REVIEW

The ICOM IC2A 2m Hand Held Transceiver

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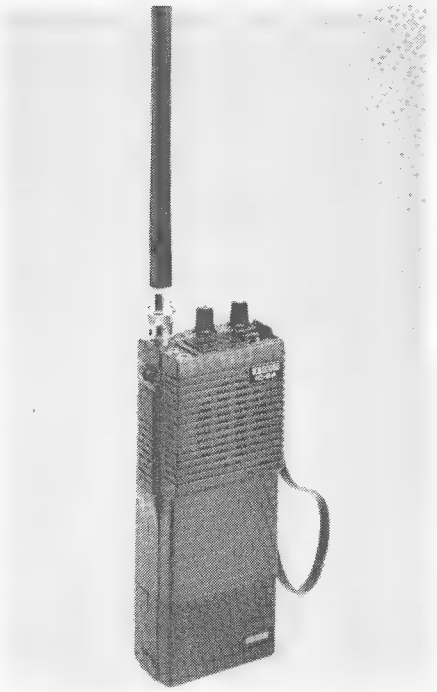


PHOTO 1

As the advertisements put it, 'When is ICOM coming out with a "Handie-Talkie". Well, they have. And of course, now everyone is going to ask: just how good is the new IC-2A and what does it offer?

There is no doubt that the ICOM name is synonymous with VHF gear of excellent design, reliability and certainly popularity. It might surprise newcomers to the hobby that this reputation has been built up over only about eight years. The first ICOM or, as they were known then, INOUE IC-20 two metre FM transceivers were marketed by the Industrial and Medical Electronic Co. of Melbourne about the middle of 1971. With two channels installed they cost $295. Those of us who consider amateur gear expensive should make a few comparative calculations. However, the first INOUE gear that came into Australia was in fact an all band HF transceiver imported by Syd Clark VK3ASC, a couple of years before the IC-2D.

ICOM have come a long way in a very short time. So on this basis, just what should we expect in a two metre handie should we expect in a two metre hand talkie from ICOM? I must admit that on my first encounter with the IC-2A I was a little disappointed. After all, it didn't even have one memory, let alone scanning or other features that seem to be essential to the ardent FM operator. However after a short time operating the little rig my opinion changed.

Let's look at the IC-2A in some detail. The size is impressively small. It will fit easily into a shirt pocket and is certainly the smallest two metre hand held on the local market. The overall dimensions are 65 mm wide, 35 mm deep and 16.5 mm high and weight 470 grams. The height and weight can vary depending on the battery pack chosen, and this in turn affects the transmitter output and battery life. Our review is based on the smaller battery pack and so transmit performance figures given later are in accordance with this.

The IC-2A is simplified in both concept and to some extent in operation. Perhaps simplified concept is not quite the right way to describe a full coverage 800 channel two metre transceiver, but ICOM have chosen to offer a transceiver without electronic frequency display, memory or scanning. Perhaps it's a sign of the times that we can describe such a transceiver as basic. Frequency selection is also simplified and uses thumb wheel switches to select the 10, 100 and 1000 kHz segments with a small slide switch for five kHz up. Repeater operation is provided with either a + or —600 kHz transmit facility but no instant selection of reverse repeater mode is available. Transmit-receive change-over is accomplished by solid state switching so the PTT handle on the side only has to operate a small microswitch. There are two immediate advantages. One, the effort on the part of the operator is small and not tiring over a long period, and two, an external PTT microphone can be plugged in and used in, for example, mobile operation. The antenna supplied with the set is the usual flexible helical connected to the set via convenient BNC socket. Transmitter output is rated at 1.5 watts on high and 0.15 watt on low. Our IC-2A output was a commendable 2 watts and it should be noted that in the near future when the larger optional battery pack is available the output should be around the 5 watt mark.

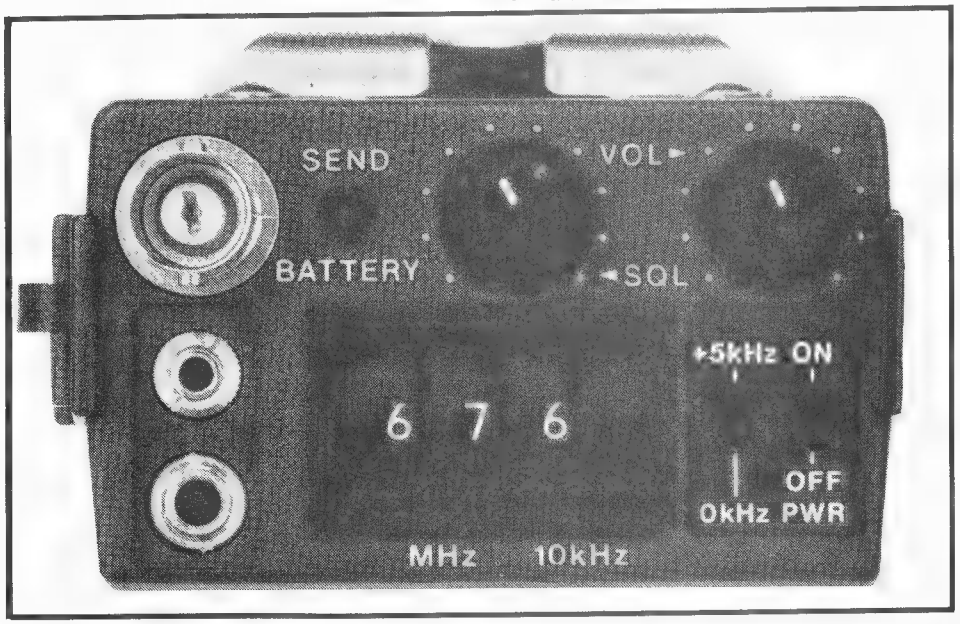


PHOTO 2: The simple control functions on the IC-2A are illustrated in this view of the control panel.

The battery pack itself is worth a note. It can be detached from the bottom of the transceiver simply by sliding it to the side. The charger connection socket is actually part of the pack. ICOM recommend that the battery should be charged when detached from the transceiver. However, we took a chance and found that the IC-2A worked very well while the battery pack was in place and actually under charge.

One common question asked by interested amateurs after looking at the IC-2A advertisement is where is the repeater offset switching? Simple — on the back of the cabinet.

Advertisements claim "ICOM Level Receiver Performance". Presumably this infers that the IC-2A receiver is as good as, say, the IC-22S. In some aspect I don't believe this to be so — but more on this later.

THE IC-2A CIRCUIT

With a total of 43 transistors, 3 FET, 5 ICs and 21 diodes, it's amazing just what can be fitted into a small box these days. The heart of the device is the PLL unit that supplies 72 to 73.9975 MHz to the transmitter multiplier stage and 66.6525 to 68.65 MHz to the receiver first mixer. Four crystals are diode switched to produce either simplex, +600 kHz, —600 kHz, or the plus 5 kHz modes of operation. The thumb wheel switches operate a programmable divider in the PLL chain to actually select the channels. The VCO is modulated to produce an actual FM (not phase) signal).

The receiver circuit is a model of simplicity. Two bipolar transistors in cascode provide RF amplification to FET first mixer. The first IF is at 10.695 MHz and employs a crystal filter and two stages of gain. Now we come to the interesting part. A single IC incorporates the second mixer, its associated crystal oscillator, the 455 kHz IF amplifier, the FM detector and the noise amplifier for the squelch circuit. Some IC. Four more transistors are used in the squelch circuit and a single IC for the receiver audio.

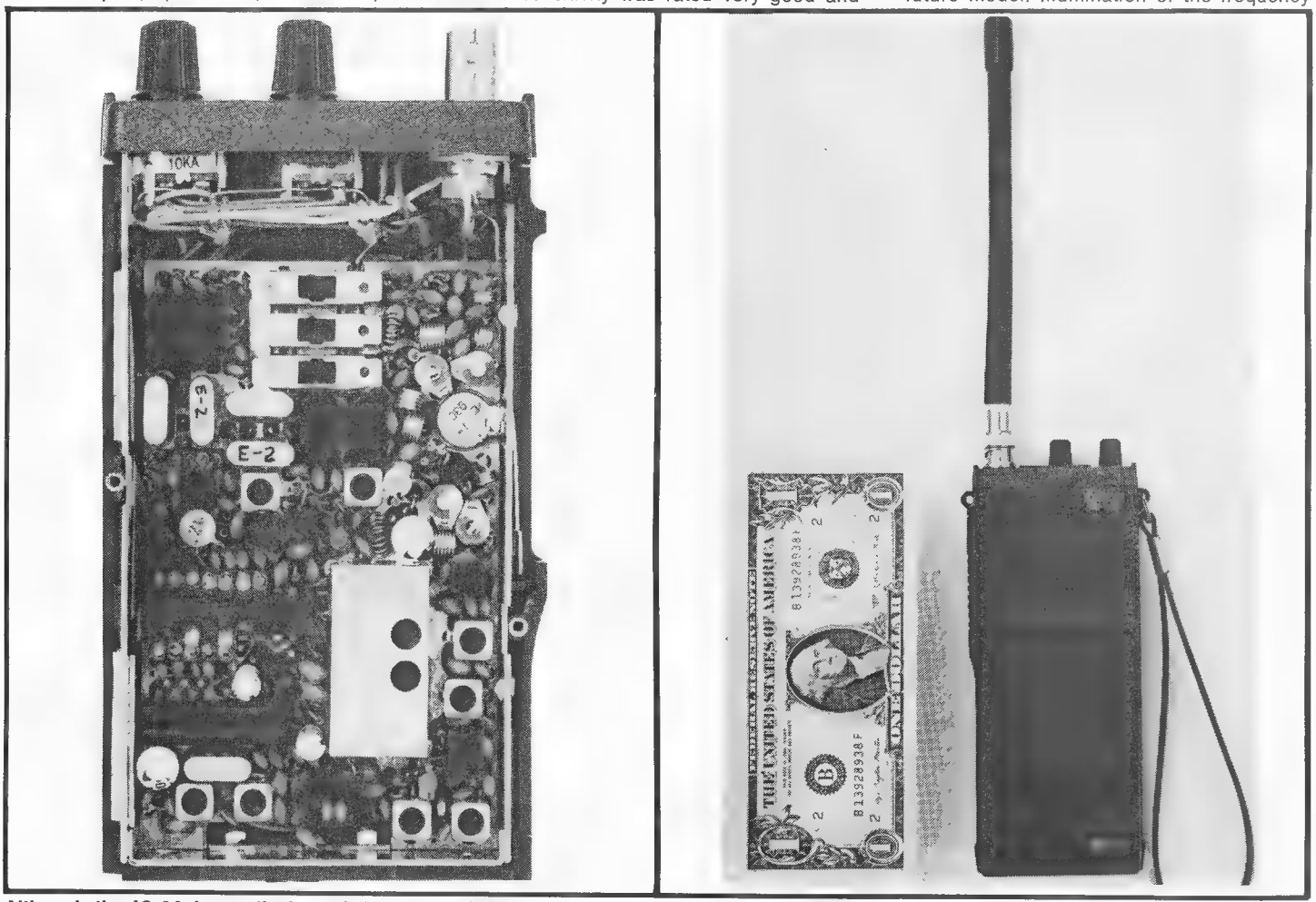
THE IC-2A ON THE AIR

First comment is on the thumb wheel frequency selection. I think these should be named fingernail switches. They are definitely easier to operate with the index fingernail, and you then have a chance of seeing the numbers. If you plan to operate after dark, take a torch — there is no provision for illumination of the readout. Selection of a given frequency is quite easy, but it is not so easy to tune across the band to hear what is happening. Receiver sensitivity was rated very good and quite comparable with other modern FM transceivers. However as noted earlier the receiver performance was not "ICOM Level". Rejection of noise such as auto ignition hash and general household appliance hash was poor. I suspect there is only a very small amount of limiting provided in the multi-function IC described earlier. In general strong signals are not affected, but weak to moderate signal level can be affected to varying degrees depending on the level of the interfering noise.

Transmit audio quality is clean and the response balanced but the distance from the microphone is fairly critical. On the IC-2A we had for review the best quality occurred at about 8 or 9 cm (3 inches) from the microphone with my particular voice. Receive audio quality was clean but output power was limited under mobile conditions. An extension speaker with higher efficiency than the very small inbuilt unit appeared to help somewhat.

The flexi antenna supplied worked about as well as expected for this type — just so so, but at times one can be surprised just what can be done with hand-helds and simple antennas.

After using the IC-2A over a number of days, only two things came to mind which might be desirable to incorporate in a future model. Illumination of the frequency



Although the IC-2A is small, the unit is crammed with components as PHOTO 3 (left) shows. The size of the unit is best described in PHOTO 4 (right) where the unit's size is compared to an American dollar bill.

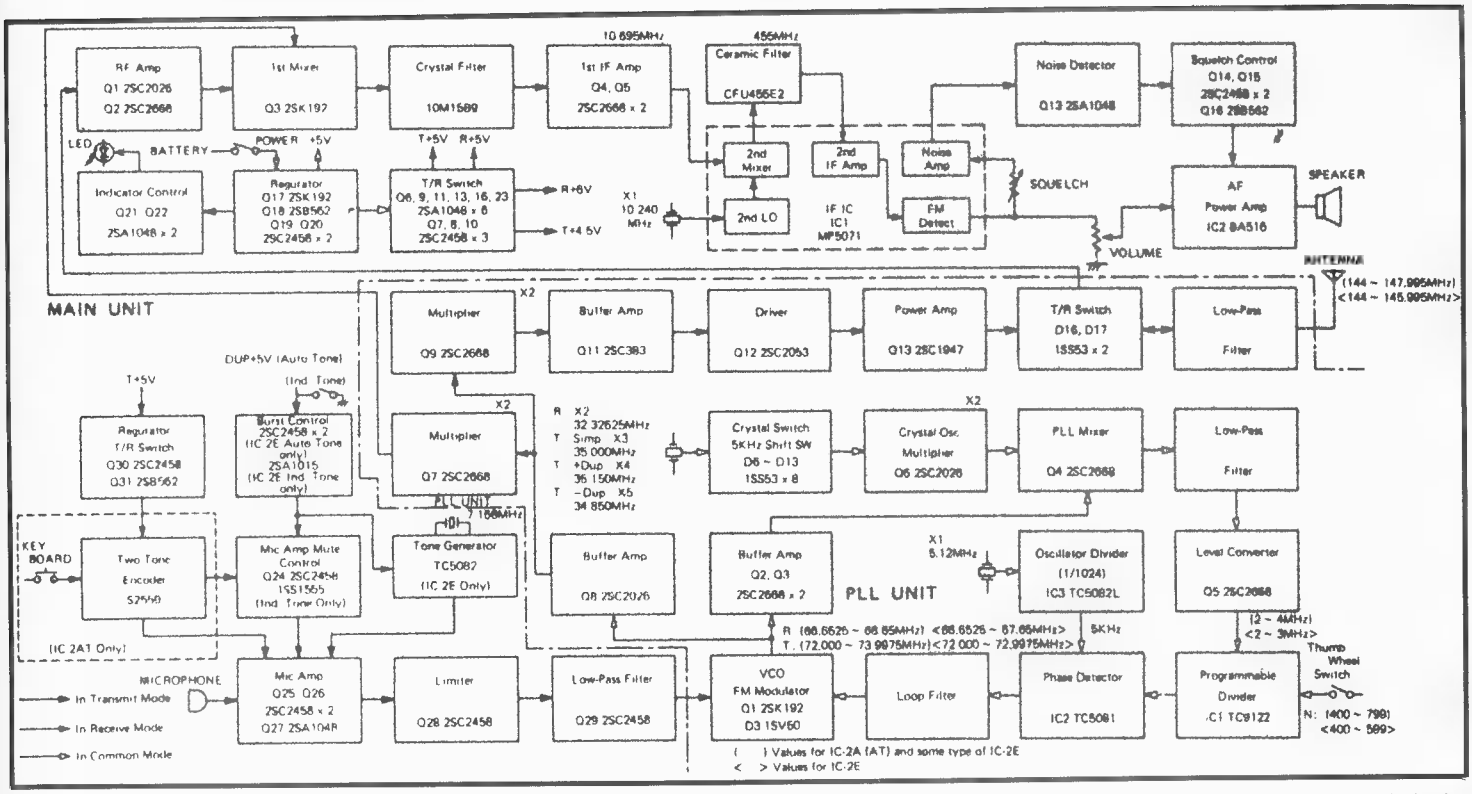


FIG. 1: Block diagram of the IC-2A.

readout, say with a push button switch and the ability to listen on the repeater input frequency. It seems that we are doomed to accept the now universal lack of meters on hand-held transceivers. A pity in many ways. A signal strength indicator was always useful to find the best transmit location into a repeater.

INSTRUCTION BOOK AND ACCESSORIES

Accessories supplied with the IC-2A include the slide on nicad battery pack, a charger for same, which plugs directly into the AC power point and connects to the battery pack via a flexible lead. There is a flexible antenna, a belt clip and a hand strap, plus a couple of miniature plugs for microphone and earphone connection. We believe that a leather case and an external microphone speaker unit will be available shortly.

The instruction covers all the required information in a clear and concise way. A trouble shooting chart included covers only operational errors and not technical problems, but a comprehensive voltage chart included would be of help to those game enough to attempt their own service. An internal photo clearly points out the various adjustment locations. The circuit diagram supplied is fairly large and easy to read.

Our test unit was kindly supplied by VICOM of 68 Eastern Road, South Melbourne 3205, and all enquiries regarding price and delivery would be welcomed. ■

Repeater Quiz

1. The proper way to enter into a QSO on a repeater is to:
   (a) say "breaker six".
   (b) just say "break".
   (c) insert your call during a pause.
   (d) just talk over the other guy; you're at a base station anyway.

2. The main purpose of a repeater is:
   (a) to keep technical types on their toes.
   (b) to enhance the range of mobile stations.
   (c) to provide a soap box for long, one-sided monologues.
   (d) to allow non-amateur housewives to keep track of their wandering husbands, or anyone else for that matter.

3. One of the most important uses of a repeater is to:
   (a) provide good mobile-to-mobile communications when driving adjacent to each other on the expressway.
   (b) enhance the range of base stations located less than three blocks from each other.
   (c) extend the range of mobile and low power portable stations.
   (d) none of the above.

4. You should sign your call letters:
   (a) any time the spirit moves you.
   (b) after every other word.
   (c) at the beginning and end of each transmission.
   (d) once coming on and once leaving the frequency, and once every ten minutes.

5. You are required to mention at least one of the call letters of the stations with whom you have been talking:
   (a) at the beginning and end of each exchange.
   (b) at the beginning and end of a series of transmissions, and once each ten minutes during the exchange.
   (c) only at the end of a series of transmissions, when signing off.
   (d) none of the above.

6. Repeaters:
   (a) don't cost anything to operate as everything is donated.
   (b) cost a bundle, but are paid for by a small group of wealthy amateurs and supporters.
   (c) cost a bundle and are financed by club member dues and contributions.
   (d) shouldn't expect any donations from users since the airwaves are free.

7. When you talk to a regular user of the repeater who is not a member of the club or a financial supporter, you should:
   (a) tell them they are deadbeats and refuse to talk to them.
   (b) notify the control operator to turn off the repeater.
   (c) try to find out if they understand how the club/repeater operates and invite them to participate.
   (d) try to embarass them into paying or leaving.

From ARNS Bulletin, January 1980, and probably many other sources. ■