

11. *Australian Amateur Radio Call Book and AR Sep '94 (list of 2 m beacons).*

Parts List

	Qty
<u>Capacitors</u>	
10 pF trim cap	4
1000 pF or 820 pF monolithic	7
1000 pF feedthrough	1
0.1 μ F monolithic	3
<u>Resistors</u>	
10 ohm 1/8 W	1
270 ohm 1/8 W	1
100 k Ω 1/8 W	1
220 k Ω 1/8 W	1
<u>Semiconductors</u>	
BF981	1
NE602AN	1
78L05 +5 V chip	1
<u>Miscellaneous</u>	
40 MHz crystal module, FB101-43 bead, FT50-43 toroidal core, metal box, coax connectors to suit, double sided circuit board material for main board and scraps for paddyboards, #20 B&S wire, #22 B&S enamelled wire, hook-up wire, screws, nuts, solder, and enthusiasm (1 oz).	

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WIA News

Novice Privileges Revised

The five amateur radio Technical Licence Specifications (TLSS) originally gazetted on 2 June 1995 were gazetted again on 5 July. The TLSS gazetted earlier are now out of date. The only change apparent seems to have been to the Novice licence.

Novice licensees are now permitted to use digital modes on both the 80 m and 10 m bands.

Copies of all the TLSS are available free for the asking from your local Spectrum Management Agency Area Office. Novices are permitted eight additional modes on the 3.525-3.625 MHz and 28.1-28.6 MHz bands, which covers the popularly-used narrow-band radioteletype (RTTY) and packet radio transmission modes.

It is understood that these changes reflect the original intention of the SMA regarding Novice operating privileges.

Equipment Review

ICOM IC-Z1A Dual Band Handheld Transceiver

Reviewed by Paul McMahon VK3DIP*

What Is It?

The IC-Z1A is a dual band (2 m and 70 cm) handheld transceiver, with up to five watts of transmit output power on both bands, plus a wide coverage receiver with a nominal range of 50 MHz to 1 GHz. The unit is of mid size (57 x 36 x 125 mm) and has a solid feel (380 g). The review unit was kindly supplied by ICOM and had the serial number 01091. Recommended retail price is \$1131.17.

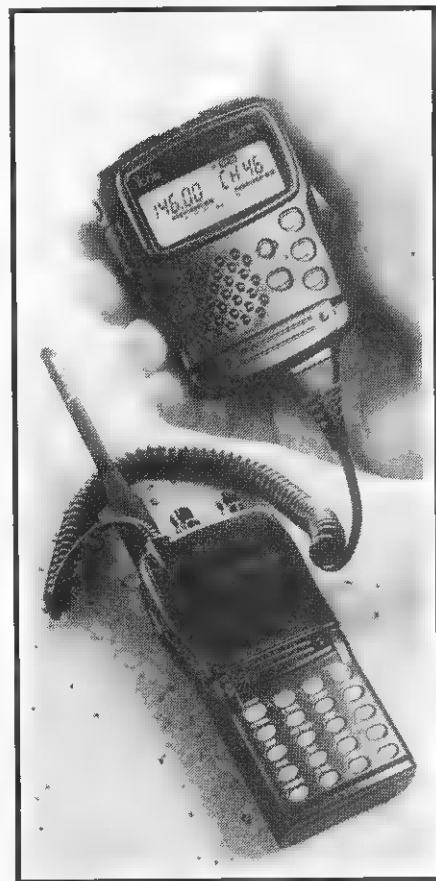
First Impressions

The first thing I noticed about this handheld was that it coincidentally had the same serial number as an IC-2GXAT which I reviewed last year. Perhaps ICOM always uses the 1091st handheld produced for reviews, perhaps all ICOM handhelds have the same serial number, or perhaps I should just buy a Tatts ticket.

Enough with the metaphysical, on with the review.

ICOM claims that this is the first of a new generation of handhelds in that it is the first dual-band handheld with a removable remote control panel. The idea is that the upper part of the front control panel, including the display, can be detached from the body of the radio. This remote control panel comes with an extension cable and lapel clip. It provides a full functional display (that is, the normal display) of all operations, including bands and frequencies, plus control of operating modes, volume, tuning, scanning, band selection, ON/OFF and PTT, but not the numeric keypad, or the squelch level. It can be backlit for night operation.

Basically the idea is the same as the removable front panel found on a number of mobile VHF/UHF boxes these days. I'm not too sure how well



the idea transfers to the handheld, however, so perhaps it will also be the last of its generation.

The problems here, I foresee, involve two main areas. Firstly, the contacts connecting the display and the rest of the handheld, despite ICOM obviously going to great lengths and, probably, expense to fit a spring loaded, gold plated, water resistant, connector. I still can't help but worry about the life of these contacts given the environments that people use handhelds in, and the repeated use as people swap backwards and forwards each time they need a speaker mic. Secondly,

in order to get everything that you would want on the detachable bit, several compromises have been made. The most annoying one I found was the placement of the PTT which, when not detached, is on the side of the handheld as usual but placed towards the front, rather than being in the middle. This has the effect of making the handheld feel fat and could lead to people with shorter fingers having some difficulty in using it.

Forgetting the detachable panel for the moment, the unit comes in standard foam packaging, complete with rubber-ducky antenna, panel extension cord, charger, and 700 mAh nicad pack. It also includes an instruction manual, and quick reference card.

Apart from the compromises on the detachable panel, the remaining ergonomics of the radio are reasonably good. Each band has a separate concentric tuning/squelch knob set, and display section, with its own LCD S-meter. Simultaneous receive on both bands, or full duplex (Tx on one band while Rx on the other) is possible. Also offered is the so called V/V and U/U ability, where it is possible to have the two bands both on VHF or both on UHF. This can be very useful if you have, say, two 2 m repeaters that you wish to monitor simultaneously.

The top of the set has the standard BNC connector for the antenna, as well as the normal ICOM speaker/mic connector and a power-cum-charging socket.

The 60 page instruction manual has, as is unfortunately usual these days, little in the way of technical detail. This manual, while explaining how to do most of the things that this radio can do, does not mention a number of the extras that are possible. For instance, the US press release mentions a standard VHF Rx range of 136-174 MHz which is keyboard modifiable for 118-136 AM. There is no mention of how to do this in the manual nor, for that matter, was I able to find it by trial and error.

I did, however, work out what one extra feature in the SET menus did. This item was labelled PLCE and, as I discovered, controlled frequency entry via the keyboard. In default

mode the first digit pressed was the MHz (eg 6675 on VHF gave 146.675 MHz). By changing the place variable in SET you could have five or six digits as the entry string. This is especially necessary when using the wide range Rx capabilities of the set. Any other way of moving around just takes too long. There was no mention of this place variable in the manual. Perhaps the manual was written before the actual radio was finished.

Technical Bits

Despite what the manual says, the Rx frequency coverage of this radio seems to be basically 50-1000 MHz (VHF 50-300, UHF 300-999 MHz), though not at all well at many points in the spectrum. The Tx does seem to be as advertised at 144-148 and 430-440 MHz. More on this later. No circuit diagram was provided so, as usual, any real technical details are restricted to what small amount is in the manual and things that I could manage to measure from the outside.

As far as the bits from the manual are concerned, we find that it has a dual conversion superhet with a 43.1 MHz and 35.8 MHz first IF on VHF and UHF respectively, with both bands using a 455 kHz second IF. Sensitivity for 12 dB SINAD is claimed as less than 0.16 μ V except when using the V/V or U/U feature, when less than 0.32 μ V is stated (that is when using both halves of the set on the same band).

The tests detailed later confirm this as the case, at least in the relevant ham bands. Selectivity is on a par with other similar boxes, as is spurious and image rejection. While only claiming more than 180 mW audio output, I must admit to the subjective feeling that it was producing much more with very clear and clean sounding audio. For the Tx the rated power outputs were 5, and 0.5 Watt, with 15 mW (all when driven from 13.5 V) also selectable. This low, low power could also be automatically selected when low battery voltage was detected.

As far as memories and extras are concerned, this set has a total of 104 user programmable memories, each with the neat feature of a six character alpha-numeric display. Typically this could be used to store

the callsign of the repeater or, perhaps, some other note to remind you of what it is.

The memories are arranged as 46 regular and three pairs of scan edge memories per band. The six character display can also be used in conjunction with the paging and selective call functions to transmit and receive text messages such as the callsign of the calling party. Ten receive and ten transmit memories are available for this purpose so that, given a matching handheld at the other end, you could come back after being away from your handheld and see who had called you. I personally feel that this sort of feature is nice but perhaps more suited to a more "commercial" version rather than an Amateur Service one.

All the usual scan features are present, as are the pager and code squelch functions, but it should be noted that they only work on one band at a time, and they do limit the effectiveness of the receiver duty cycle power saver modes. Speaking of the power saving, the supplied

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3 ele 20 M	\$333
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M B Vert NO TRAPS 10-80 M	\$265
Tri band beam HB 35 C 5 ele	\$690
40 M linear loaded 2 ele	\$516
13-30 M logperiodic 12 ele	
all stainless/steel fittings	\$951
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23 cm slot fed 36 ele brass cons	
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nicad pack is a 700 mAh 4.8 V unit which is claimed to provide some five hours and 50 minutes of use when using VHF only (in a 1:1:8 Rx:Tx:Power Saver type ratio) and some four hours and 20 minutes in similar conditions with UHF. The supplied charger will supposedly charge the nicads in some 15 hours, and you can expect some 300 recharges out of the battery pack. A one hour fast charger is available as an option; however, this may reduce the life of the pack.

I would probably invest in the optional dry cell pack, and just use the slow charger. This brings us to the display and its ability to tell you the voltage of the pack. This is a very useful feature, although the manual notes "the battery indication is only for your reference and may not be accurate".

waiting for a call. You do, however, need to be a bit careful here as receive sensitivity on both channels will be affected, the secondary by about 6 dB and the primary by about 2 dB as, shown in my tests.

Tests

The results noted below are more or less limited to the VHF side of the set, more because of the available test equipment rather than anything else. I feel, however, that, based on "on-air" performance, they are probably representative of the UHF band as well.

The LCD S-meter had a strange quirk. While it is probably the most linear (or should that be logarithmic?) I have ever come across, it did have the strange effect that, when opening the squelch on an unoccupied frequency, the reading increased

band and perhaps around 120 MHz. This also was born out in "on-air" tests with broadcast FM stations only just being there, local CFA traffic on 160 MHz being unusable, and no sign of a nearby 6 m repeater. Similarly, on UHF, while mobile phone signals were detectable, you had to be in a pretty ideal location to have reliable reception. Within the 2 m and 70 cm ham bands though, the unit was everything you could ask for. Perhaps the manual was correct after all in not mentioning the possibility of out of band receive.

Operation

In general operation the set was pretty much as you would expect from ICOM. The audio quality was particularly good, and frequency setting, etc, once you had the hang of it, pretty straight forward. There are some problems with the ergonomics due to the detachable front panel as mentioned before, but on the whole it is a quite useable box.

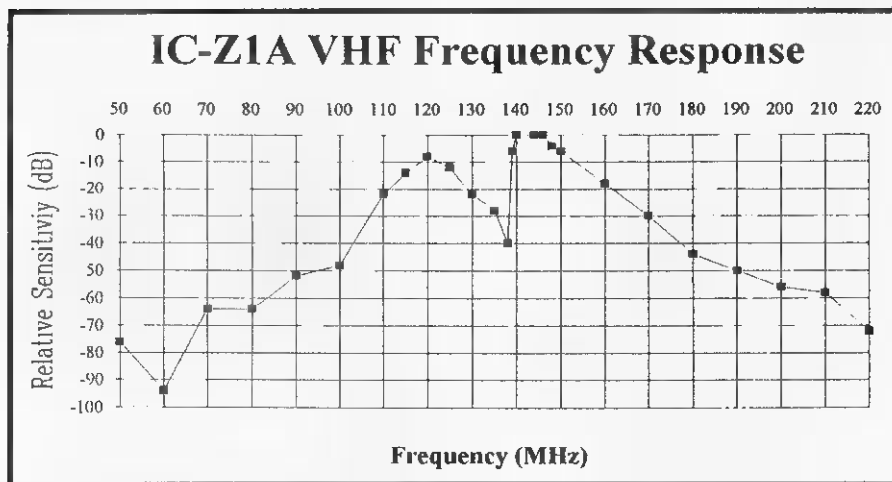
One thing that disappointed me was the manual which, even with the 60 odd pages, didn't satisfy my requirements for something I may have just paid over \$1000 for. In particular, there were things that the radio could obviously do which were just not mentioned. ICOM is not, of course, alone in this. It seems to be the industry norm these days.

I believe that there is a really good opportunity for some ham to enjoy their hobby and to make money too, by filling this void. It's now done as a matter of course with every new piece of software that is produced. Several people test it out and write the book, which invariably is better than the supplied manual.

Conclusion

I didn't like the detachable panel idea though, perhaps for some, it will be just what they wanted. Likewise, I don't think it is really a wide band receiver. I also think that the pricing of this box is a little steep, considering that the US RRP is \$US600 (approx \$AUS830) and that dual-band handhelds with similar or better features are currently on sale from at least one local vendor at \$AUS699.

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IC-Z1A VHF frequency response.

The set can operate in so called V/V and U/U mode as well as normal dual band. This can be useful when you want to listen to one conversation while monitoring another frequency

from none to one little square! The display has eleven of these little squares with each one being close enough to a one dB increase in signal level. How these effects are achieved will have to stay a mystery as no circuit details are provided.

The VHF receiver performance is shown in the accompanying graph.

For these tests the set was configured for monoband operation. A test at 146 MHz confirmed that the V/V option second 2 m frequency is 6 dB down on the prime; also in this mode the prime is 2 dB down on normal operation.

As can be seen, the receiver is really only useable in the amateur

Don't buy stolen equipment — check the serial number against the WIA Stolen Equipment Register first.