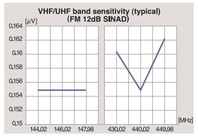
VHF/UHF functions and features

Superb readability in the VHF/UHF band

The IC-9100 provides excellent receiver sensitivity in the VHF/UHF bands, equivalent to the highly-acclaimed previous VHF/UHF dedicated model, the IC-910H. The IF DSP greatly improves intermodulation and noise elimination and offers better readability than the IC-910H.



Ready-to-install 1200MHz band unit

By installing the optional UX-9100 1200MHz band unit, you can be operational on the 1200MHz band immediately. The IC-9100 fully covers the HF/50, 144, 430/440 and 1200MHz amateur bands in multiple modes.

UX-9100, 1200MHz band unit

Satellite mode operation

The satellite mode synchronizes the uplink (transmitting) and downlink (receiving) frequencies, and tracks the frequencies in the same tuning step. This function matches both normal and reverse mode satellites. Compensation of the Doppler effect can be performed easily. 20 satellite memory channels store frequencies, mode and tone settings for quick set-up.

Optional D-STAR* DV mode

(* Digital Smart Technology for Amateur Radio)

The optional UT-121 provides D-STAR DV mode digital voice and low speed data communication. Linking of D-STAR repeaters over the Internet allows you to communicate virtually anywhere. In addition to 144MHz, 430/440MH and 1200MHz band, the D-STAR DV mode can be used in 28MHz and 50MHz band simplex mode.

- D-STAR DR mode operation makes it easy to access D-STAR repeaters
- GPS position reporting functions
  (External GPS receiver can be connected via data 1 connector. Position data can be entered manually.)
- One-touch reply function
- Digital call sign squelch
- Received call sign record
- Automatic received message display

UT-121, D-STAR UNIT

Received GPS data indication example

Other VHF/UHF features

- VSC (Voice Squelch Control) function
- AFC function (FM/DV mode)
- CTCSS and DTCS tone encoder and decoder
- 9600bps data socket
- Automatic repeater function* and one-touch repeater function
  (* USA and KOR versions only)

HF/VHF/UHF TRANSCEIVER

IC-9100

SPECIFICATIONS

GENERAL

- Frequency coverage (unit: MHz)*1 :

Receive	0.030–	60.000*2	136.000–	174.000*2
	420.000–	480.000*2	1240.000–	1320.000*2*3
Transmit	1.800–	1.999	3.500–	3.999
	5.255–	5.405*2	7.000–	7.300
	10.100–	10.150	14.000–	14.350
	18.068–	18.168	21.000–	21.450
	24.890–	24.990	28.000–	29.700
	50.000–	54.000	144.000–	148.000
	430.000–	450.000	1240.000–	1300.000*3

*1 Showing USA version, frequency coverage depends on version.
*2 Some frequency ranges are not guaranteed, *3 With optional UX-9100.

- Mode : USB, LSB, CW, RTTY (FSK), FM, AM*, DV (with UT-121)
  * Transmit HF/50MHz only. Cannot receive on 1200MHz band.
- No. of memory channels : 396 Ch* (99 Ch for each HF/50, 144, 430/440, 1200MHz band)
  4 Call Ch* (1 Ch for each band)
  24 Scan edges* (6 Ch for each band)
  20 satellite and 50 GPS memories
  * With optional UX-9100.
- Power supply requirement : 13.8V DC ±15 %
- Operating temp. range : 0°C to +50°C; +32°F to +122°F
- Frequency stability : Less than ±0.5ppm (0°C to +50°C)
- Current drain (at 13.8V DC) : IC-9100 UX-9100

TX	Max. power	24.0A	9.0A
RX	Max. audio	4.5A	5.5A

- Antenna connector :

HF/50MHz	SO-239 (50Ω)×2
144MHz	SO-239 (50Ω)
430/440MHz	Type-N (50Ω)
1200MHz	Type-N (50Ω) (With UX-9100)

- Dimensions (W×H×D) : 315×116×343 mm;
  (Projections not included) 12.4×4.57×13.5 in
- Weight (approx.) :

IC-9100	11kg; 24.3lb
UX-9100	950g; 2.1lb

TRANSMITTER

- Modulation system :

SSB	Digital PSN modulation
AM	Digital Low power modulation
FM	Digital Phase modulation
DV (With UT-121)	GMSK Digital Phase modulation

- Output power :

	HF/50MHz	144MHz	440MHz	1200MHz*1
SSB/CW/RTTY/FM/DV*2	2–100W	2–100W	2–75W	1–10W
AM	2–30W	–	–	–

*1 With UX-9100 *2 With UT-121

- Spurious emissions (Unwanted emission) :

1.8–29.7MHz	Less than –50dB
50, 144MHz	Less than –63dB
430/440MHz	Less than –61.8dB
1200MHz	Less than –53dB (With UX-9100)

- Carrier suppression : More than 40dB
- Unwanted sideband : More than 55dB
  1200MHz : More than 40dB (With UX-9100)
- Microphone connector : 8-pin connector (600Ω)

RECEIVER

- Intermediate frequencies :

HF/50MHz	64.455MHz, 36kHz
144MHz	10.850MHz, 36kHz
430/440MHz	71.250MHz, 36kHz
1200MHz(With UX-9100)	243.950MHz, 10.950MHz, 36kHz

- Sensitivity :

	0.5–1.8MHz	1.8–29.7MHz	50–54MHz	144/440MHz	1200MHz*1
SSB/CW	–	0.16μV*3	0.13μV*4	0.11μV	0.11μV
AM	12.6μV*3	2.0μV*3	1.6μV*4	1.4μV	–
FM	–	0.5μV*3*5	0.32μV*4	0.18μV	0.18μV
DV*2	–	1.0μV*3*5	0.63μV*4	0.35μV	0.35μV

SSB/CW, AM : 10dB S/N, FM : 12dB SINAD, DV : 1% BER
*1 With UX-9100 *2 With UT-121 *3 Preamp-1 ON *4 Preamp-2 ON *5 28–29.7MHz

- Selectivity :

SSB (BW: 2.4kHz, sharp)	More than 2.4kHz/–6dB
	Less than 3.4kHz/–40dB
CW	More than 500Hz/–6dB
(BW: 500Hz, sharp)	Less than 700Hz/–40dB
RTTY	More than 500Hz/–6dB
(BW: 500Hz sharp)	Less than 800Hz/–40dB
AM (BW: 6kHz)	More than 6.0kHz/–6dB
	Less than 10.0kHz/–40dB
FM (BW: 15kHz)	More than 12.0kHz/–6dB
	Less than 22.0kHz/–40dB
DV (with UT-121)	More than –60dB (12.5kHz spacing)
1200MHz (With UX-9100)	
SSB, CW	More than 2.3kHz/–6dB
FM	More than 15.0kHz/–6dB

- Squelch sensitivity (threshold):

	HF	50MHz	144MHz	440MHz	1200MHz*
FM	0.2μV*1	0.3μV*1	0.18μV	0.18μV	0.18μV
SSB	5.6μV*2	5.6μV*2	1.0μV	1.0μV	1.0μV

*1 With UX-9100 *2 Preamp-1 ON *3 Preamp-2 ON

- Spurious and image rejection ratio :

HF/50MHz	More than 70dB*
144, 430/440MHz	More than 60dB
1200MHz	More than 50dB (With UX-9100)

* Except IF through points on 50MHz band.

- Audio output power : More than 2.0W at 10% distortion (at 13.8V DC) with an 8Ω load
- EXT SP connectors : 2-conductor 3.5 (d) mm (1/8") /8Ω

Supplied accessories:
- Hand microphone, HM-36
- DC power cable
- Spare fuses
- Electronic keyer plug
- ACC cable (13-pin)

OPTIONS

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

IC-PW1/IC-PW1EURO
HF+50MHz 1kW
HF LINEAR AMPLIFIER

Covers all HF and 50MHz bands, provides clean, stable 1kW output.Automatic antenna tuner and compact detachable controller are standard. 2 exciter inputs are available.

AH-2b ANTENNA ELEMENT
For mobile operation with the AH-4. All bands between 7–54 MHz can be matched.

AH-4 HF+50MHz AUTOMATIC ANTENNA TUNER
Covers 3.5–54MHz with a 7m (23ft) or longer wire antenna.

PS-126 DC POWER SUPPLY
13.8V DC, 25A max. with 4-pin type connector.

HM-36 HAND MICROPHONE
Same as supplied.

SM-50 DESKTOP MICROPHONE
Unidirectional, dynamic microphone. [UP/DOWN] switches and low cut function are available.

SM-30 DESKTOP MICROPHONE
Compact, lightweight electret microphone. Low cut function is available.
SM-20 is also available.

CT-17 CI-V LEVEL CONVERTER
For external transceiver control using a PC with an RS-232C.

SP-21 EXTERNAL SPEAKER
Input impedance: 8Ω
Max. input power: 5W

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

UX-9100 1200MHz BAND UNIT
Allows you to operation on the 1200MHz band.

UT-121 D-STAR UNIT
Provides D-STAR DV mode capability at 4.8kbps (Voice + Data).

FL-430 6kHz 1st IF FILTER
FL-431 3kHz 1st IF FILTER
1st IF filters for HF/50MHz band.

OPC-1529R DATA CABLE
For D-STAR DV mode or GPS receiver connection. (Data 1 Jack (IC-9100) to RS-232C)

OPC-599 CABLE ADAPTER
Converts 13-pin ACC connector to 7-pin + 8-pin ACC connector.

- **CS-9100** CLONING SOFTWARE
  Allows memory channels and other settings from a PC. A USB cable is required for connection with a PC.
- **RS-BA1** IP REMOTE CONTROL SOFTWARE
  For IP remote transceiver control from a PC.

- **MB-123** CARRYING HANDLE
  Same as supplied.

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ICOM

HF/VHF/UHF TRANSCEIVER

IC-9100

HF
VHF
UHF
D-STAR
GPS
SATELLITE
EME

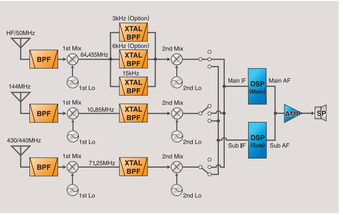
The All-round Transceiver, IC-9100

Double conversion & IF DSP technologies that support the IC-9100

Double conversion superheterodyne

Icom's basic idea about the best receiver circuit is to reproduce high fidelity audio without internal distortion. Our answer to achieve this goal is to adopt a double conversion superheterodyne system*. The double conversion system simplifies the electronic circuitry and reduces the number of components which cause internal distortion. The digital signal processing (DSP) technologies and image rejection mixer make it possible to adopt this system.

* A triple conversion system is used for the 1200MHz band.



Independent dual receivers

As seen in the above figure, the IC-9100 has 3 independent receiver circuits from the antenna connector to the second IF mixer (image rejection mixer). One each for HF/50MHz, 144MHz, 430/440MHz bands. See the table below for simultaneous receive pairs.

Main band \ Sub band	HF/50MHz band	144MHz band	430/440MHz band	1200MHz band
HF/50MHz	–	✔	✔	✔ *1
144MHz	✔	–	✔	✔ *1
430/440MHz	✔	✔	–	✔ *1
1200MHz	✔ *1	✔ *1	✔ *1	–

*1 With optional UX-9100.

32-bit floating point DSP & 24-bit AD/DA converters

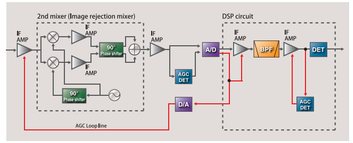
The heart of the IC-9100 is the proven combination of the 32-bit floating point DSP and 24-bit AD/DA converters. This powerful combination supports many digital processing features.

<DSP unit for the main band>
ADSP-21369
Internal clock speed: 333MHz
32-bit floating point DSP
Max. performance: 2000MFLOPS

<DSP unit for the sub band>
ADSP-21375
Internal clock speed: 266MHz
32-bit floating point DSP
Max. performance: 1600MFLOPS

AGC loop management

Digital IF filters, manual notch filter and other digital functions are incorporated in the AGC loop management controlled by the DSP unit. The AGC effectively works for the desired signal and rejects blocking by strong adjacent signals out of the filter passband. The AGC time constant presets (slow, medium and fast) give the flexibility and speed needed for working pile-ups.



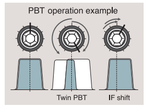
Digital IF filter

The IC-9100 DSP allows you to "build your own" digital IF filter. You can quickly choose bandwidth, shape factor, and center frequency, so that you can work that rare DX station. Three filter memories allow you to change filter settings instantly, a great help during contesting or other tough conditions.

Mode	Passband width range
SSB, SSB-D, CW	50Hz-500Hz (50Hz step), 600Hz-3600Hz (100Hz step)
RTTY	50Hz-500Hz (50Hz step), 600Hz-2700Hz (100Hz step)
AM, AM-D	200Hz-10.0kHz (200Hz step)
FM, FM-D, DV* (* option)	15kHz, 10kHz, 7.0kHz (Fixed)

Digital twin PBT and IF shift

After "building your own" digital IF filter, you can use the digital twin Passband Tuning (PBT) to shift and narrow the IF passband until the interference is gone and you can clearly hear that weak signal.



Noise reduction

The 16-step variable noise reduction can significantly enhance the receiver's signal-to-noise ratio, giving you a clean, clear audio signal that may make the difference between making the contact or not.

Noise blanker

The digital noise blanker reduces interference from pulse-type noise such as engine ignition. The noise blanker allows you to change the threshold level as well as blank duration parameter and attenuation level.

RF speech compressor

The digital RF speech compressor boosts average talk power, improving signal strength and readability in SSB mode. It is useful for for breaking through the noise and complete the QSO.

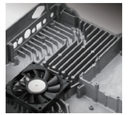
Adjustable transmit bandwidth

The transmit bandwidth is selectable from 100, 200, 300, 500Hz at the low-pass edge, and 2500, 2700, 2800, 2900Hz at the high-pass edge, respectively. Three types of high and low combinations can be stored in the memory as favorite settings.

HF/50MHz, 144MHz 100W, 430/440MHz 75W

The IC-9100 uses high efficiency power amplifiers and large heat sink providing stable output power, even during long periods of operation.


HF/50MHz FET 144MHz FET 430/440MHz FET


Heat sink

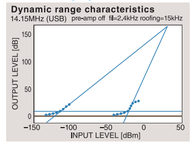
HF/VHF/UHF TRANSCEIVER

IC-9100

HF/50MHz functions and features

+30dBm class third-order intercept point

Using receiver design techniques introduced in Icom's highest grade HF transceivers, the IC-9100 has an IP3 of +30dBm (typ.) in the HF bands. Even a weak signal adjacent to strong signals is clearly received by the IC-9100.



Three first IF filters (3/6/15kHz) for HF/50MHz band

The IC-9100 comes with a built-in 15kHz 1st IF filter and can accept up to two optional filters (3kHz FL-431 and 6kHz FL-430). By changing the first IF filter width according to the operating mode, the desired signal is protected from adjacent inband signals at the later stages for better receiver performance.


1st IF filters (6kHz, 3kHz)

RTTY demodulator and decoder

The built-in RTTY demodulator and decoder allow you to instantly read an RTTY message on the display. No external units or PC required. The built-in tuning indicator visually helps in critical tuning.

Ample CW functions

All of the following CW capabilities are included in the IC-9100:
- 4 channels of keyer with 70 characters of memory per channel
- Multi-function electronic keyer with adjustable keying speed from 6-48 wpm, dot-dash ratio from 1:1:2.8 to 1:1:4.5 and paddle polarity
- Bug keyer and full break-in function

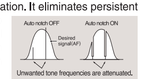
Built-in Antenna Tuner for HF/50MHz band

The internal antenna tuner automatically tunes for low SWR in the HF and 50MHz bands. Once you transmit on a frequency, the tuner can instantly retune the frequency using its built-in memory.


Antenna tuner

Manual notch filter and auto notch filter

The manual notch filter controlled by the DSP has extremely sharp characteristics and provides more than 70dB of attenuation. It eliminates persistent beat tones without affecting the AGC loop function. The automatic notch filter tracks and eliminates two or more interfering signals, such as beat signals and carriers or tones from digital signals.



Other HF/50MHz features

- Two preamplifier types for HF/50MHz bands: Preamp 1: Increases low level signal improving intermodulation, Preamp 2: High gain preamplifier
- Triple band stacking register • Quick split and frequency lock functions
- RIT and ΔTx variable up to ± 9.999kHz • SSB/CW synchronous tuning automatically shifts the carrier point when switching between CW and LSB/USB modes • AH-4 control circuit

HF to UHF common features

- Built-in voice synthesizer announces operating frequency, mode and S-meter level • User programmable band edge beep (Can be disabled)
- Microphone equalizer and adjustable transmit bandwidth • 20dB built-in attenuator • ±0.5ppm high frequency stability • Audio equalizer function • 1Hz pitch tuning and display • Automatic tuning steps • Program, memory, select memory, mode select and Δf scanning • Up to 424 memory channels* (* With optional UX-9100.) • Headphone separate function (left for main audio, right for sub audio)

Sophisticated operation with expansion capabilities

Large, Multi-function LCD

The large multi-function LCD displays frequency, 9-character channel name, channel number, multi functional meter (includes S-meter, RF output, SWR and ALC level) for both the main and sub bands vertically. The dot-matrix portion of the LCD shows the following items:

- Channel name
- Function key assignment
- Band scope
- RTTY decoder screen
- Memory keyer contents
- Graphical SWR scale
- D-STAR call sign, message, DR list
- GPS position information.

Band scope example

USB connector for PC control

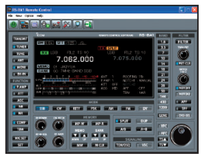
The IC-9100 has a standard type B USB connector and can be connected to a PC. Modulation input, audio output, RTTY demodulator output and CI-V command can be controlled via the USB cable. Also, the conventional CI-V remote control jack is built in to the IC-9100.

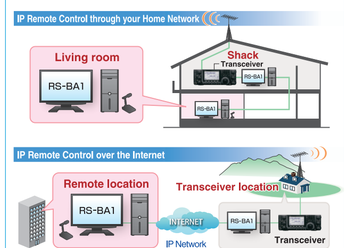
Optional CS-9100 programming software

When used with the optional CS-9100 programming software, memory channels, band edges, repeater list for DR mode, D-STAR callsign and GPS memory channels can be easily edited with a PC. A USB cable is required for PC connection.

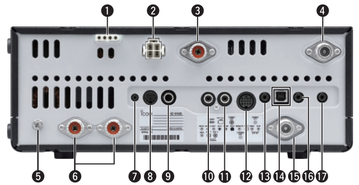
Optional RS-BA1 IP remote control software

The optional RS-BA1 allows you to use the IC-9100 from another room using your home network, or even from a remote location over the Internet. The RS-BA1 has low voice latency.





REAR PANEL VIEW



❶ Tuner Socket
❷ DC Power Socket
❸ 144MHz Antenna Connector
❹ 430/440MHz Antenna Connector
❺ Ground Terminal
❻ HF/50MHz Antenna Connectors
❼ Data1 Jack
❽ Data2 Jack
❾ Key Jack
❿ ALC Input Jack
⓫ Send Control Jack
⓬ ACC Socket
⓭ CI-V Remote Control Jack
⓮ USB Connector
⓯ 1200MHz Antenna Connector (With optional UX-9100)
⓰ External Speaker Jack (Main)
⓱ External Speaker Jack (Sub-band)

- Dimensions (W×H×D) : 315×116×343 mm; (Projections not included) : 12.4×4.57×13.5 in
- Weight (approx.) IC-9100 : 11kg; 24.3lb UX-9100 : 950g; 2.1lb