

The Icom ID-31A 70 cm handheld transceiver

Peter Freeman VK3PF, with Michael Carey VK5ZEA

Earlier this year, Icom Australia released a new 70 cm handheld transceiver – the ID-31A. As one might expect from the deviation from the usual model identification prefix (ID instead of the usual IC), the new radio includes digital capability in the form of D-STAR built into the transceiver as standard.

In early February, I received an email from Icom which included a press release on the ID-31A together with an offer of the loan of a unit with the view to preparing a review. Naturally, I had to accept. The package arrived a day or two later.

The ID-31A is a five watt 70 cm FM transceiver complete with the D-STAR coder/decoder and GPS. Readers may recall a review of the IC-92AD dual band handheld some time ago: with the IC-92AD, the D-STAR board was an optional extra, as was the handheld microphone which had a built in GPS receiver.

On opening the box, one could note the usual style of packing of a typical handheld transceiver: the main body of the radio, the battery pack, the antenna, a belt clip and a wrist strap, an operating manual, a battery charger and a warranty card. In addition, the ID-31A package included a 'D-STAR Quick Guide', a CD and an envelope marked 'Introductory Offer' which contained a two GB MicroSD memory card. The CD includes an electronic copy of the Instruction Manual, the D-STAR Quick Guide, the Icom booklet 'Ham radio terms', an 'Advanced Instructions' manual and a copy of the CS-31 cloning software with a digital manual for the software.

The transceiver was quickly assembled without the need to refer to the Instruction Manual and was soon in operation on the local 70 cm FM repeater and on simplex. Personally, I found basic operation of the unit extremely simple and intuitive.

It should be noted that we do not have a D-STAR repeater in the Latrobe Valley. As a result, I (VK3PF) shall describe the general features of the transceiver. During discussions with others during the review period, I became aware that Michael VK5ZEA was making good use of an ID-31A on the D-STAR network from Port Lincoln. I dropped an email to Michael and asked him to prepare some comments about the unit with respect to D-STAR usage. His comments will follow mine.

Transceiver features

The ID-31A is a true palm-sized handheld transceiver. Its dimensions are 58 (W)×95 (H)×25.4 (D) mm (not including projections), with a mass of only 225 grams (140 grams without battery pack). According to the Instruction Manual, the key features include:

- 'Built-in GPS receiver
- GPS Logger function allows you to check your route as you move
- MicroSD card slot ready for memory storage
- Voice recorder to record your communication
- Waterproof construction (IPX7 - Only when the BP-271 or BP-272 battery pack, antenna and jack cover are attached.)
- DV mode (Digital voice + Low-speed data communication) operation-ready
- Text message and call sign exchange



Photo 1: The ID-31A 70 cm hand held.

- Transmit position data DR (D-STAR Repeater) mode and repeater list allow you to easily operate using a D-STAR repeater.'

Unlike many handheld transceivers currently on the market, there is no numeric keypad with multiple functions. Instead, the ID-31A has a full dot-matrix display and a directional keypad which allows for quick access to essential features and commands. Combined with the built in firmware, the combination offers operation that is easy-to-use and understand.

The ID-31A includes 552 standard memory channels, with 50 scan edge memories and two call channels. In addition, there are 700 D-STAR repeater memories, which gives a total of 1,252 memory channels. There are multiple scan functions and CTCSS/DTCS encoding.

The transmitter is specified to cover 420 – 450 MHz for the Australian model, guaranteed to work across the 430 – 450 MHz range. Tuning steps available are 5, 6.25, 10, 12.5, 15, 20, 25, 30, 50, 100, 125 and 200 kHz. The transceiver can cope with external power supplies across the range 10 – 16 V DC. Based on the supplied battery pack (BP-271 – 7.4 V 1200 mAh Li-Ion) at 7.4 V, on transmit at five watts output, the unit will draw a maximum of 2.5 A. Transmit power can be set to one of four levels: High 5.0 W, Mid 2.5 W, Low 0.5 W, S-Low 0.1 W.

The receiver is listed as covering 400 – 479 MHz, again with the 430 – 450 MHz range guaranteed. On receive, the unit draws between 200 and 450 mA, depending upon mode and if it is the internal or an external speaker which is in use. The receiver uses a dual conversion superheterodyne system, with IF frequencies of 46.35 MHz and 450 kHz. Sensitivity is listed as less than -15 dB μ in FM mode and less than -11 dB μ in DV mode. Audio output power is listed as 0.4 W into a 16

ohm load (internal speaker) and 0.2 W into an eight ohm load (external speaker).

In addition to FM and DV modes, the unit will also operate in FM-N (narrow FM) mode.

The antenna connector is an SMA female on the unit, requiring an SMA male on the antenna or a coaxial cable connecting to a remote antenna.

Many optional extras are available, including a variety of battery packs (including AA cells) and chargers, power leads, leather case, headset, speaker/microphones and a level converter if you wish to program the unit direct from a computer. The easiest (and cheapest) option for programming is to copy the inbuilt memory contents to the microSD card installed in the ID-31A, and to then use the supplied CS-31 software to modify the memory contents with the microSD card in the computer.

The microSD card is also used by another feature of the radio – the inbuilt voice recorder. You can record received audio for later replay, audio for later transmission or a voice message to use as a DV auto reply message if you are called in DV mode.

The ID-31A in use

This transceiver is a delight to use. It fits snugly in the hand and its size and mass means that it can realistically be dropped into a shirt pocket. There is no need to clip it to a belt via the belt clip, which is a requirement with many handheld transceivers. It was simple to use the radio without reference to the Instruction Manual for basic FM operations. The manuals are well written and it is easy to find your way through the menu system to change settings.

I received excellent reports on air on FM simplex and via the local repeater. You can read Michael's comments below regarding DV (Digital Voice) and DR (DV Repeater) operations. Audio quality during receive was excellent, with

adequate volume from the speaker.

The CS-31 cloning software was simple to use. You do not need a cloning cable if you use a microSD memory card. Be sure to read the manual on installing and formatting the memory card. Beware not to wipe the pre-programmed memory contents! (I accidentally clicked a 'Yes' prompt button without having looked at the manual. However, the situation was recoverable.)

The strong point of the ID-31A really is the way it works on the D-STAR system. I had little opportunity to access the D-STAR system during the review period, so over to Michael VK5ZEA to talk about those aspects.

D-STAR – the ID-31A strong point

Michael Carey VK5ZEA

I use my Icom ID-31A D-STAR radio on a daily basis. I am fortunate in that I can play with my ID-31A while at work and this allows me to check into a lot of overseas D-STAR nets around the world. On an average week I check into around 10 D-STAR nets which tend to be conducted in the morning (Australian time).

Operationally the ID-31A is quite different from my previous Icom IC-91AD radio. This is mainly due to the lack of the more familiar numerical/function keypad. All of the numerical/operational buttons on the front of my IC-91AD have two functions...this makes quick access to a lot of functions relatively quick and easy...the ID-31A goes about things a little differently...

Most of the common D-STAR operations can be performed by using the central D-pad in the middle of the control keys. This in conjunction with the Menu and Quick Menu keys makes using the ID-31A in D-STAR mode very intuitive.

One of the main features of the new Icom ID-31A 70 cm handheld radio is its D-STAR capabilities.



Photo 2: The ID-31A 70 cm hand held beside its older cousin, the IC-92AD.

In my opinion, this more than makes up for the fact that the ID-31A is a single band (70 cm) radio in a world where virtually all new handheld radios are a dual band device.

I have been using D-STAR since January 2008. In July 2008 I installed the VK5REX B 70 cm D-STAR repeater in Port Lincoln and I really haven't looked back, I'm a D-STAR-aholic!

The ID-31A incorporates all the familiar D-STAR features of past Icom D-STAR radios and adds a whole heap of new ones!

Probably the most welcome feature addition in the ID-31A is the incorporation of an internal GPS receiver. The sensitivity of the internal GPS is remarkable, although accuracy does suffer if the GPS is inside a building...the better the view of the sky, the more accurate the position.

The GPS receiver has several functions...the first is a no-brainer, it allows you to send your GPS position when you key up in D-STAR

mode. One of the features of the D-STAR protocol is that it allows you to send data at the same time as digital voice. This data can take several forms, but GPS data is a common use. When the ID-31A is in GPS-A mode, this position data takes the form of a more familiar APRS position frame. A D-STAR Gateway computer can extract this from the D-STAR data stream and send it off to the APRS-IS system. All previous Icom D-STAR radios had this feature as well, but the ID-31A is the first handheld where the GPS receiver has been integrated into the transceiver.

The ID-31A can also use NMEA data from an external GPS, plus you can manually enter a position. In the GPS mode, there is an option to switch on the GPS to get a fixed position and then turn it off. Great if you are operating stationary portable and don't want the GPS receiver to drain the battery. You can also send NMEA GPS data from the internal receiver out through the serial socket, fantastic for feeding

position data to a laptop, APRS tracker or navigation device.

The GPS receiver can also be used to set the ID-31A's internal clock, very handy!

The other novel use of the GPS receiver is to allow the user to easily set up the ID-31A radio to use a nearby D-STAR repeater based on location. If you travel to a new area with a D-STAR repeater, the radio can use the position determined by the GPS to program the repeater frequencies, offset and callsign information automatically. For example, if you hopped off a plane at the Port Lincoln airport, your ID-31A radio could configure itself to use the Port Lincoln VK5REX B D-STAR repeater with four quick button presses. The ID-31A comes pre-programmed with D-STAR repeater information; updated information can be downloaded from the Icom Japan/Global website. This makes it quite easy for a new user to get things going with minimal user programming required. One little criticism is that this function only works with D-STAR repeaters...it would be great if the database could be expanded to include FM repeaters too. Imagine turning your handheld radio in a new city and having it 'find' the closest repeaters and then automatically configure frequencies, offsets and CTCSS tones.

The ID-31A can also log GPS positions to the MicroSD card. The interval at which the positions are recorded can be selected from 1, 5, 10, 30 or 60 seconds. The file that is saved in the MicroSD card consists of the raw NMEA data sentences from the GPS receiver. I've successfully been able to load GPS log files created by the ID-31A into Google Earth. The ID-31A also has a GPS Logger Only mode where all other functions of the radio are turned off, extending the operating time of the GPS logger considerably.

Operationally, the most commonly used D-STAR functions are accessed through the central

D-pad. Each quadrant of the ID-31A D-pad has two functions, a quick press is used to navigate within menus and the central blue button is the OK or Enter key. The secondary functions of the D-pad keys are accessed with a long press. The up key performs the D-STAR RX>CS function where you can review past received D-STAR calls and then set the calling stations D-STAR callsign in the ID-31A's URCall field...great for using the traditional D-STAR repeater callsign routing capability.

A long press of the down key enables the DR (D-STAR Repeater) mode, this makes using the D-STAR callsign routing functions more intuitive and easier than in previous non-DR mode enabled D-STAR radios. In the DR mode you can use the GPS to select your nearest D-STAR repeater and also select the repeater or D-STAR user you want to send your D-STAR call to.

A long press of the left key brings up the received callsign history. This is where you can go back through the last forty received D-STAR calls. Each entry holds a whole heap of information...the callsign of the calling station, the 20 character 'text' message sent along with the transmission, the time the call was received (always accurate with the GPS referenced internal clock), if the received station was transmitting GPS information this too is displayed along with course and speed information, their maidenhead grid is also shown along with a distance to their station from you. This received callsign list is updated with each received call... the newest is at the top of the list.

A long press of the right key brings up the callsign menu. This is where you can change the four D-STAR callsign fields, UR, R1, R2 and MY. The most common one that most users change frequently is the UR or URCall. This is normally set to CQCQCQ but is used to command the Dplus linking system. Dplus is the add-on software that works with

the Icom G2 gateway software that enables 'IRLP style' linking.

The ID-31A has 200 URCall memories which is a most welcome increase over the 60 I have in my IC-91AD. The Dplus linking system responds to 'commands' in the URCall field to connect and disconnect links to other gateways or reflectors...the more URCall memories you have, the more commands you can store. The default configuration files that can be downloaded from the Icom Japan/Global website have pre-programmed link commands for Dplus reflectors 001 to 047, each with three modules A, B and C. Dplus has recently been upgraded to include modules D and E. I have modified my memories with links to the Dplus reflectors that I use the most. A little bit of forethought with programming beforehand can make real-world Dplus linking operation of the ID-31A very easy.

The Quick Menu key is context sensitive, when pressed it will bring up options that relate to what you are doing at that time. This is makes using the ID-31A, even without a full keypad, extremely easy.

I find the speech function of the ID-31A an amazing feature. Others have found it annoying; I suppose it is a personal choice. The speech function enables the radio to announce received D-STAR calls by reading out the callsign in either English or Japanese. There are two speech modes; one announces every time a call is received, the other mode is the one I use. Called 'Kerchunk', it only speaks the callsign after a short transmission. On D-STAR, you are identified by your radio each time you transmit. Your callsign is embedded in the data stream and a lot of operators simply quick-key to announce their presence. With other D-STAR radios you would then need to either look at the screen to see who pressed their PTT, or you would need to go through the 'called' menu and review the received call that way.

With the ID-31A's speech function, the radio will read this information out for you. Some have complained about the US pronunciation of the 'Z' character...I simply selected the 'phonetic' alphabet and each letter of the callsign is read out in the phonetic alphabet.

There are also tone controls for use with the D-STAR DV mode. The user of the radio can adjust TX bass and treble and RX bass and treble. There is also a RX bass boost function to restore a bit of bottom end to received audio that can be missing at times.

I've found the receive performance of the ID-31A in D-STAR mode to be exceptional. I've not had the opportunity to view a service manual of the ID-31A to see the GMSK modem section to compare to other Icom D-STAR radios...but I expect that lessons learnt from earlier D-STAR radios have been incorporated by Icom into the ID-31A.

Conclusions

The ID-31A is a compact, highly capable and lightweight 70 cm handheld which performs superbly. As supplied, it comes with all the essentials, including a software package which enables one to easily manage the large number of memory channels available. It makes the use of the D-STAR system much easier to use for someone who is new to the system.

It will be interesting to see the next generation D-STAR capable dual band hand held when one is released. The ID-31A with its extensive capabilities gives an interesting glimpse into the direction that Icom is taking with its radio development.

The ID-31A is excellent value for money – they are selling for \$399.00 from authorised dealers.

Thank you to Icom Australia for the loan of the unit used by VK3PF.