IC-7610 review

▶ **A Foundation primer**

▶ **SSB transceiver using Choc Board**

Icom IC-7610 review

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Photo 1: The IC-7610 and the SP-41 optional external speaker.

Two years ago Icom introduced their first RF direct sampling transceiver, the IC-7300. It was so well received by the general amateur market that it soon became a best seller. For an "entry level" rig, it was sure packed with great features and even at around $1600 (street pricing), it was well within the budget of many amateurs and some of its performance specs outperformed other transceivers costing thousands of dollars more.

However there was a bit of a gap between the top of the line IC-7851 and the new IC-7300; the IC-7600 was in need of an upgrade….. Enter the Icom IC-7610.

I got my first look at the IC-7610 at the Dayton Hamvention in May 2017. Aesthetically it looked great, well laid out with similarities to the IC-7851 and IC-7700 as well as the IC-7600 and IC-7300.

In August 2017 I attended the Tokyo Hamfair and was lucky enough to operate the "pre-release" IC-7610 on display at the event. It was very nice.

All of the talk at the event was that it was the next big advancement in amateur radio transceiver technology given it was utilizing RF Direct Sampling and should be available and released by Christmas 2017.

The Looks

A quick glance of the rig confirms that it is typically Icom in design. The front panel has that familiar layout, the set out knobs, controls and VFO with the huge sharp display is similar to all the other Icoms and functionality is quite intuitive compared to some of the radio manufacturers.

It really does resemble the IC-7600. However the IC-7610 now has a bank of touch screen buttons and a multi control instead of the row of mechanical buttons and rotary controls.

The display screen is huge… well 120% larger now and bright, quite a nice addition for those of us of the aging generation with less than perfect eyesight.

It has a nice solid feel about it, which is typical of Icom now days. The VFO is nice and smooth and the knobs are firm, no really noticeable wobble to note. Maybe it's because I am an Icom user but the controls are just so logically laid out it's a pleasure to use.

Dimensions are 340 mm x 118 mm x 277 mm (W x H x D) and mass is a very respectable 8.5 kg.

The rear panel is quite comprehensive with a myriad of connectors and ports. It has two switchable antenna connectors, BNC sockets for separate RX In/Out, a 10 MHz reference input socket and connectors for transverters. Two USB ports are included along with two DIN sockets for accessories, an Ethernet port and a DVI connector for an external monitor. Main/Sub receiver is well catered for with two speaker jacks, jacks/sockets for CI-V, CW keying, amplifier PTT keying, ALC, External Keypad and external tuner plug.

The Display

The large 7 inch (178 mm) display features just left of centre on the front panel. Being a touch screen it incorporates many of the IC-7610's functions and controls. Also included is the real time spectrum scope, a necessity nowadays for checking band activity. Being able to display 1 MHz bandwidth, enables full view of several of the HF bands. You can also split the screen to display main and sub receivers on the spectral scope.

The screen is a TFT LCD and is bright and sharp. It also includes a waterfall and real audio scope, great for checking TX and RX audio characteristics, distortion etc of either your own Tx or analyzing that incoming signal that sounds just

Photo 2: The rear panel of the IC-7610.

nasty all over the band…….

Frequently used controls like RF output power, Mic gain, compression etc. are available on the 'MULTI' knob and when pushed the functions are displayed on the top right of the display. Below the display screen is the MENU button which gives the user access to the 'Set Mode', this allows adjustment of display configuration, function settings, antenna setups and more.

Maybe a larger display would be nice, well just connect that spare external display to the DVI interface on the rear panel. Problem solved.

Tx

Icom's HM-219 electret hand mic is supplied with the IC-7610. It has up/down controls and Tx audio sounds surprisingly good straight out of the box. Audio is nice and sharp.

Of course you can add a desk mic or headset easily and you can even disable the DC supply to the mic socket if using a dynamic type microphone. TX audio parameters can be adjusted to suit your mic and voice characteristics as needed.

The internal Auto ATU typically matches up to a 3:1 VSWR but a nice additional feature included in the IC-7300 is also included in the IC-7610, Emergency mode. This enables the user to match an antenna with a 10:1 VSWR but at a reduced power level of 50 watts maximum to reduce stressing the ATU components.

For the CW users the IC-7610 has both Full and Semi break in as well as a multifunctional keyer.

The keyer has eight presets which can store up 70 characters each and like all recent Icom keyers, it can be programmed via screen and for contest use has incrementing serial numbers which are all stored on the front SD card.

RX, Dual Independent receivers

One of the shortcomings of the IC-7600 was the limitation of one receiver. However the IC-7610 has two independent receivers. This means you can listen to two different bands at the same time using the dual watch feature.
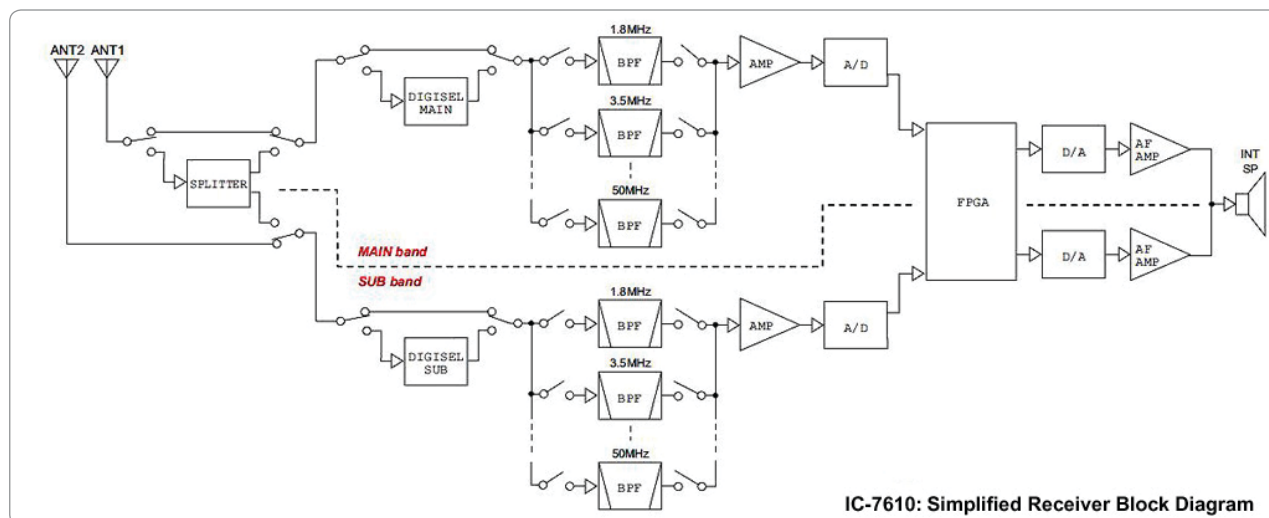

Figure 1: A simplified block diagram of the IC-7610.

Both receivers are fed from the same antenna port via an internal splitter, or you can utilize diversity where each receiver is fed by its own separate antenna port. For diversity reception, the main and sub RX can be locked together with the tracking feature. Split operation is now made easy as you can listen to the DX station and tune the pileup, listening to both at the same time.

A nice addition that has only been seen in the Icom flagship radios like the IC-7800, IC-7700 and IC-7850/51 series is "Digi Select". Icom states: The DIGI-SEL preselectors are RF filters with sharp, narrow passband characteristics preventing Analog-to-Digital Converter overflow from large out-of-band signals when sampling the RF signals. Additionally the third and higher order IMD components are reduced. This is ideal when strong signals are received in a contest pile-up or from broadcast stations on adjacent frequencies or bands.

Rotating the VFO knob will tune the radio but you can also use the touch screen and input direct frequency or if the waterfall is enabled, just touching the signal will change the frequency. Even point and click of the USB mouse is possible when you click on the scope area of the screen.

If that loud local pops up you can use the ATT button and have from 0 to 45 dB of attenuation using the MULTI knob in steps of 3 dB.

On Air

The IC-7610 is a delight to operate, its receiver is quiet and sensitive. Comparing it to my IC-7851, there was nothing that I could hear on the IC-7851 that was not copyable on the IC-7610, even the very, very weak stations. Utilizing the twin bandpass filters and the APF (audio peak filter) really enhances that weak CW station, the signal just leaps out of the noise. The DSP RX bandpass filters are sharp, and even in the crowded band during a CW contest, one can engage the filters, even down to 100 or 50 Hz and the QRM is gone. A nice feature of the filters, whether in SSB or CW is that they give a nice looking filter bandpass display on the screen. The notch filter is also nice, either in manual or auto mode and it has selectable bandwidths also, great

to remove that annoying heterodyne or tuner upper. DSP noise reduction is good for reducing the RX noise if your local noise floor is on the rise and with 15 levels there is sure to be a sweet spot for you.

Added bonuses

With the ever increasing local noise in the suburbs, many hams are looking for remote setups. The IC-7610 comes with an onboard RS-BA1 remote server, so you just need to configure the internal settings, plug in the Ethernet cable and with the RS-BA1 software on your PC you can operate your IC-7610 via remote, either from home in the next room or from the other side of the globe.

The IC-7610 has built in RTTY/PSK on screen encoder/decoder and a quick setup of the memories will enable RTTY and PSK contact with just a push of a button…no other equipment needed.

Two rear USB ports can be used to control the transceiver, one via a PC using CIV commands which can also interface with logging and rig control software. The other USB port can be used for IQ output and also connects to your PC.

Table 1: IC-7610 Specifications

GENERAL		
Frequency coverage	Receiver*1	0.030–60.000 MHz*2
	Transmitter*1	0.1357–0.1378, 1.810–1.999, 3.500–3.800, 7.000–7.200, 10.100–10.150, 14.000–14.350, 18.068–18.168, 21.000–21.450, 24.890–24.990, 28.000–29.700, 50.000–52.000 MHz
*1 EUR version. Varies according to version. *2 Guaranteed range: 0.500–29.999, 50.000–54.000 MHz.		
Mode		USB, LSB, CW, RTTY, PSK31/63, AM, FM
Number of channels		101 (99 regular, 2 scan edges)
Antenna connectors		SO-239 × 2 (50 Ω unbalanced (Tuner off)) BNC × 1 (RX antenna In/Out)
Power supply requirement		13.8 V DC ±15%
Power consumption	Tx	23 A (at 100 W output power)
	Rx	3.0 A typical (Standby), 3.5 A (Maximum audio)
Operating temperature range		0 ˚C to +50 ˚C; 32 ˚F to 122 ˚F
Frequency stability		Less than ±0.5 ppm (0˚C to +50°C; 32°F to 122°F)
Frequency resolution		1 Hz (minimum)
Dimensions (W × H × D) (projections not included)		340 × 118 × 277 mm; 13.4 × 4.6 × 10.9 in
Weight (approximately)		8.5 kg; 18.7 lb
TRANSMITTER		
Output power (HF/50 MHz)		SSB/CW/FM/RTTY/PSK: 1–100 W, AM: 1–25 W
Modulation system	SSB	Digital P.S.N. modulation
	AM	Digital Low power modulation
	FM	Digital Reactance modulation
Spurious emissions	HF bands	Less than –50 dB
	50 MHz band	Less than –63 dB
Carrier suppression		More than 50 dB
Unwanted sideband		More than 50 dB
Microphone impedance		600 Ω

RECEIVER					
Receiver system		Direct Sampling Superheterodyne			
Intermediate frequency		12 kHz			
Sensitivity* (Filter shape: Soft)		0.5– 1.799 MHz	1.8– 29.999 MHz	28.0– 29.7 MHz	50 MHz band
SSB/CW (at 10 dB S/N)		–	0.16 µV typ.	–	0.13 µV typ.
AM (at 10 dB S/N)		6.3 µV typ.	2.0 µV typ.	–	1.0 µV typ.
FM (at 12 dB SINAD)		–	–	0.5 µV typ.	0.32 µV typ.
*3 HF: Preamp 1 ON, 50 MHz: Preamp 2 ON					
Sensitivity for RED*4 (Filter shape: Soft)		1.8– 2.999 MHz	3.0– 29.999 MHz	28.0– 29.7 MHz	50 MHz band
SSB (at 12 dB SINAD)		10 dBµV emf	0 dBµV emf	–	–6 dBµV emf
AM (at 12 dB SINAD)		16 dBµV emf	6 dBµV emf	–	0 dBµV emf
FM (at 12 dB SINAD)		–	–	0 dBµV emf	–6 dBµV emf
*4 Less than, HF: Preamp 1 ON, 50 MHz: Preamp 2 ON BW: SSB=2.4 kHz, AM=4 kHz, 60% modulation, FM=7 kHz, 60% modulation					
Selectivity (Filter shape: Sharp)		More than		Less than	
SSB (BW: 2.4 kHz)		2.4 kHz/–6 dB		3.6 kHz/–60 dB	
CW (BW: 500 Hz)		500 Hz/–6 dB		700 Hz/–60 dB	
RTTY (BW: 500 Hz)		500 Hz/–6 dB		700 Hz/–60 dB	
AM (BW: 6 kHz)		6.0 kHz/–6 dB		15 kHz/–60 dB	
FM (BW: 15 kHz)		12.0 kHz/–6 dB		20 kHz/–60 dB	
Spurious and image rejection	HF bands	More than 70 dB			
	50 MHz band	More than 70 dB (Except for ADC Aliasing)			
Audio output power		More than 2.0 W (at 10% distortion with an 8 Ω load, 1 kHz)			
TUNER					
Frequency range		1.9–50 MHz bands			
Matching impedance range		16.7 Ω–150 Ω unbalanced (less than 1: 3 VSWR)			
Tuning accuracy		Less than 1: 1.5 VSWR			
Tuning time		2–3 seconds (average) (Maximum 15 seconds)			
All stated specifications are subject to change without notice or obligation.					

Supplied accessories: (May differ depending on version)
• Hand microphone, HM-219 • DC power cable • Fuses • Plugs

Dual clocks are available and both independently settable so you can set one for Local time and the other for Zulu or UTC time.

Icom have enabled not just one but five timers… so there is no excuse for missing that early morning greyline schedule any more.

The USB ports are handy too as they allow you to plug in the RC-28 encoder, as this gives you the extra tuning knob if you need it for the second receiver. The RC28 can also plug into your laptop/PC for VFO and PTT function when using the RS-BA1 remote software.

The bottom line….should you get one?

Many have said that it's better to get two IC-7300s than an IC-7610 if you are just after the extra receiver.

With the IC-7300 currently selling at $1700, that's $3400 compared to an IC-7610 at $4600, OK so a saving of about $1200 BUT that's not a comparable solution and honestly just too oversimplified as the IC-7610 is just so much more than a couple of IC-7300s, in a larger box, in features, on air performance and in refinements. *(NB: The above figures are current street prices at the time of preparation of this review. Recommended Retail Prices are listed at the end of this article.)*

With the current street price of an IC-7610 at around $4550-$4600, this represents seriously good value for money given that Icom Australia also offer a five year warranty, provided that the unit's details are registered via the online warranty
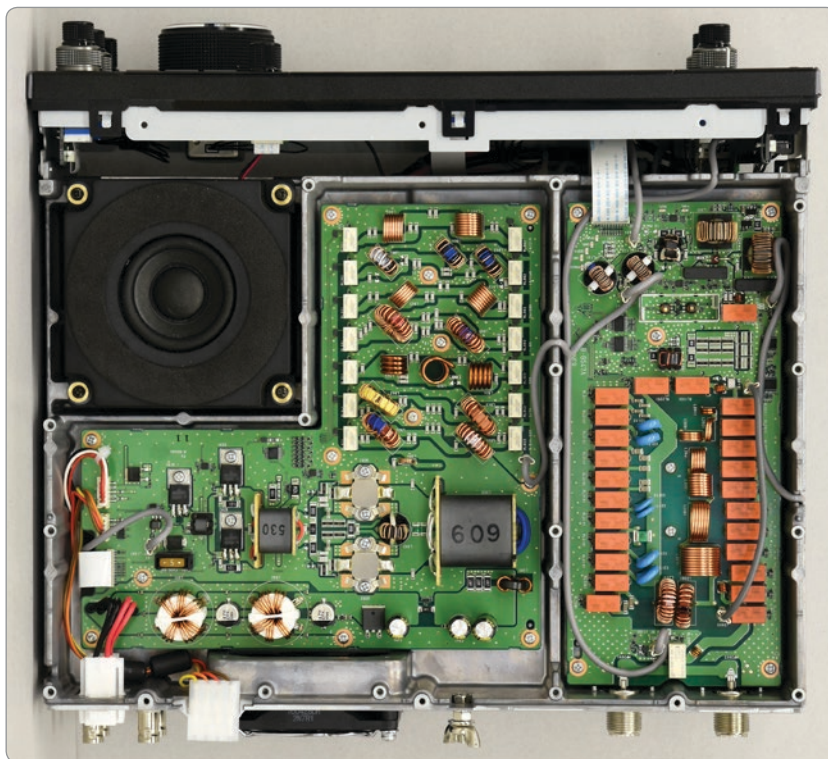

Photo 3: A view of the interior with the top cover of the IC-7610 removed.

registration portal or a warranty card mailed in to the Icom (Australia) office.

As technology advances and Icom update their transceiver offerings more and more of the "flagship" features are being offered into the lower models.

I currently operate an Icom IC-7300 and an IC-7851 which is my main operating rig. The IC-7610 really is leagues ahead of the 7300 but it is seriously up there with the IC-7851 for most applications. (If I didn't already have the IC-7851 I would have an IC-7610.)

If you are looking for a general upgrade or even a contest worthy rig with excellent noise reduction and filtering, with dual receivers, simple to operate and looks aesthetically pleasing to the eye, you really have to consider the IC-7610 to be at the top of your list of choices.

Thanks to Icom Australia for the loan of the IC-7610 for this review.

Current recommended retail prices

IC-7300: RRP - $2580.60
IC-7610: RRP - $7150.00
IC-7851: RRP - $22,440.00
Images courtesy of Icom.