

## ■ Equipment Review

# ICOM IC-738 All Mode HF Transceiver

Reviewed by Ron Fisher VK3OM\*

As the saying goes, "when you're on a good thing, stick to it". At the same time, however, a few updates and improvements will never go astray. First, there was the IC-737 which I reviewed in the August 1993 issue of *Amateur Radio*. Then, with a few slight changes, the IC-737A. Now, with even more improvements, the IC-738.

Let's look at the first two quickly and then the new IC-738 in detail. Of course in between all of these, ICOM brought out the IC-736 which I reviewed in the July 1994 issue of our magazine. All four transceivers are closely related and from a distance would be impossible to pick apart.

Back to the beginning. The IC-737 was a high performance rig which lacked a few desirable features such as VOX, RF gain control and adequate metering. The IC-737A partially overcame this by adding VOX. The IC-736 included an RF gain control, better metering and, of course, six metre coverage as well as a built in AC power supply. It also introduced a one Hz tuning rate and display. There was no provision to operate the transceiver from a 12 volt

DC supply so the IC-736 is a dedicated base station only. Enter the IC-738 with all of the operating features of the IC-736, less six metres and the AC power supply.

The IC-738 is 12 volt powered so it is suitable for mobile or portable operation. For home station use you will need an external 13.8 volt power supply such as the PS-15, PS-30 or the PS-55, all of which are available from your ICOM distributor.

### Features and Facilities

In order to save you referring to my two earlier reviews, I will run through the main features of the new IC-738. For a mobile transceiver it is fairly large. It is a bit difficult to relate this to ICOM's latest advertisements that claim "ICOM radios are getting sleeker and slimmer". It looks as if Duncan has lost a kilo or two but I am not so sure about the IC-738!

The overall dimensions are 111 mm high, 330 mm wide and 285 mm deep. Overall weight is 8.6 kg. One of the highlights of the series is the large LCD readout. Illuminated in bright orange with black numerals, the intensity can be adjusted by an

internal preset control. Following on from the earlier models, the "S" meter is rather dull. The transmitter covers all amateur bands from 160 to 10 metres while the receiver has full coverage from 30 kHz to 30 MHz. Operating modes for both transmit and receive are SSB, CW, AM and FM. The transceiver comes with three filters, a 2.1 kHz for SSB and CW, a 6 kHz for AM and a 12 kHz for FM.

Narrow CW filters are available as options. The one Hz tuning rate and readout introduced on the IC-736 is there in the IC-738. Front panel layout is unchanged from the IC-736 and the number and location of controls are the same as the original IC-737. However, the compression level control has been shifted to the rear panel to make way for the RF gain control and the "tune" button is now the meter switch. Meter functions are: "S" meter on receive and ALC, RF power output and SWR on transmit. These are selected sequentially with each push on the meter button, with the LCD indicating the mode selected. One important difference between the IC-738 and the IC-736 is that the final RF amplifier on the 738 is powered from the 13.8 volt line whereas the 736, with the benefit of an AC power supply, allows its final to run from a 40 volt line. However, as we shall see later, the intermodulation distortion performance of the IC-738 is very good none-the-less.

### On The Air

I found it virtually impossible to pick any differences between the 738 and the 736. Again, an ICOM HM-36 hand microphone was supplied and, for the tests, I also used an SM-6 desk microphone. Transmitted audio was again rated as thin and slightly harsh. The speech processor was effective in adding a degree of punch to the signal. A generous 100 watts was obtained on all bands and intermod distortion was found to be better than -30 dB, an excellent result for a 13.8 volt powered transceiver. Overall, the receiver performed very smoothly except for the rather muffled audio response. The AM performance, in particular, sounded very woolly.

There was almost no difference in audio quality between SSB reception of an AM signal and the actual AM mode. I measured -15 dB at 3 kHz on



ICOM IC-738.

the IC-736 and it sounded just as bad on the IC-738. My guess is that the receiver audio amplifier has a sharp cut off above about 2 kHz and this affects all modes. There might well be a simple modification to overcome the problem. No doubt time will tell.

All of the great operating features of the IC-736 are retained with such things as the double band stacking register, the memo pads for quick entry of temporary memories and, of course, the one hundred and one normal memories all of which are fully tunable. Also the front panel key pad allows direct frequency input.

### On Test

It soon became obvious that the overall performance of the IC-738 was identical to the IC-736 in almost all parameters except, of course, that the IC-738 does not operate on six metres. To save referring to the earlier IC-736 review, I will run through a few of the more important test results. Transmitter power output in the CW mode was in the range of 124 watts

on 160 metres to 107 watts on 10 metres. It is possible to reduce the power output down to about five watts with the "RF PWR" control. This control operates on all modes. Transmit intermodulation distortion was estimated to be just in excess of -30 dB as referred to normal SSB speech output which is very good for a 12 volt powered transceiver.

On the receive side, the sensitivity in SSB mode at 14.2 MHz was 0.14  $\mu$ v for 10 dB SINAD. The "S" meter indicated S9 with an input of 20  $\mu$ v measured with the "Preamp" switched in. Sensitivity and "S" meter indication was even across the bands. Once again I was not impressed with the quality of AM signals so I repeated the tests I carried out on the IC-736. The results were much the same. The -6 dB points were at 250 Hz and 2.2 kHz with the response down -16 dB at 100 Hz and 3 kHz.

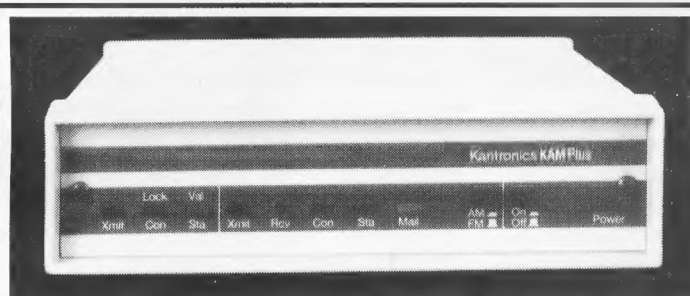
The notch filter produced a notch depth of -28 dB, however, I thought that the notch width was a bit too wide

at the top giving a rather hollow sound to the audio. Audio power output is excellent with more than the specified 2.6 watts being produced at less than 10% distortion and the product detector distortion still an amazing 0.3%. Stability tests came up with an even better result than I found in the IC-736, with total drift of less than 15 Hz over an extended operating period. Again I would very much like to try an IC-738 with the optional high stability master oscillator installed. Over all, an excellent result.

The IC-738 is one of the best performing transceivers on the market at the moment. Pity about the transmitted and received audio quality.

### IC-738 Instruction manual

The instruction manual for the IC-738 also doubles for the IC-736. Well, why not. After all, the operation is exactly the same in 95% of their functions. The format of the book is very much the same with excellent



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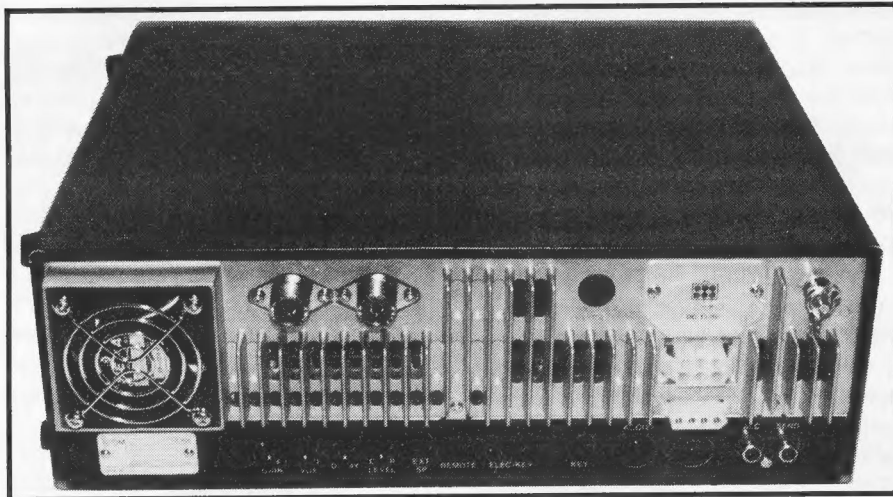
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Rear panel of the IC-728.

line drawings to describe operation. Photographs detail several adjustment points that could come in handy in the future. Again there is no technical description of how the IC-738 works. On the basis that the manual now covers two different models, I am going to drop my score rating one point to seven out of ten.

### IC-738 Conclusions

There is no doubt that ICOM have responded to a demand for increased operating facilities with the IC-738. However, I have to ask a few questions. Why weren't they included in the original IC-737, as I asked in my original review? So, having gone this

far, why not a bit further? The biggest surprise is that an inbuilt AC power supply is not offered as an option. There is certainly room for it, and one fits very well into the IC-736. My other wish is that the positions of the RF gain and the squelch controls should be changed over, with the RF gain concentric with the AF gain and the squelch positioned as the minor control. Then, with a meter position for measuring compression, the IC-738 (or will it be the IC-739?) would rival the top-of-the-line transceivers on the market at the moment.

The IC-738 is priced at \$2901.20 which is nearly \$300 up on the price of the original IC-737. Of course, the IC-738 replaces both the IC-737 and 737A and these are no longer available.

Thanks to Duncan Baxter for the loan of our review IC-738 transceiver. For further information on availability of the IC-738, give Duncan a ring at ICOM on (008) 338 915.

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## WIA News

### Packet Radio Users and the Law

Since a telephone computer bulletin board user in West Australia copped a \$40,000 judgement in a defamation action earlier this year (see *WIA News*, May issue), there has been protracted debate among the radio amateur community about the liabilities of packet radio use.

Under the current radiocommunications regulations governing the amateur service, any packet radio station forwarding messages is responsible for their content. Add to this the situation under defamation law that any station operator transmitting or forwarding a message originating from another station having defamatory content is a "knowing publisher", even though their station automatically forwards messages. The originator and all forwarding stations are liable under defamation law.

The problem is, a practice has allegedly arisen in which packet operators use the callsigns of other stations to transmit messages which are possibly defamatory or otherwise in breach of the amateur regulations. Suggestions have been circulated that the "problem" could be readily circumvented by using software which provides for packet message "authentication" by users. Such authentication software employs encrypted character strings embedded in the packet message, but there has been concern that the use of this type of software may also transgress the amateur regulations.

A spokesman for the SMA has advised, in responses to individuals, that the existing and foreshadowed amateur regulations allow the use of such encrypted strings for authenticating packet messages. The SMA spokesman

has also indicated the Agency would be reluctant to legislate that authentication be mandatory, or to specify a particular system. Reduced regulation, wherever possible, is the aim.

To be on the safe side, packet BBS operators should store and view messages to confirm that the contents are not libellous or in breach of amateur regulations. Even with authentication, the SMA spokesman points out, Section 108(d) of the Radiocommunications Act 1992 places the onus on all licenses, including packet BBS operators, not to permit their stations to be used to affront, alarm or harass other people.

In the USA, the FCC places the onus on the originator and first PBBS station to keep the content of messages within the law. In Australia, it is every operator's responsibility.