Product Review

ICOM IC-910H VHF/UHF Multimode Transceiver

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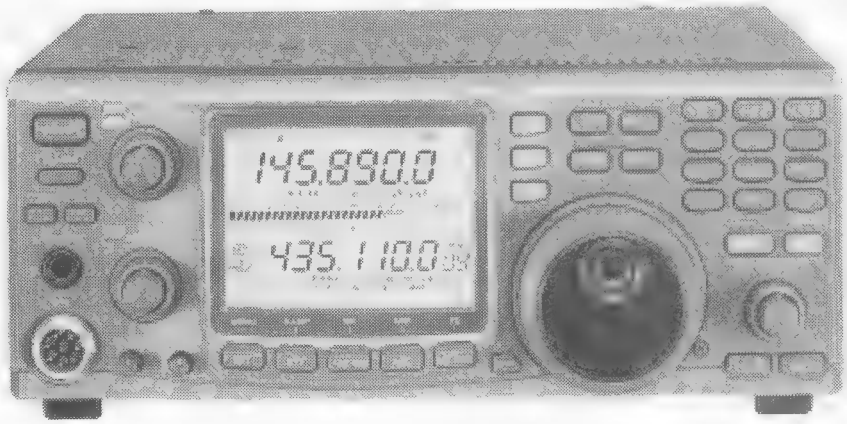

I have been asked by many Amateurs during on and off air discussions, of my impressions and findings of this multimode VHF/UHF dedicated transceiver. As a result I have put together this, my warts and all, appraisal of the radio.

I have had mine for almost 12 months and in that time I have been able to assess the unit's performance and facilities without being constrained by a time scale. The radio, during this time, has not suffered a single failure.

My unit has been optioned for 23cms (UX-910) and the high stability crystal unit (CR-293) as well as the Digital Signal Processing (DSP) UT-106. These options were especially relevant to my particular fields of interest.

Icom has produced many dedicated VHF and UHF radios (many of which I have either owned or "played with") and this latest model provides top of the line performance commensurate with a multi functional radio. I would not go as far as to say the unit provides the best single band performance of all the previous radios, for it certainly does not, but as a compromise its performance and facilities are, in my view, un rivalled.

After unpacking the unit and hooking it up on the test bench (it requires an external 13.8v 25A supply) my first aim was to check the receiver sensitivity and power out put on all bands and modes. I need not have bothered as all exceeded the specifications listed in the handbook, however it does give you a "feel" for the radio's performance and confirms the manufacturer's quality control. Incidentally, the carrier suppression was found to be far in excess of that specified.

The tests took a lot longer than I care to admit. I had seemingly lost my ability to guess the latest "Icom way of multi functional button usage". All clearly explained in the manual mind you, but to front the box and drive it straight off left me struggling a tad.

My immediate reaction to all the facilities, functions, and variables was to question why would you need all these (to me) sophisticated inclusions.

The facilities are just amazing. Probably 60% you will never use, but given everybody's differing interests it will not be the same 60%. Whatever your interest or specific requirement you may have in VHF/UHF, you would be hard pressed not to find just what you require in this radio. I also could not help thinking of the problems a non-technical licensee would face understanding the terms, as well as the implications they would face setting up a modern day radio!

Fundamentally the selectable modes available are SSB (USB/LSB), CW (2.3 kHz), CW-N (500Hz), FM and in VK covers 144-148, 430-450, and 1240-1300 MHz (additional optional)

The IC-910H has two VFOs for each of the standard 2 metre and 70cm bands and each recalls the mode of operation. All provide selectable quick tuning in 1kHz or 1MHz steps. Also you may select the tuning steps from 1Hz (SSB/CW) to 100kHz (FM). Frequency entry can also be made from the front panel keypad.

Receiver functions provide a multitude of options. Most are multifunctional and can be can be set independently for each band or memory function. This is where I found the instruction manual essential as many functions, not initially apparent, were revealed! Here are some of the facilities available. Dual frequency watch, all mode squelch, receive incremental tuning (RIT), Intermediate Frequency (IF) Shift, Automatic Gain Control (AGC) time constant selection, Automatic Frequency Control (AFC for FM only), FM centre indicator, rudimentary (but very useful) band scope with adjustable sweep time interval, selectable attenuator, noise blanker (quite effective on rain static and pulse ignition noise), tone squelch frequency selection, Automatic Notch filter (ANF), Noise Reduction (NR) from the optional DSP unit, auto and manual setting of repeater operations, including tone gated squelch, full all facilities programmable scan function, including a most useful Tone scan facility. Another major feature is the Satellite Operation modes. That in itself could would require many paragraphs to explain. Additionally there are 212 memory channels available. (99 regular, 6 scan edges, plus 10 satellite memories.

Importantly, data communication is well catered for by the provision of rear panel data and accessory sockets. The IC-910H does not provide a Frequency Shift Keying (FSK) option but relies on using Audio Frequency Shift Keying (AFSK). It is stated it is capable of speeds up to 9600 bps.

Transmit wise the power output is a genuine 100 watts on 144, 75 watt on 70cms and 10 watts on 23cms on all modes. The level is infinitely variable

as mentioned above too. The 'on temperature demand' fan is fairly quiet and does not run all the time on receive as some other radios do. Note. 23 cm is not standard but is added as an option. (UX-910).

This radio adjusts power output on CW (or any other mode for that matter) without the spiked wave front many similar transceivers exhibit. (Yes this box has had 90% of its hundreds of contacts on CW!). It also has an in built keyer (no character store facility) semi break-in. with adjustable weighting, delay, pitch, and side tone level. In SSB and FM fully adjustable Voice operated Transmission (VOX) is included. Speech compression is also provided and from off air reports provides an advantage without noticeable distortion. Like most rigs, careful operator adjustment is essential to produce a clean on air signal.

But that's not all !...

The IC-910H can also be remotely controlled from a back panel socket via an RS-232C port. (It will require an optional CT-17 level converter). All the required commands are documented with in the instruction manual for those with a programming flare and nothing much to do on a cold winter's evening.

For the serious-minded, the radio provides, via the accessory output connector, internally programmable switching facilities for both remote transmit amplifiers and receive pre-amplifiers on all 3 bands. (Where fitted). This is a unique advantage for the multiband multi amplifier operator who wishes such switching. Unfortunately, for the "specialist user " who would like separate (rear panel) accessibly receiver inputs, this transceiver does not go quite that far! Hopefully Icom may address this in the future.

Here are some of my specific findings that may interest you gained from operating this radio over the past 12 months.

Receiver noise figure. I have measured all bands by Y factor substitution (corrected Sun Noise) and they equate to: 144MHz < 1.3 dB, 432MHz <1.6 and 1296MHz < 1.8. Not outstanding but well inside what could be expected for modern multiband transceivers. For really serious weak signal work Low Noise Preamplifiers are always must. Receiver sensitivity was measured and was found to be better than stated in the specifications.

The ability to monitor simultaneously two bands at the same time is a very useful and practical feature. A big tick!

The overall end to end gain and frequency stability is excellent. This may not appear important, but for me this characteristic is essential when measuring astronomical noise sources and delving for extremely low level Doppler offset signals. Although not a precision measuring instrument by a long chalk, it does however provide a most ample crosscheck for my purposes. Frequency resolution at ± 0.5 ppm is quite adequate even at 23cms. Note this an additional option. (CR-293). These properties will be of considerable benefit for those venturing in the new digital modes. (Eg JT44 and FSK441).

Large signal handling is better than most radios in its class. Similarly I also found the transmitted spectral quality adequate. Subjectively speaking, with our comparative low activity on the bands, you will not cause any excessive problems to your locals nor will they trouble you. If you happen to live close to a VHF pager transmitter you are unlikely to suffer the cross mode and overload problems many of today's rigs exhibit. If operating in a multi transmitter field day situation then the side band noise could require greater physical (space and or frequency) separation. The bottom line is that the IC-910H performs very well indeed compared with many other similar radios on the market and considerably better than the multi mode multi "all" band transceivers.

The bottom-line: A brilliantly performed Radio with most of the features you could ever desire!

RIT. For EME (and some Satellite applications) operators the range is not adequate. ± 1.0 kHz on 144 and 432 MHz (SSB/CW) or ± 2.0 kHz for 1296 MHz will not provide for the Doppler Shift found under certain circumstances. This is only a minor inconvenience as you can always use the dual VFOs.

Another minor facility lacking (that would be nice) is that it cannot select an alternate frequency display to show the actual and not the intermediate frequency. This would be useful for those that use this rig as an IF for transverters.

Noise blanker. Quite adequate but not fantastic. It handles most impulse noise and to some extent rain static. I am "picky" when it comes to noise blankers and this one, on my scale, rates 5 out of 10. It would also be nice to turn off the AGC.

The Auto Notch filter. Every rig should have one! Works a treat. I would wager most on VHF/UHF don't have CW QRM nor require its use but it's there for your birdies and it is very effective. The IF Shift is also most useful and very effective.

I have left the *DSP option* and its effectiveness to last. From the onset I should declare that my XYL claims I have always had selective hearing and only the sound of food gets through the built in filter. Seriously though, my ability to copy CW off the Moon in the noise (and even slightly below) has well "developed" over many years of practice. Along with this, my upper frequency response has fallen dramatically with time. My HI FI is any thing flat to 1kHz!! (Sounds familiar?). Anyway this is what I have found when using the DSP FFT filters. Others may find totally differing results. I believe a lot of the final effectiveness "can you read a signal better with DSP"? Can depend upon your own situation? Don't get me wrong, I too can mathematically prove to you that an improvement of x dB will be achieved with a FFT of x! The bottom line to all this with the DSP in the IC-910 (and a IC-756 for that matter) was a significant improved readability in cases of very marginal SSB signals where without DSP I could not copy the SSB signal but with it I was able. (I.e. a Q1 was improved to a readability Q3/4). However on CW my old ears seemed its equivalent!!?? Without doubt it is a most worthwhile feature and under weak signal SSB situations in particular the gain in readability can be dramatic. I have played with it considerably listening to my SSB signals off the Moon listening to the fascinating effects of libration fading taking place in such narrow bandwidths ... but that's another story!

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