

Handheld with the lot: the IC-92AD

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Waterproof, 2 m & 70 cm, D-STAR, in a dual band 5 W handheld transceiver – what more do you need? GPS? World Wide Coverage? Done!

The IC-92AD is a dual band (2 m and 70 cm) five watt D-Star handheld transceiver that features D-Star and full traditional analog voice capability, but a swag of features.

The receiver gives wideband reception options as well, as can be seen from Table 1. Standard transmit operations are FM and Digital Voice (DV) modes, with DV only available on band B.

With the addition of an optional HM-175 GPS microphone, you have comprehensive GPS operation, which beacons positioning data via the international D-STAR and APRS networks. It also displays and transmits

local positioning data with other D-STAR compliant radios, in terms of position, elevation, distance and direction: functions which are performed extremely well by both the IC-92AD and its big brother IC-2820H mobile.

It is easy to assemble the radio on opening the box – in the most basic form, simply connect the battery pack to the transceiver and screw on the SMA connector whip antenna. Just to be sure, charge the battery pack. Also supplied are a wrist strap and a belt clip, which requires the fitting of two supplied screws.

The BC-177 provides capability of rapid charge of the BP-256, typically about 2.5 hours. This charger is an optional extra. The transceiver is supplied with a standard “wall wart” style charger.

The BP-256 battery pack is a 7.4 V 1620 mAh Li-Ion pack, giving 5.5 to 6 hours of operation time when on high power (5 W). If you switch to Low power (0.5 W), battery life is quoted as 14.5 hours. Mid power (2.5W) will typically give you around 8 hours of operation – plenty of time for an average day out. Using the standard charger, charging time is approximately 6 hours. This will be achieved only if the radio is off during charge – leaving the radio on will result in an incomplete charge or require a longer charging time. Another available option is the BP-257 battery pack, which will hold six AA alkaline cells. Whilst this pack may be an attractive option, its use drops power output to typically 0.1 W.

In addition to use with a battery pack, the IC-92AD can be used with other supply lead options, up to a standard 12 V supply: specified supply limits are 10.0 to 16.0 V.

The transceiver has a large clear display showing many status icons – all together, there are 18 items which can be displayed, depending upon mode of operation. It can be multi - configured as either a single band or a dual watch display – displaying the frequency or memory name in actual use when in single band mode, or the frequencies or memory names of both bands when in dual band mode.

Photo 1 provides a view of the IC-92AD with HM-175GPS attached, with the display in “dual watch” mode. If you select memory name mode then you can display the repeater callsign, locations or simplex names etc via alphanumeric tagging capability.

Below the display, there are a number of control buttons: at the bottom portion of the unit is a five wide by three deep keypad array. Between this keypad and the display are four buttons – a larger “Main/dual” button, the power switch, and two buttons for Band and Menu.

Having assembled the transceiver and

ensuring that the batteries are charged, it is relatively easy to set up a local simplex or repeater frequency if you have used earlier Icom handheld radios. This is because of the consistent style of control ergonomics used by Icom. A newcomer may find the system a little confusing, but it is easy to learn the basics. Colour coding of the multiuse buttons assists in the learning process.

Many of the main keypad buttons have three or even four functions each, with each function colour-coded. The function of the key will depend upon the current context and the length of duration of depression of the keypad – a momentary press gives the black operation (for example, entering a numeral), whilst a press of longer than one second will give the purple colour-coded function. It does not take long to get the hang of this menu system intuitively but a radio with this level of functionality, needs the operator to read the manual...at least once.

To assist you, this operation is clearly outlined on pages 4 and 5 of the operating manual, which has 156 pages in total. A further option for the appropriate buttons is the sending of a corresponding DTMF tone, which occurs if the button is depressed whilst the PTT is activated.

The keypad summary chart, as well as pages 2 and 3 indicating the names of each of the controls, has links to the page of the manual which gives the detailed description of the function in question.

This is relatively straight forward for normal FM operation.

On the other hand, it is best to read the manual if you intend using the radio on the D-STAR system, simplex or via one of the repeaters. The standard mode of Digital Voice (DV) can only be activated on the B VFO (or band). Like all Icom D-STAR transceivers, you will need to set up a number of parameters such as your callsign (mycall) and a few other details of any repeaters that you wish to access. The D-STAR Australia web site (<http://www.dstar.org.au>) has lots of

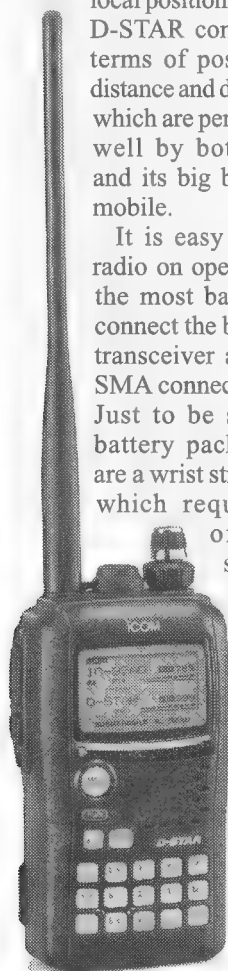




Photo 1: The IC-92AD and optional HM-175GPS, with the display in "dual watch" mode.

helpful information for the newcomer. It also has files you can download and program into the IC-92AD, or any other D-STAR radio. These are setup for each Australian state, thanks to Dave Tilson VK3UR. Do not forget to register on this website so you can be enabled for gateway operation to explore the full capabilities of the international D-STAR network.

The international network now has 350 plus repeaters around the world and is growing at a fast rate. Once registered, you can call anyone with D-STAR equipment around the world, just like calling on your local repeater, but also send SMS data and position data, all simultaneously with the IC-92AD.

One area of interest to explore was GPS operation.

A few minutes reading the relevant pages from the manual and following the instruction resulted in the GPS display operating correctly. It took a few minutes for the receiver to initialise, as do all

GPS receivers when operated for the first time – they need to acquire the location of the receiver from the GPS satellite constellation. The manual has 11 pages describing the various options available when operating with either the HM-175GPS or an external GPS receiver. I set the unit up for GPS Mode, a simple position display, as can be seen in Photo 2. This photograph was taken whilst on a walk one damp afternoon along a local path. Despite the tree coverage, with all the leaves being wet and acting as RF attenuators, the GPS was reporting position at all times.

In GPS mode The IC-92AD can also show the compass direction of a received D-STAR station, its position and distance

away or to a memory stored with a compass-like display pointer.

On further exploration I found that in another mode GPS - A mode, the IC-92AD can beacon your position data, to the nearest D-Star repeater within range. This is known as DPRS, a cousin protocol to APRS. The data will then be processed and sent to the APRS system via the internet and to various web sites for information and map display, like Google® maps, Jfindu and aprs.fi Note: With all WIA D-STAR repeater systems, and many of the club systems, the DPRS position data is interfaced into the APRS system. DPRS stations can be viewed on software map packages like UI-View®.

I had no qualms taking the unit with me for a walk that afternoon, despite the scattered showers. I did not even need to worry about keeping the transceiver out of the rain – the IC-92AD is waterproof to IPX7 standard – Icom claims that it will tolerate immersion in water up

to one metre deep for a period of 30 minutes. I have seen the IC-92AD immersed in water at about 40 cm depth for at least three hours at a hamfest. At the end of the day, the staff simply removed the transceiver, shook off the water and the radio worked perfectly. The main unit, the BP-256 and the HM-175GPS all comply with IPX7. What does that really mean – there should be no problems with exposure to rain or dropping the unit into a shallow pool of water. Note that the BP-257 Dry Cell case is not waterproof.

Having had an initial exploration of the transceiver and its basic functions, it was time for deeper examination of the capabilities of this transceiver. This is possible without resort to the manual for many functions, but it is recommended that you spend some time reading.

One obvious place to start is to program some commonly used frequencies into memory. This is one place where you have plenty of choice – there a total of 1304 channels, including 100 program scan edges and 4 call channels, with the memories arranged in 26 banks. This may seem to be a little daunting at first, but Icom also have that aspect covered. The first step is to purchase the optional RS-92 remote control software, which includes the OPC-1799 RS-232C PC connection cable. The next step is to download a configuration file from the Australian D-STAR website, which gives you a standard setup file which includes all the standard repeater and simplex frequencies used in Australia, including CTCSS tones if needed. Both FM and DV operation frequencies and memory naming are configured in this file. All you do is select the corresponding file that matches your local repeater and that is it. You can modify the file once you have opened it in the RS-92 software. Once you have configured the memories in the software package, it is then a simple matter to connect to the IC-92AD via the OPC-1799 cable and to transfer the memory settings to the transceiver. Most functions of the transceiver can be controlled via the RS-92 package. If you are using the DV mode, you can use the package to send and receive short text messages (up to 20 characters) via the PC.

Downloading the file made the radio really easy to use, because of the well structured memory channel plan. Each

D-STAR repeater and each Australian analog repeater has a channel allocation. All you need is a WIA repeater list and to turn on the radio. Repeaters can be selected by frequency, callsign or name.

For example, if you want to talk to a friend in Kent, Southern England, on DV mode, just turn to channel 143, or to call a friend in Munich Germany, just turn to Channel 124, a friend in the Ozark Mountains Missouri, that is Channel 323 and just give them a call.

In next year's WIA call book, Icom and the D-STAR Users Group will supply a full listing of national and international D-STAR repeaters, information and configurations.

The receiver has a simple bandscope function, which will show the received signal strength on the display, with any received audio audible via the speaker whilst the scan is in progress.

When using the DV mode, you can record up to 30 seconds of audio from an incoming call to memory – as a single file or up to three files of 10 second duration. You can record up to ten seconds of audio for use for outgoing calls – for example your callsign and a CQ message. The IC-92AD also has auto messaging system, if a D-STAR station directly calls you via callsign routing, your IC-92AD has the ability to call the calling station back with a voice reply, like an answering machine.

The IC-92AD has several other features that I did not explore. There are 10 DTMF memories, each storing up to 16 digits. This will simplify often used DTMF operations, such as accessing EchoLink or IRLP nodes. There are Power save, auto power off and power on functions, all of which will extend battery life. A time out timer can be set for 1, 3, 5 or 10 minutes, with the timer giving you a beep warning 10 seconds before the timer disables the transmitter. There are many other features which can be useful in many circumstances – one just needs to read the manual to understand how they operate.

Of course, if you happen to make a major error in making settings and

are hopelessly lost, you could always resort to initiating a master or partial reset of the transceiver. Hopefully it will not come to that! A partial reset will save your stored memories, whilst resetting all other functions to the factory defaults.

The transceiver was a delight to operate. I received good audio reports at all times. Whilst I did not attempt to transmit on DV mode, the signals received in DV mode provided clear audio. The transmitter can be set to 5, 2.5, 0.5 or 0.1 W. The receiver sensitivity depends on the frequency in use, but is quoted as 0.14 μ V near 2 m and 0.16 μ V near 70 cm for FM (12 dB SINAD and 3.5 kHz deviation) and 0.22 μ V for DV mode on the amateur bands (1% BER). For detailed specifications, request a brochure from your local dealer or see the Icom website at <http://www.icom.net.au/>

If I were currently in the market for a handheld transceiver, the IC-92AD would be at the top of my list.

At the time of writing, the IC-92AD was available for \$695 “whilst current stocks last”. I am sure all are aware that the Australian dollar has depreciated considerably in the last few months, so prices are sure to vary. The optional HM-175GPS can be found for around \$395 at present, but the same caveat applies. To be safe, check with your local Icom authorised dealer for current pricing.

I thank Kitty at Icom Australia for the loan of the IC-92AD and HM-175GPS.

Photographs by the author
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Photo 2: The IC-92AD and optional HM-175GPS displaying the current position using the GPS-A function. No need to worry about dampness or rain drops with this radio, rated waterproof to 1 m depth for up to 30 minutes.

Hello, my fellow Australian amateurs,

The IC-92AD repeatedly amazes me by the number of features available.

Being with Icom, I haven't purchased many rigs for myself, however I love the IC-92AD and have owned one for about 3 months,

It is a small wonder. Can I suggest that all users please read the manual in earnest, do some experimenting and then read the manual again!

As I did! There are support/user groups around. Don't forget to look at www.dstar.org.au for all your D-STAR info and to register for gateway access. On the site you can also register to be part of D-STAR Lists forum, so any questions can be answered promptly by experienced 92 and D-STAR users. Icom also glances at the list so if we can be of help, or to clarify things, we are there!

73, Peter VK3TQ Icom Australia

Table 1: Transmit and Receive coverage specifications

Transmit (MHz)	Receive (Working range) (MHz)	Mode
144–148 420–450	A band: 0.495–999.990	FM/WFM/AM
	B band: 118–174, 350–470	FM/FM-N/AM/DV