

Review

The Icom IC-7200 HF and 6 m 100 watt transceiver

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The IC-7200 is a compact (241 x 84 x 281 mm – 5.5 kg in weight) HF and 6 metre, DSP, 100 watt (variable down to 2 watts) output transceiver on SSB, CW, AM (25 watts output only on AM), RTTY, FSK, and SSTV/PSK31, but with no FM facility. It is a triple conversion radio, the first IF is at 64.455 MHz, a second IF at 455 kHz and the third IF at 15.625 kHz where the DSP circuitry operates.

Although it is compact, it does not seem entirely suitable for mobile operation, even though a mobile mounting bracket (MB-118) is available as an optional extra. However, it is ideal for portable and field day operation, as well as for the compact home shack.

Although the IC-7200 is not water proof, the construction methods that are used in Icom's marine radios are applied to the buttons and knobs on the front panel to provide a measure of protection against water intrusion.

Even though the IC-7200 could be classed as an entry level transceiver, its advanced digital features are comparable with those in many higher class transceivers. For instance, it has IF DSP providing a wide choice of receive bandwidths, very effective digital twin pass-band tuning, a superb manual notch filter (up to 70 dB attenuation) as well as an automatic digital notch filter, excellent digital noise reduction in addition to a noise blanker, and an RF speech compressor.

As can be seen from the photo of the front panel, the IC-7200 has followed what seems to be the current fashion in amateur transceivers in having black knobs and buttons on a black background. Fortunately, the various controls are clearly lettered. Also, for such a small front panel, which also includes a speaker, the controls are a good size and well spaced. This is because there are

fewer front panel controls than would be normal for such a complex little rig, which is a result of most controls and buttons having multiple functions. More about that later.

The IC-7200 conveys the solidity of a military mobile radio set. We found the overall feel of the main tuning knob and other controls to be smooth and pleasant. The rugged construction of the case and the front panel, with the positive feel of the Neoprene push buttons, adds to this impression of a very solid rig.

The main tuning knob, with its chunky synthetic rubber grip, has a very smooth feel with no apparent side-play. The other rotary controls also have a positive and comfortable feel, particularly the large, concentric twin PBT (pass-band-tuning) knobs. The centre detent enables setting the twin PBT knobs to the neutral position.

This solidly constructed transceiver



Photo 1: A front panel view of the IC-7200 propped up on the supplied bail. The HM-36 hand microphone that comes with the radio gives an indication of the compact size of the transceiver.

has a rear bumper which protects the rear-panel connectors and heat-dissipator fins. Optional front handles (MB-116) will protect the front panel and its controls from accidental damage. A side carry handle (MB-117) is also available as an option.

Front panel and features

Although the IC-7200's monochrome (black on an amber background) LCD display is relatively small (64 x 24 mm), we found it sharp, and very legible, even to our aging eyes. Contrast was more than sufficient for comfortable viewing in bright light. The backlight settings are high, low and off. High, which is quite bright, is the default. Filter selections and feature activation are displayed via on-screen icons. Although some of these are rather small, we found them quite readable.

A very useful aid is the voice synthesizer, which is a standard feature. This function, at the push of the SPCH button alongside the On/Off button, announces the S-meter level, operating frequency and mode (the S-meter level announcement can be deactivated) in a very clear, electronically generated voice, in English. Only a quick push on the button is required. We found that if we pushed the button for any length of time it activated the controls Lock mode, and not the voice synthesizer.

A feature of the front is the inbuilt speaker. Although a small unit, the quality of received voice transmissions is surprisingly good. Obviously the frequency response of the speaker has been carefully optimised to the receive characteristics of the transceiver. Although the quality of AM broadcast station reception was quite good on this inbuilt speaker, quality can be improved by plugging in a larger external speaker.

As mentioned above, the main tuning knob has a very smooth action. Programmable tuning steps are available to suit your operating requirements. These are selectable from 0.1, 1, 5, 9 and 10 kHz tuning steps when rotating the tuning knob. When the 1 Hz step is selected, the 1 Hz digit appears in the frequency readout; when the 10 Hz step is selected, the 1 Hz digit disappears from the frequency indication. Turning the knob faster increases the tuning rate, which is a particular boon when using the 1 Hz tuning step rate.

The IC-7200 uses a high stability TXCO (+/- 0.5 ppm), and twin A and B VFOs are selectable with the A/B button. Multiple band-stacking for each band, a feature of other Icom radios, is not available. Single band-stacking is used, however, which means that each time you return to a band,



Photo 2: A view of the rear panel of the IC-7200 with the PSU cable plugged in. The connection to the external ATU is to the left of the power plug; the USBB connector is to the left of the Remote and External Speaker jacks.

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it will show the last frequency used on that band as well as the mode.

Most of the front-panel buttons have secondary functions which are accessed by pressing and holding the button for one second. The digit-entry function of the numerical buttons is a secondary function, and is entered by first pressing the F-INP key. The yellow numerical digits are a clue to this, as the F-INP marking is in yellow. The secondary BAND (band-selection) function of the F-INP key is marked in white, in keeping with the band markings on the numerical buttons. Obviously band selection is the tertiary function of these buttons. This may sound confusing, but the process becomes intuitive very quickly, although it takes a while to get used to pressing two buttons to change bands.

The IC-7200 has 201 memory channels, 1-199 for regular memory channels, and P1 and P2 for scan edge memory channels. Each regular memory channel shows a frequency and operating mode like a VFO. Even if the frequency or mode is changed, the memory channel does not memorise the new frequency or operating mode. When the memory channel is selected from another memory channel or VFO mode, the memorised frequency and operating mode appear even if the memory channel settings, frequency and mode, are changed before selecting another memory channel

or VFO mode. A memory channel's frequency and mode can be transferred to a VFO while in the memory mode.

The memory scan can be set to pause for 10 seconds when detecting a signal, and then resume the scan. When a signal disappears while the scan is paused, the scan resumes two seconds later.

The SET menu, familiar to other Icom DSP radio users, has two levels, accessible by pressing and holding the M-CH/RIT button. Press and hold once to enter the QUICK SET menu (transmit power output, MIC Gain, etc). Press and hold again to enter the in-depth SET menu. The MCH/RIT button is also an EXIT key. Similarly, M-CL restores a selected parameter to its default value.

The RIT function shifts the receive frequency up to ± 9.999 kHz in 1 Hz steps (10 Hz steps when the 1 Hz step readout is cancelled) without moving the transmit frequency.

At first, we found RIT activation confusing. To change the M-CH/RIT control to RIT, the RIT button must first be pressed to activate RIT. The M-CH/RIT knob will switch to RIT automatically when RIT is active (RIT icon displayed). When first pushed the shift frequency is indicated for about one second. Similarly, when changing the RIT frequency by turning the M-CH/RIT knob, the shift frequency is displayed. A few attempts to use the RIT function while

following the User Manual will unravel the complexities of RIT operation.

There is no doubt the RIT function is very useful and the initial confusing complexity of using this feature is a by-product of multi-function buttons.

The receive filter selection and adjustment procedure is similar to that of other Icom DSP radios. You press and hold the FILTER button for one second to adjust the filter bandwidth between Sharp and Soft. Quick presses of the FILTER button changes the filters to Wide, Middle or Narrow.

The filter bandwidths, which are continuously variable, are different for the various modes. On SSB the filter bandwidths are variable from 50 Hz up to 500 Hz in 50 Hz steps, then up to 3.6 kHz in 100 Hz steps. On AM they are variable from 200 Hz to 8 kHz in 200 Hz steps; and on RTTY they are variable from 50 Hz to 500 Hz in 50 Hz steps and then in 100 Hz steps up to 2.7 kHz.

The default settings for SSB are 3.6 kHz in Wide, 2.4 kHz in Middle and 1.8 kHz in Narrow.

Of course, the selectivity of the DSP filters can be enhanced by use of the twin Pass-Band-Tuning controls. The general PBT function electronically narrows the IF pass-band width by shifting the IF frequency slightly outside the IF filter pass-band to reject interference. The IC-7200 uses DSP for the PBT function. By rotating both TWIN PBT controls (inner/outer - PBT1 and PBT2) together, the PBT functions as an IF shift control. The limit of the variable range depends on the pass-band width and mode. The limit of the variable range is half of the pass-band width, and PBT is adjustable in 200 Hz (AM) or 50 Hz (other modes) steps.

The CW Pitch control is a QUICK SET menu item, rather than a separate control. The received CW audio pitch and monitored CW audio pitch can be adjusted to suit your preferences from 300 to 900 Hz in 10 Hz steps without changing the operating frequency.

Pressing the P.AMP/ATT button turns on the receiver preamplifier to improve the S/N ratio and sensitivity when receiving weak signals. Pressing and holding the P.AMP/ATT button for one second inserts a 20 dB attenuator in the RF signal path, in place of the preamplifier, to minimise very strong signals near the desired frequency from causing distortion of a received signal.

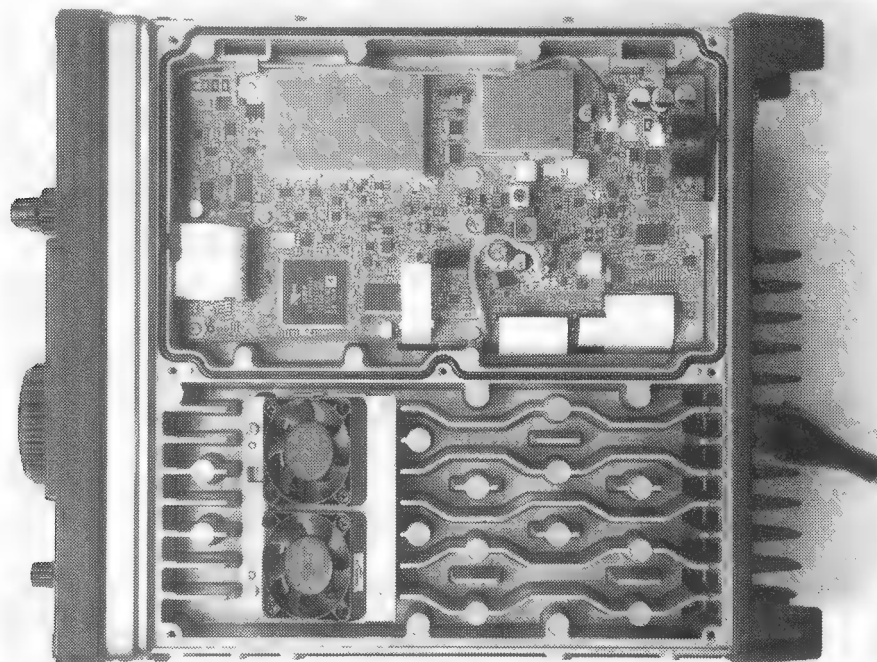


Photo 3: A view inside the top of the IC-7200 clearly showing the twin cooling fans and the extensive cooling fins and ducting.

The tuneable Manual Notch Filter is inside the AGC loop, and is extremely effective with a stop-band attenuation of at least 70 dB. The MNF has three width settings (Wide, Mid and Narrow). The manual notch suppresses an interfering carrier before it can stimulate AGC action, thus preventing swamping of the AGC by an adjacent notched signal.

The Automatic Notch Filter is post-AGC. It suppresses single and multiple tones, but strong undesired signals can still cause AGC action and swamp the receiver. The MNF and the ANF are mutually exclusive. The ANF is inoperative in the CW mode.

We found the DSP Noise Reduction function to work very well in a normal, noisy suburban location. On SSB the maximum noise reduction occurs at a level setting between 6 and 10 (maximum setting is level 15). As the noise reduction level is increased, there is some loss of highs in the received audio as well as a drop in audio level, as would be expected with digital noise reduction. Also, as the level is moved higher than about 6, the received audio seems to take on a hollow sound. However, in our use of the transceiver for normal SSB operation, the NR was switched in all the time.

We also found the DSP Noise Blanker to be somewhat more effective than the usual analogue noise blanker used in many other transceivers. It will strongly attenuate fast-rising noise pulses, but is less effective on power-line hash. The NB worked noticeably better when used in conjunction with the digital noise reduction.

Metering is provided by a bar graph in the bottom right hand corner of the digital display. In receive the bar graph acts as an S meter from S1 to S9 plus 20, 40 and 60 dB over S9. Three selectable transmit meter scales are provided – PO (RF output), ALC and SWR, but only one is in operation at a time. You hold the ANF/METER button for one second each time to toggle between the three transmit functions.

The IC-7200 has only two transmit audio menu items, Mic Gain and compression level. The DSP IF-level compressor is similar to that provided on other Icom DSP radios. It works very smoothly, and does not distort at the default compression level value of 5 (approximately 6 dB compression).

The US version of the IC-7200 operates

on the US 60 m band. We understand that, in order to ensure FCC compliance on 60 m, no transmit bandwidth or equalization menus are provided, even on the version of the IC-7200 being sold in Australia without 60 m capability. This lack of ability to vary the transmit audio characteristics is unfortunate. Using the standard Icom HM-36 hand microphone, the reviewers found the transmit audio to be quite bassy and lacking in high frequencies.

However, when not doing a comparison check of the IC-7200's transmit audio quality against another transceiver, it must be admitted that in many QSOs on-air other amateurs said that the IC-7200 audio was easy to copy.

We understand from other sources that substituting another microphone, such as the Heil GM-5 microphone, can change the transmit audio characteristics considerably for the better.

Incidentally, one of the features not included in the IC-7200 is a transmit audio monitor.

Back panel

The rear panel of the IC-7200 is uncluttered and provides many of the usual transceiver interfaces including connections to an Icom automatic antenna tuner, the Icom IC-PW1 1 kW solid-state linear amplifier, as well as relay and ALC connections for a non-Icom linear amplifier. Also included are connections to a CW key, an external speaker, the very solid DC lead, three metres long fitted with the now standard four-pin connector and two plug-in fuses and, of course, the antenna.

Another connection on the IC-7200 rear-panel is a USB port enabling the radio to be directly connected to a laptop or other PC via a standard USB cable. The USB port transports not only CI-V data, but also Tx and Rx PCM baseband between the IC-7200 and the computer. As a result, the USB cable is the only radio/PC connection required. For those interested in connecting their IC-7200 transceiver to their computer, for example to be able to view PSK31 and RTTY traffic and waterfalls, the Icom USB drivers are downloadable from the Icom Japan world-wide support site.

All back panel connections are indicated with raised lettering (see the photo of the rear panel).

On the air

It is a simple procedure to get the IC-7200 on-air; simply connect up a suitable antenna and PSU. The PSU requirements are 22 amps at 13.8 volts on full power transmit and only 1.3 amps on receive. The new standard four pin power connector is used, which the reviewers once again found very difficult to disconnect from the transceiver until we read the instruction manual!

As mentioned previously, changing bands is a little more complicated than on most transceivers. However, once the procedure is understood, it is quite straight forward.

The audio quality on receive from the small internal speaker is surprisingly good, very much better than we expected. One of the receive audio checks we make on reviewed rigs is to check audio quality on AM broadcast reception. Many transceivers reviewed in the past have been quite disappointing in this respect. However, AM reception on the IC-7200 was excellent, but intriguingly was better on the 6 kHz bandwidth reception than on the 8 kHz bandwidth reception.

Even though the audio from the inbuilt speaker was very good, nevertheless, as expected, the audio from a good quality external speaker was even better.

All in all, despite the small size of the transceiver, it was a delight to use once we became familiar with the multi-function controls.

We were favourably impressed by the IC-7200's solid construction (even though the appearance is metallic, the case is made from plastic). We were also impressed with the smooth operating feel of the transceiver, its impressive array of features and its good on-air performance. This is a lot of radio in a compact package.

We can thoroughly recommend the IC-7200 transceiver as a worthy addition to the comprehensive Icom range of transceivers. It is very good value for money.

The recommended retail price of the IC-7200 is around \$1,750, but may be available cheaper by shopping around.

A number of accessories are available, including external automatic ATUs, a carrying handle and front panel handles, etc. Consult your local Icom dealer for more details.

All photos by Bill Roper VK3BR.