R8600** PROGRAMMING SOFTWARE for Windows® PC
- **RS-R8600** REMOTE CONTROL SOFTWARE for Windows® PC

## Rear Panel View



- A 10.7 MHz IF Output Jack
- B 10 MHz Reference Frequency Input/Output
- C I/Q Output Jack
- D External Speaker Jack
- E AF/IF Output Jack
- F CI-V Remote Control Jack
- G USB Connector
- H MUTE Jack
- I LAN (Ethernet) Connector
- J 13.8V DC Power Socket
- K DC IN Jack (For use with AD-55NS or SP-39AD)
- L S-meter Output Jack
- M AUX Jack
- N RCA Antenna Connector (HF: 500 Ω)
- O PL-259 Antenna Connector (HF)
- P Type-N Antenna Connector (HF/VHF/UHF)
- Q Ground Terminal

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**Icom Inc.** 1-1-32, Kamiminami, Hirano-Ku, Osaka 547-0003, Japan Phone: +81 (06) 6793 5302 Fax: +81 (06) 6793 0013

[www.icom.co.jp/world](http://www.icom.co.jp/world)

**Count on us!**

**Icom America Inc.**  
 12421 Willows Road NE,  
 Kirkland, WA 98034, U.S.A.  
 Phone: +1 (425) 454-8155  
 Fax: +1 (425) 454-1509  
 E-mail: sales@icomamerica.com  
 URL: <http://www.icomamerica.com>

**Icom (Europe) GmbH**  
 Communication Equipment  
 Auf der Krautweide 24  
 65812 Bad Soden am Taunus, Germany  
 Phone: +49 (6196) 76685-0  
 Fax: +49 (6196) 76685-50  
 E-mail: info@icomeurope.com  
 URL: <http://www.icomeurope.com>

**Icom France s.a.s.**  
 Zac de la Plaine,  
 1 Rue Brindejonc des Moulinais, BP 45804,  
 31505 Toulouse Cedex 5, France  
 Phone: +33 (5) 61 36 03 03  
 Fax: +33 (5) 61 36 03 00  
 E-mail: icom@icom-france.com  
 URL: <http://www.icom-france.com>

**Icom Canada**  
 Glenwood Centre #150-6165  
 Highway 17A, Delta, B.C.,  
 V4K 5B8, Canada  
 Phone: +1 (604) 952-4266  
 Fax: +1 (604) 952-0090  
 E-mail: info@icomcanada.com  
 URL: <http://www.icomcanada.com>

**Icom Spain S.L.**  
 Ctra. Rubi, No. 88 "Edificio Can Castanyer"  
 Bajos A 08174, Sant Cugat del Valles,  
 Barcelona, Spain  
 Phone: +34 (93) 590 26 70  
 Fax: +34 (93) 589 04 46  
 E-mail: icom@icomspain.com  
 URL: <http://www.icomspain.com>

**Icom (Australia) Pty. Ltd.**  
 Unit 1 / 103 Garden Road,  
 Clayton, VIC 3168 Australia  
 Phone: +61 (03) 9549 7500  
 Fax: +61 (03) 9549 7505  
 E-mail: sales@icom.net.au  
 URL: <http://www.icom.net.au>

**Icom Brazil**  
 Rua Itororó, 444 Padre Eustáquio  
 Belo Horizonte MG,  
 CEP: 30720-450, Brazil  
 Phone: +55 (31) 3582 8847  
 Fax: +55 (31) 3582 8987  
 E-mail: sales@icombrasil.com

**Icom (UK) Ltd.**  
 Blacksole House, Altira Park,  
 Herne Bay, Kent, CT6 6GZ, U.K.  
 Phone: +44 (0) 1227 741741  
 Fax: +44 (0) 1227 741742  
 E-mail: info@icomuk.co.uk  
 URL: <http://www.icomuk.co.uk>

**Asia Icom Inc.**  
 6F No. 68, Sec. 1 Cheng-Teh Road,  
 Taipei, Taiwan, R.O.C.  
 Phone: +886 (02) 2559 1899  
 Fax: +886 (02) 2559 1874  
 E-mail: sales@asia-icom.com  
 URL: <http://www.asia-icom.com>

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