

IC-2200H

144MHz FM Mobile Transceiver

QST Product Review

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ICOM IC-2200H 2 Meter FM Transceiver

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ICOM has introduced a new single band mobile transceiver with many functions and features. While some amateurs may not necessarily need all these “bells and whistles,” they will find that the IC-2200H will meet the requirements for nearly every 2 meter application.

“Wow, all heat sink!” was my first impression when I pulled the radio out of the box. To answer that first question—no, there’s no cooling fan! The IC-2200H does come with a remote control microphone; 3 meter long, fused dc cable; mobile mounting bracket with hardware, and microphone hanger.

This is a compact, no-nonsense, 2 meter FM mobile transceiver, weighing in at about 3 pounds. It includes all the features one would desire in an FM transceiver—CTCSS encoding and decoding (referred to as *Tone Scan*), DTCS or digital tone coded squelch, which performs a similar function to CTCSS using short sequences of sub-audible tones and is currently in favor with some emergency agencies, auto repeater offset, DTMF operation (DTMF decoding can be provided with the optional UT-108 Decoder Unit), programmable memory scan and band scan. The price is just above other single band radios, perhaps justified by the plug-in digital capability to be discussed later.

The radio includes expanded receive frequency coverage from 118 to 174 MHz, for both FM and AM modes. You can set the FM receive passband width from wide to narrow to match that of other services you may wish to monitor. The transmitter provides four power output settings: HIGH (65 W), MIDDLE (25 W), MIDDLE LOW (10 W) and LOW (5 W). I found the 5 W setting, appropriate for repeater operation in my area and used higher power just for some simplex operation.

The '2200H provides a total of 217 memory channels. This includes 6 scan edge memory channels (for scanning) and 1 call channel. There are 207 regular memory channels and 10 easily accessed memory *banks* (listed as A to J). Each memory can have up to a 6 character alphanumeric label including some symbols, such as *slash* or *star*.

It's Not a Busy Radio!

The front panel includes nine non-



backlit buttons. With the exception of the POWER, S.MW(MW) and BANK (OFF) buttons, the functions of the remaining six buttons are labeled on the display. The POWER button is located to the left of the VOLUME control, with the S.MW(MW) below it. The RJ-45 modular style microphone jack is located beneath these two buttons. The BANK (OPT) button is located just below the MAIN dial. The letters in parentheses indicate those functions that are obtained through a menu procedure.

Reading from left to right on the display are the LOCK/SET, ANM/MONI, DUP/LOW, T-SCAN/TONE, PRIO/M/CALL and SCAN/V/MHZ functions. (The second listed functions are obtained by depressing the buttons for about a second.)

The LOCK/SET button toggles between locking the display or entering the SET mode. In the SET mode, the user may change various options, such as the color of the display (amber or green) or the CTCSS tone. The ANM/MONI button lets a user turn the monitor function or the channel names on or off (when using alphanumeric names for memories). The DUP/LOW changes the power settings as well the repeater offset, overriding the auto shift as needed. The T-SCAN/TONE button allows a user to select a tone function, whether it be the tone encoder (CTCSS), pocket beep, tone scan or even some of the functions related to digital mode operations (not available at press

time). The PRIO/M/CALL button enables priority watch on a selected watch channel or a change to weather channel mode. The SCAN/V/MHZ button enables scanning or toggles between the VFO and memory channels.

The S.MW(MW) button is used for memory channel programming including incrementing the channel number. The BANK (OFF) button is used to select among the 10 memory bank channels.

Three solid plastic knobs are used to control VOLUME, SQUELCH and MAIN DIAL functions. The knobs are indented and have a smooth feel. I found it easy to fly by a desired setting with the MAIN DIAL until I got the feel for it.

The multi-function LCD display (measuring about 1 × 3 inches) has clear, easy to read alphanumeric characters. The display’s brightness (DIM) level can be adjusted via a menu setting.

The display allows viewing from different angles. Even with it sitting atop my desk, I can look down and still read the display. When operating the radio from my truck, I found I was still able to see the display, although to me it appeared a bit easier if the display were amber—nice to have the choice. Speaking of the display, the front panel is not detachable.

On the rear of the radio, looking left to right you’ll find the two-pin standard locking power plug pigtail. Above that are jacks for the external speaker and for DATA IN. Next is the large heat sink. A standard SO-239 chassis-mounted antenna connector rounds it out. Since the antenna connector is somewhat recessed between some long cooling fins and a smaller one on the opposite side of the connector, screwing on the PL-259 takes nimble fingers.

As noted, this radio is like one big heat

Bottom Line

With the IC-2200H ICOM has a solid 2 meter mobile radio ready to be upgraded to digital voice and data as soon as the optional module becomes available.

Table 1
ICOM IC-2200H, serial number 0501183

Manufacturer's Specifications	Measured in the ARRL Lab
Frequency coverage: Receive, 118-174 MHz; transmit, 144-148 MHz.	Receive and transmit, as specified.
Power requirement: Receive, 1.0 A (max audio); transmit, 15 A (high power).	Receive, 0.6 A; transmit, 13 A. Tested at 13.8 V.
Modes of operation: FM, AM (receive only).	As specified.
Receiver	Receiver Dynamic Testing
FM sensitivity, 12 dB SINAD: 0.14 μ V typical.	For 12 dB SINAD, 0.13 μ V.
AM sensitivity: Not specified.	For 10 dB S+N/N: 120 MHz, 0.57 μ V.
FM adjacent channel rejection: Not specified.	73 dB.*
FM two-tone, third-order IMD dynamic range: Not specified.	73 dB. 10 MHz channel spacing: 91 dB.
FM two-tone, second-order IMD dynamic range: Not specified.	90 dB.
S-meter sensitivity: Not specified.	S9 indication: 5.9 μ V.
Squelch sensitivity: 0.1 μ V typical.	At threshold: 0.09 μ V.
Receiver audio output: 2.4 W at 10% THD.	2.5 W at 10% THD into 8 Ω .
Spurious and image rejection: Not specified.	First IF rejection, 110 dB; image rejection, 86 dB.
Transmitter	Transmitter Dynamic Testing
Power output (H/M/ML/L): 65/25/10/5 W (approx).	69 / 26 / 9 / 4 W.
Spurious and harmonic suppression: \geq 60 dB.	70 dB. Meets FCC requirements for spectral purity.
Transmit-receive turnaround time: Not specified.	PTT release to S9 signal, 164 ms, 50% audio output
Receive-transmit turnaround time (tx delay): Not specified.	112 ms.

Size (height, width, depth): 1.6x5.5x5.8 inches; weight, 2.8 pounds.

Note: Unless otherwise noted, all dynamic range measurements are taken at the ARRL Lab standard spacing of 20 kHz.

*Measurement was noise-limited at the value indicators.

sink. With a maximum power output of 65 W and no cooling fan, you'll need this kind of sinking for proper heat dissipation. What's good about this is that you don't have a noisy cooling fan. The flip side is that since the radio's cabinet is used to dissipate heat, extra consideration must be given to where and how the radio is installed in either a mobile or base situation. The manual provides some basic installation tips with this in mind.

This quickly leads me to operating the radio. I tried running it on high power for quite some time (on simplex). The radio got quite warm, but never uncomfortably hot to the touch. It took some time for it to cool down afterwards, perhaps because there was little airflow in my shack at the time.

I reviewed this radio in late summer with popcorn thunderstorms, rain and humidity—welcome to summer in New England! With tropical storm Bonnie and Hurricane Charley knocking on our back door, it should come as no surprise that I

listened with interest to the NOAA weather broadcasts. The '2200H provides coverage of 10 NOAA weather channels with a *weather alert* function (selectable via a menu setting). By depressing the PRIO/M/CALL button several times, you can select the weather group. You can activate the weather alert function by using the SET mode.

This weather alert function is one that many SKYWARN folk may find useful. In the event of an extreme weather situation, NOAA sends out a weather alert that is accompanied by a 1050 Hz tone, and then the weather report. You can set the '2200H to monitor (or scan) the 10 weather channels for this alert tone. If this tone is received, the '2200H will beep, and the display will indicate ALT (for *alert*) and the particular weather channel number.

You also do not need to be listening to a weather channel to receive this alert. You can be in casual QSO, but have the alert system running. However, be advised the '2200H will toggle back and forth about

every 5 seconds between the weather channels and your listening frequency.

Another feature I like is the *Auto Repeater* function. When it is activated (the default is *On*), all you do is set the desired frequency and the radio sets the corresponding shift. (The shift is preset to conform to the accepted band plan of the country in which the radio is sold.) If a repeater has a nonstandard shift, you can disable this function and set the shift manually.

The *Channel Stepping* (tuning rate) is selectable from 5 (default) to 50 kHz in 8 steps via the SET system.

The '2200H provides for direct keypad frequency entry via the mic keypad. You depress the ENT/T-OFF (C) button first, and then you can key in the frequency. This occurs while in VFO mode. If you're in memory mode, you may enter a memory channel number instead of a frequency.

If a selected repeater supports phone patching or remote control of other functions, the 16 number DTMF MEMORY ENCODER can be quite handy. To memorize a DTMF sequence takes a few steps. It took me a couple of tries to get the process just right. The manual does a good job of explaining how to perform the programming and once you perform the actions a couple of times, it'll become second nature to set up.

Frequency Scanning is simple to set up. There are three scan types—full scan, programmed scan and memory bank scan. There are four scan resume options. The two I found most useful were timer scan; with pauses of 5, 10 or 15 seconds until scan resumed, or busy resume in which the scan will hold the frequency until the signal disappears.

To start scanning, you select the scan type and then press and hold the SCAN/V/MHZ button for at least 2 seconds. To stop the scan, you can either quickly depress the mic PTT button, or just depress any of the mic or display buttons. You can also control either scanning direction with the MAIN DIAL.

The IC-2200H has the standard fare of a priority watch function, pocket beep "common pager" function, time-out-timer, auto mute, auto power off. In terms of settings, there are 30 SET menus from which to choose.

A Mic of Many Functions

The DTMF 25-key backlit microphone (model HM-133V) performed as expected. Some microphone buttons can be programmed to operate some of the front panel control functions. I did have to get used to the UP and DOWN buttons being on the front of the microphone. But since they're located next to the PTT button, I

can control the frequency (or any other setting) with just a twitch of the thumb—very handy while driving. Audio reports from this microphone were all good.

So How Did It Perform?

Although it's one thing to receive good signal reports, it's another to actually hear "yourself" and how you sound on a radio. I always swap the radio with another ham so I can hear how well the audio sounds. As I expected, I found the transmit audio to be clean. (Reports from QSOs both on simplex and repeaters told me about the same.)

I used this radio both in my truck and at home. In both cases, I found the receive audio levels to be acceptable. The speaker is mounted underneath the radio, so when it was on my bench I had to prop it up. If this radio were to be mobile-mounted, however, I would see no need for an external speaker—unless the vehicle itself were really noisy.

I tried the old "operating the radio when W1AW came on frequency" while I was in the ARRL HQ parking lot under the antenna. I heard no intermod from W1AW. Yes, the signal appeared a bit wider than normal, but that is to be expected given the power of the ARRL code practice and my location. When I drove around town, I did not experience any other interference.

I could not find any mention of operating packet radio with the basic IC-2200H, although it should be capable of 1200 bps analog packet. Yes, you have the pin out for the microphone, and there is a pin for *Data In*. But I found no discussion about packet radio. With the UT-115 digital module (when available), the radio promises to handle data to 9600 bps and digital voice.

Programming

In general, there are two ways to program a memory channel—by using the display buttons or by the microphone keys. As with most radios, you select your frequency and settings (tones, offset, etc)

first and then you go through the process of assigning that information to a memory channel. It's quite simple, actually. In VFO mode, set the frequency and settings. Depress the S.MW(MW) button momentarily. Then rotate the MAIN DIAL to the desired memory channel, and depress S.MW(MW) again to write the information.

When you're pushing a button to perform a function, there is certainly a difference between the terms "momentary" and "second." So don't be too surprised if you find that a function is missed simply because the "momentary" was a tad longer than it needed to be. But once you get used to it, it's a snap.

Send in the Clones

The IC-2200H can clone configuration data to and from another IC-2200H, or from a PC using the optional CS-2200H software and the optional OPC-478 serial cable. (The OPC-478U is a USB cable.) There is little information in the manual on exactly how to clone. The manual indicates that one should consult the cloning software help file for details.

A Manual, and a Half

The 94 page manual is laid out in a straightforward manner. You begin with *Foreword*, *Precautions*, *Supplied Accessories*, *Index* and then a *Quick Reference Guide* on installation and operation. The operation section starts with the general operation of the radio, including how to set up various functions. The rear of the section is devoted to menu functions and programming.

With the radio package, you also receive a book of *Ham Radio Terms*. This makes a nice little addition to help understand ICOM's terminology, or you may wish to give it to a family member.

What's New but Not Yet Available?

The IC-2200H is the first member of a family of ICOM VHF and UHF radios equipped for the yet to be released UT-115 digital voice and data module. We

were hoping to have the module available for this review, but since it wasn't available we will provide an evaluation later. This module promises direct digital data transmission and digital voice operation simultaneously when used with another UT-115 equipped radio. When that is installed, the DATA JACK on the rear of the radio will be activated and allow connection to either a PC or a GPS receiver with an RS-232C serial port.

In order to install the UT-115, you will need to remove the front panel. It's as simple as removing two screws and the MAIN DIAL knob.

The following are the features expected to be supported when the digital option is installed: digital voice, digital call received retention, digital break-in (allows breaking into digital communications between two other digital mode stations), digital code/call sign squelch, 4800 and 9600 bps data communications (using a PC) and GPS operation.

A Closing Thought

Aside from not being able to play with packet, or with the digital option, I was quite pleased with the performance of this radio. I found I was able to handle many of the settings/menus without difficulty. Of course, not having it so chock-full of the "extra" features of a multiband radio didn't hurt. (Sometimes, too many is *too much!*) I believe that most hams would find that this radio would work fine for just about every application, especially if they wanted to be positioned for digital voice when the option becomes available. Although there are a few functions that some hams may never use, having them available is a selling feature.

Manufacturer: ICOM America, 2380 116th Ave NE, Bellevue, WA 98004; tel 425-454-8155; www.icomamerica.com. Price: IC-2200H, \$229.99; OPC-478 serial programming cable, \$45.99; OPC-478U USB programming cable, \$60.99; UT-108 DTMF decoder, \$35.99.