Equipment Review

Icom IC-T8A Tri-Band Handheld Transceiver

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What Is It?

The IC-T8A is a tri-band (6 and 2 m, and 70 cm) handheld, offering up to five watts out (at 13.5 V, actually about two watts with the Ni-MH pack provided) in what Icom claim as the world's smallest full-featured tri-band package. The review set had a serial number of 01137 and was supplied courtesy of Icom (Australia). The retail price is around $700.

First Impressions

The first thing that can literally hit you in the eye with this set is the size of the antenna compared to the rest of the box. At some 227 mm this is over twice the height of the rest of the box at 107 mm. This can take quite a bit of getting used to and I found that, for the short time I had this set for review, wearing it on the belt was an invitation to getting the antenna caught up in all sorts of things.

In terms of the size of the base box, the IC-T8A is basically the same width, a little bit skinnier (depth), and a bit shorter (height) when compared to previous ICOM radios at 58, 28.5, and 107 mm respectively versus, say, the 57, 35, and 125 mm of the IC-2GXAT. The decrease in height is primarily gained by having the battery pack mounted on the back as in the common mobile phone case, rather than on the base as previously.

In summary then, apart from the antenna, the IC-T8A is about the same size as the majority of standard handhelds, with a number these days being quite a bit smaller. Icom's claim to its being the world's smallest full featured tri-band transceiver can only be taken as an indication of how many other tri-band handhelds there are out there, rather than an absolute indication of size. The photo shows the set in relation to a normal sized hand.

Construction

The IC-T8A is very solidly constructed with a diecast case and a statement that it meets Military Standard 810. This standard, as far as I can determine, is a US standard describing a series of tests defining everything down to and including the types and size of dust particles used in ingress tests.

Basically, this means that the set is not waterproof, but it is pretty much sealed (when all the little rubber seals and covers are in place) and wouldn't have any problems with the occasional exposure to water, sand, and vibration, etc that it might come across in the life of an active outdoors type ham. For the rest of us it probably just means we have less to worry about if we spill coffee on it, or drop it in the dirt.

In Operation

In operation, the set is simple and straight-forward to use and produces good quality audio of quite adequate volume for both broadcast and Ham use. I was particularly interested in its performance through the local six metre repeater (VK3RMH) where it worked well at quite reasonable distances.

The default repeater offset for six metres was not the required Australian 1 MHz, but it was relatively easily to set it to the correct local offset. This repeater (and six metre repeaters in general, as far as I can tell) tends to have quite low usage

and the advent of units like the IC-T8A should go some way towards redressing this situation.

The other thing that I noticed early on was that the image performance of the set is poor, especially in the broadcast band. Scanning the nominal broadcast range of 76-108 MHz, one could be forgiven for thinking that there were hundreds of broadcast stations, when in fact it's just the same ones repeated a number of times.

In practice this doesn't cause great problems if all you want is to listen to FM Broadcast music. But if, for example, you wanted the set to be a general receiver to use as an IF for a converter, or really did want to listen to something on, say, 76 MHz, all you will hear is the FM station at 102.6 MHz (roughly twice the IF frequency away).

The specifications (see sidebar) specifically exclude this second image frequency and it is easy to see why. At least by the in-built S meter, there is no difference in received signal strength between the fundamental and second image. The problem, while not quite so bad on the other bands, is still quite noticeable given signals at the appropriate points.

Technical Bits

Apart from the specifications in the sidebar, and the comments above on second image response, I had very little chance of commenting on the technical aspects of this set.

Firstly, as seems common now with the last few Icom handhelds I have reviewed, there is essentially no technical information in the 35 odd pages of the otherwise well-written manual; and secondly, I was only able to have the set for a relatively short period of time, thus limiting the chances of subjecting it to testing.

The manual does, however, explain clearly how to use all of the features of the set, much the same way as for a mobile phone, etc. I did notice, however, that there is no direct mention of what the receiver is capable of outside the amateur bands. The manual says that you will get wide-band FM for the frequencies 76-108 MHz, and AM for 118 to 136 MHz, yet the specifications as listed in the sidebar (and in the manual) would suggest that you only get the ham bands with a little bit each side.

In fact, on the radio tested, it seemed to be perfectly happy to accept frequencies anywhere from 50 to 800 MHz. Unfortunately, I did not have sufficient time to try and see what the performance was like over this entire range.

Another issue I have with the set is that there seems to be no way to change the receive mode from the default for a particular frequency. That is you can't get AM or wide-band FM anywhere other than on the dedicated bands; and conversely, if you want narrow FM in these bands, you can't get it.

IC-T8A Specifications at a Glance

General

Frequency coverage (Unit = MHz)

	6 metre	2 metre	440 MHz
USA	50 - 54	Tx: 144-148 Rx: 118-174*1	Tx: 440-450 Rx: 400-470*2
Europe	50 - 52 (Rx only)	144-146	430-440
Asia	50 - 54	Tx: 144-148 Rx: 118-174*1	430-440
Italy	50 - 52 (Rx only)	Tx: 144-148 Rx: 136-174*1	Tx: 430-440 Rx:400-470*3

*1 Guaranteed 144-148; *2 Guaranteed 440-450 *3 Guaranteed 430-440.

-Mode: FM, WFM (Rx only), AM (118-136, Rx only)
-Acceptable power supply: 4.5 to 16 V DC (negative ground)
-Number of memory channels: 123 plus 1 call for each band
-Operating temperature range (transceiver only): -10°C to +60°C (+14°F to +140°F)
-Operating temperature range (with Ni-MH battery): 0°C to +50°C (+32°F to +122°F)
-Frequency stability: ± 5 ppm (0°C to +50°C)
-Current drain (at 13.8 V DC):
-Tx: at 5 W: 1.4 A (typical) at 0.5 W: 0.6 A (typical)
-Rx: -max audio: 200 mA (typical) standby: 70 mA (typical) power saved: 30 mA typical/1:8)
-Antenna connector: SMA (50 Ohms)
-Dimensions (w/BP-198/199):
58 (W) x 107 (H) x 28.5 (D) mm (2.3 (W) x 4.2 (H) x 1.125 (D) in)
-Weight (with BP-199): 280 gm (9.9 oz)

Transmitter

-Output power (at 13.5 V DC): 5 W or 0.5W
-Modulation: variable reactance frequency modulation
-Maximum frequency deviation: ± 5.0 kHz
-Spurious emissions: Less than -60 dB
-External mic connector: 3-conductor, 2.5(d) mm (1/10") 2 k

Receiver

-Receive system: Double superheterodyne
-Intermediate frequencies (1st/2nd) MHz: 1st: 41.85 MHz, 13.35 MHz (WFM)
2nd: 450 kHz
-Sensitivity (at 12 dB SINAD): Less than 0.18 µV. Less than 1.99 µV (WFM)
-Squelch sensitivity (at threshold): Less than 0.18 µV. Less than 5.6 µV (WFM)
-Selectivity : Less than 15 kHz/-6 dB, more than 30 kHz/-60 dB (excluding WFM)
-Spurious response (except IF and 2nd image frequency):
50, 144 MHz bands: -60 dB (typical)
430/440 MHz bands: -50 dB (typical)
-50 dB for all bands at 1/2 IF image frequency
-Audio output power (at 13.8 V DC): 250 mW (typical with an 8 ohm load)
-External speaker connector: 3-conductor, 3.5(d) mm (1/8") 8 ohm

Table 1

Battery Pack	Voltage	Capacity	Output Power	Operating Time
BP-197	4.5 V	3 x Alkaline AA	0.8 W	9.1 Hrs
BP-198	4.8 V	700 mAHr	1.2 W	3.8 Hrs
BP-199	6.0 V	700 mAHr	2.0 W	3.5 Hrs
BP-200	9.6 V	680 mAHr	4.5 W	3.8 Hrs

Note the Operating Time is for a 1:1:8 Tx:Rx:Standby ratio.

There does seem to be an exception to this mentioned in the manual for the Europe and Italian version only; however, the review set did not have this option.

Operation

As has been said, the set was simple to operate and, with the on-screen help in the menu modes, it was very easy to add memories, change offsets, and scan, etc.

Setting a frequency was simply a matter of entering it on the keypad (including the decimal point) with the repeater offset being set by using one or more presses of the "Tone/Dup" button. In a slight variation from normal practice, the secondary function of the various buttons is achieved by simply holding them down for greater than a second rather than via use of a function key.

The basic transceiver functions worked well on 6 and 2 m and 70 cm, with both Tx and Rx audio at least on a par with any other handheld I have used.

As can be seen from the photo, the LCD display and keypad layout was good with no problems with viewing in sunlight, or needing tiny fingers.

The set offers the standard scanning options to scan from frequency to frequency, or through the 100 memories, and not much else in terms of value-added features. There are also some 20 other memories for call channel (per band), and scan limits, etc.

Compared to some other sets, Icom have chosen here to stick with the basics and have not added many of the frills sometimes offered.

The supplied battery pack was a Ni-MH unit which should perform quite a bit better than the more common Ni-Cd pack, and offers a much improved shelf life and greater energy density. A number of packs are available as options, including one taking three AA cells. The capacity, etc of these, as claimed in the manual, is shown in Table 1.

Conclusion

The IC-T8A is a rugged handheld which performs the basic functions well. The extended Rx coverage and, in particular, the FM Broadcast coverage, while not quite as good as some, is still very usable and makes an attractive package, especially if you want or need a six metre portable rig.

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