

Product Review

Icom ID-52A Dual-Band FM/Digital Handheld Transceiver

Reviewed by Steve Ford, WB8IMY
wb8imy@arrl.net

If the Icom ID-52A is striving to become the top-end “luxury” analog FM and D-STAR handheld transceiver, I believe it may have achieved its goal. This radio has a wealth of features that place it near the top of the list, not only for digital D-STAR users, but for FM operators as well.

If you’re tempted to compare the ID-52A to its predecessor, the Icom ID-51A, you will quickly discover that the ID-52A is more than a straightforward replacement. As you’re about to see, the ID-52A has several attributes that set it apart.

One of the first things you’ll notice is the larger color LCD (the display is more than 2 inches diagonally). When you listen for the first time, you’re also likely to notice a major audio output boost compared to the ID-51.

But those are just first-blush impressions. As you handle the radio with the lithium-ion battery attached, the solid construction is obvious. The ID-52A weighs slightly more than 10 ounces and the package includes a battery charger, flexible helical antenna (better known as the proverbial “rubber duck”), and a belt clip. The accompanying instruction manual is professionally written and provides most of what you need to know, although you will need to download additional documentation from the Icom website if you want to explore advanced features.

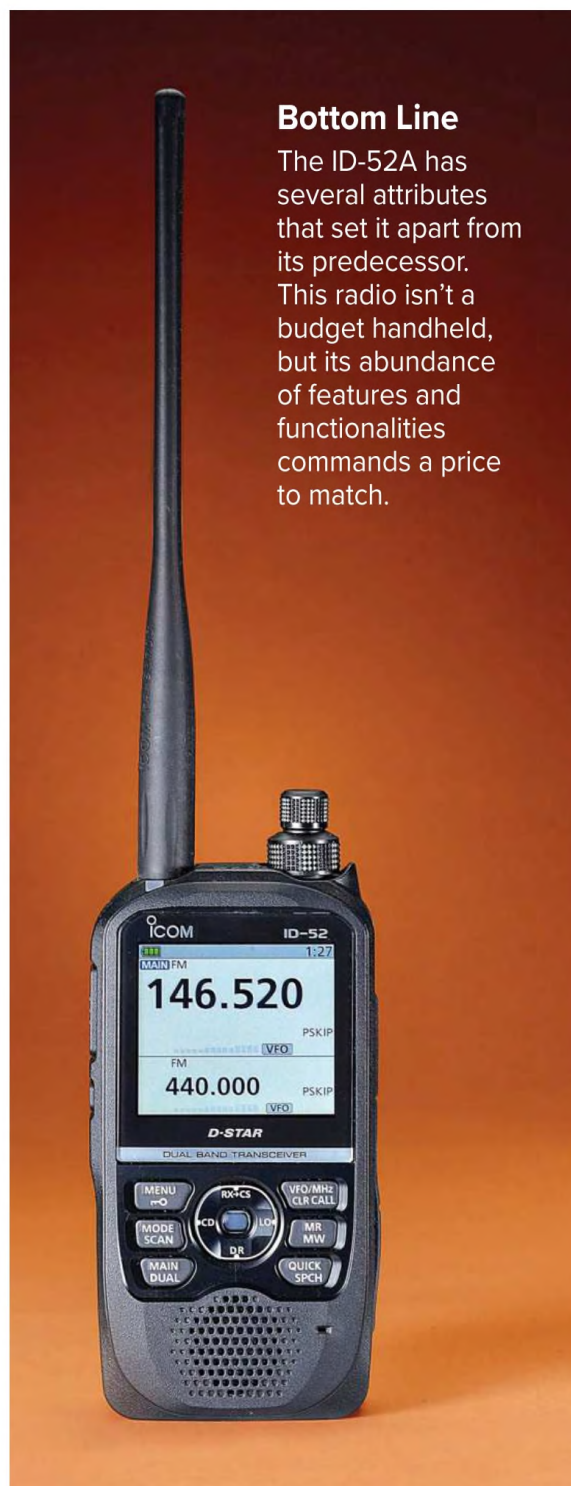
When it comes to reception, the ID-52A spans 88 to 174 MHz and 225 to 479 MHz. This range includes FM broadcast (monaural only) and AM aeronautical coverage. It excelled at both, although I had to occasionally use the attenuator function to mitigate overload from nearby FM stations.

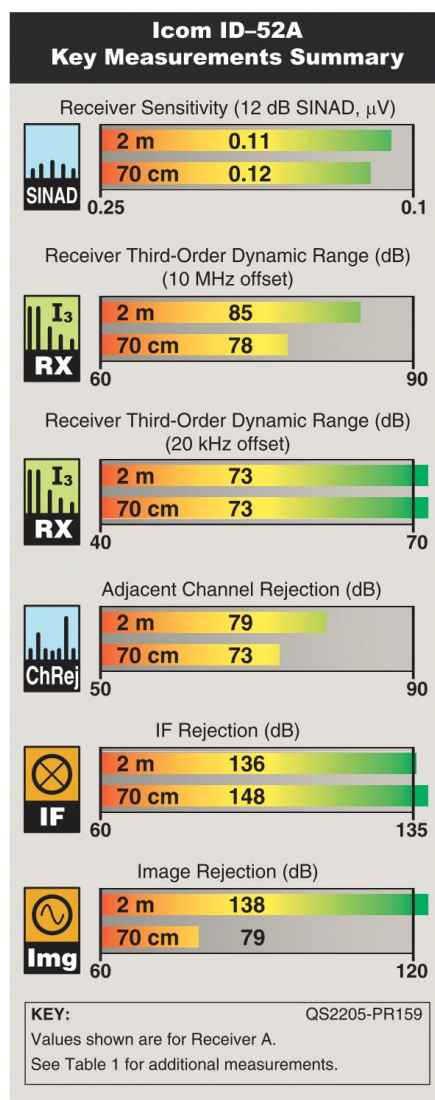
On the transmit side, the ID-52A offers more RF output levels than I can recall seeing in a handheld transceiver: 5 W (High), 2.5 W (Mid), 1.0 W (Low2), 0.5 W (Low1), and a mere 0.1 W (S-low). Even at 100 mW output, I had little difficulty reaching local repeaters. It probably goes without saying that I enjoyed considerable battery life at that output level.

Other standard-equipment goodies include Bluetooth wireless connectivity, a Global Positioning System (GPS) receiver, a microSD memory card slot, a USB port, and 1,000 receive/transmit memories (along with memories set aside for your favorite FM broadcast stations).

Bottom Line

The ID-52A has several attributes that set it apart from its predecessor. This radio isn’t a budget handheld, but its abundance of features and functionalities commands a price to match.





The radio carries an IPX7 rating, which means that if you drop your ID-52A in a body of water less than a meter deep, you have at least 30 minutes to retrieve it before damage occurs. Rather than test the rating, I chose to take Icom's word for it.

Powering Up

Despite its overall ruggedness, the ID-52A has a comfortable ergonomic feel. I never found myself fumbling to access the controls, and the central navigation and selection button was simple to use.

A long press of the power button on the side of the radio brings the ID-52A to life after a slight delay of a second or so. The LCD screen is

Table 1

Icom ID-52A, serial number 150001808

Manufacturer's Specifications

General

Operating modes:
FM/FM-N, AM/AM-N,¹ DV (GMSK),
FM broadcast band (WFM)

Power requirements:
10 V dc – 16 V dc external supply
7.4 V dc with specified Icom battery pack
5.5 V dc with specified Icom battery case

Current drain (at 7.4 V dc):
Transmit (at 5 W): <2.5 A

Receive (max audio output, 8 Ω load)
FM/FM-N, <400 mA

Digital Voice (DV), <450 mA

Receiver

Receive frequency coverage:³
A Band:
108 – 174 MHz, 225 – 479 MHz
B Band:
137 – 174 MHz, 375 – 479 MHz
FM Broadcast Band:
76 – 108 MHz

Receiver Sensitivity:
A Band FM/FM-N, 12 dB SINAD:
137 – 174 MHz: <0.32 μV
225 – 259.995 MHz: <0.56 μV
260 – 479 MHz: <0.32 μV

A Band AM/AM-N, 10 dB S/N:
108 – 142 MHz: <1 μV
225 – 259.995 MHz: <1.8 μV
260 – 374.995 MHz: <1 μV

B Band, FM/FM-N, 12 dB SINAD:
137 – 174 MHz: <0.32 μV
375 – 399.995 MHz: <0.32 μV
400 – 479 MHz: <0.32 μV

FM Broadcast Band (WFM), 12 dB SINAD:
88 – 108 MHz: <1.8 μV

FM two-tone, third-order IMD dynamic range: Not specified.

Measured in ARRL Lab

As specified.

As specified.

Measured at 12.6 V dc,² 146 MHz
High, 1.16 A; Med, 0.85 A; Low1, 0.49 A;
Low2, 0.6 A, S-Low, 0.34 A.
Measured at 12 V dc, 440 MHz
High 1.38 A; Med, 1 A; Low1, 0.53 A;
Low2, 0.69 A, S-Low, 0.35 A.
Current drain from internal battery not measured.

Measured at 12.6 V dc, 146 MHz and 445 MHz.
S9 modulated signal, lights on, one receiver on, 0.26 A.
No signal, lights on, both receivers on, 0.29 A.

As specified.

As specified.

As specified.

146 MHz, A and B band:
FM, –125 dBm (0.12 μV)
146 MHz, A and B band:
FM-N, –126 dBm (0.11 μV)
162.4 MHz, A and B band:
FM, –125 dBm, (0.12 μV)
164.2 MHz, A and B band:
FM-N, –126 dBm (0.11 μV)
445 MHz, A and B band:
FM, –124 dBm (0.14 μV)
445 MHz, A and B band:
FM-N, –125 dBm (0.12 μV)
120 MHz, A band:
–127 dBm (0.1 μV)

As measured for A band on 146 MHz and 445 MHz.

100 MHz, 1.0 μV

A Band, 20 kHz offset:
146 MHz: FM, 71 dB; FM-N, 73 dB
445 MHz: FM, 74 dB; FM-N, 73 dB
A Band, 10 MHz offset:
146 MHz: FM, 85 dB; FM-N, 85 dB
445 MHz: FM, 77 dB; FM-N, 78 dB
B Band, 20 kHz offset:
146 MHz: FM, 72 dB; FM-N, 71 dB
440 MHz: FM, 70 dB; FM-N, 71 dB
B Band, FM, 10 MHz offset:
146 MHz: FM, 83 dB; FM-N, 84 dB
440 MHz: FM, 75 dB; FM-N, 75 dB

Manufacturer's Specifications

FM two-tone, second-order IMD dynamic range: Not specified.

Adjacent-channel rejection:

FM: >50 dB

FM-N, DV: >55 dB

IF rejection: Not specified.

Image rejection: Not specified.

Squelch sensitivity: Not specified.

146 MHz, 0.36 μ V (min), 1.41 μ V (max)

S-meter sensitivity: Not specified.

146 MHz, 1.38 μ V

Audio output into 8 Ω

Internal speaker: 0.75 W at 10% THD

External speaker: 0.2 W at 10% THD

Transmitters

Transmit frequency coverage:

144-148 MHz; 430-450 MHz

Power output at 7.4 V dc:

High, 5 W; Mid, 2.5 W; Low2, 1 W

Low1, 0.5 W; S-Low, 0.1 W.

Spurious signal and harmonic suppression:

<-60 dBc (High/Mid)

<-13 dBm (Low2, Low1, S-Low)

Transmit-receive turnaround time

(PTT release to 50% of full audio output):

Not specified.

Receive-transmit turnaround time

(TX delay): Not specified.

Size (height, width, depth): 4.8 $\times$ 2.4 $\times$ 1.2 inches (excluding protrusions).

Antenna length: 7 inches. Weight: 12 ounces (with battery and antenna).

¹Receive only

²External voltage specified as 10 V dc – 16 V dc

³A and B band frequency coverage and specifications guaranteed only between 144 – 148 MHz and 440 – 450 MHz

⁴Measurements phase-noise limited at values shown

⁵Power output did not vary significantly with external voltage from 10 V dc to 16 V dc, or with use of a fully charged internal battery

Measured in ARRL Lab

A band, FM:

146 MHz: 55.2/90.82 MHz test tones,

88 dB

440 MHz: 146.02/300MHz test tones,

114 dB

A band, FM, 20 kHz offset:⁴

146 MHz, 78 dB; 445 MHz, 72 dB

A band, FM-N, 20 kHz offset:

146 MHz, 79 dB, 445 MHz, 73 dB

A band, FM:

146 MHz, 136 dB

445 MHz, 148 dB

B band, FM:

146 MHz, 138 dB

445 MHz, 143 dB

A and B band:

146 MHz, >138 dB

445 MHz, 79 dB

A and B band:

445 MHz, 0.2 μ V (min), 0.93 μ V (max)

A band, 10-bar indication:

440 MHz, 0.82 μ V

B band, 10-bar indication:

146 MHz, 1.64 μ V

440 MHz, 1.16 μ V

Not measured

0.26 W at 10% THD

0.22 W at 1% THD

As specified.

Battery power (8.4 V dc) or 12.6 V dc external power:⁵

146 MHz:

Hi: 5.13 W; Med, 2.64 W; Low2, 1.05 W

Low1, 0.55 W; S-Slow, 0.11 W

440 MHz:

Hi: 4.92 W; Med, 2.44 W; Low2, 1.05 W

Low1, 0.5 W; S-Low, 0.11 W

Meets FCC requirements:

146 MHz: <-70 dBc

445 MHz: -68 dBc

Band A and B, Squelch on, S-9 signal:

144 MHz: 94 ms

440 MHz: 95 ms

Band A and B:

146 MHz: 69 ms

440 MHz: 69 ms

bright and colorful, and I appreciated the icons Icom provides to enhance the menu screen (see Figure 1). I should mention that the ID-52A is not a touchscreen radio; you must browse the menu and make selections using the navigation button, much in the same way you'd use a computer mouse.

As with most dual-band handhelds, you can toggle the display to show both bands or just a single band. The dual watch feature allows monitoring of two frequencies or bands simultaneously. You can listen to two UHF signals, two VHF signals, or VHF/UHF simultaneously. You can even monitor two D-STAR DV signals at the same time, which is a novel addition to the ID-52A compared to its predecessor.

The screen also gives you the option to view band activity in a colorful waterfall display. This is the first handheld radio I've seen that offered this type of display technology. Your receive frequency is represented by a red line and multicolored bars indicate activity on either side of that frequency (see Figure 2).

Bluetooth

I used the ID-52A to pair my wireless Bluetooth headset and the setup worked perfectly. Sound quality was excellent in both receive and transmit. The specified range is about 30 feet, but during one test I was wandering in the back yard at a distance of about 40 to 50 feet. Even at this distance, the connection remained stable with no dropouts.

If you own an Android or Apple mobile device, you can install the *RS-MS1* remote control software from Google Play or the Apple App Store and use the Bluetooth connection to do all sorts of clever things with the ID-52A, such as send text messages in the D-STAR mode, swap small images, and more (see Figure 3).



Figure 1 — The landing page of the ID-52A's main menu uses icons to help you locate the areas you want to access.



Figure 2 — The ID-52A's color waterfall display is a unique feature. Your receive frequency is indicated by the red line.

You can even record entire on-air conversations for later listening — through the radio or through your computer. This is a good reason to purchase a card with substantial capacity.

D-STAR

Of course, D-STAR — Digital Smart Technologies for Amateur Radio — is one of the chief reasons to consider the ID-52A. If you're not familiar with D-STAR, the short story is that it is a digital communication protocol developed in a joint venture between

Icom and the Japan Amateur Radio League in the late 1990s. In the nearly 25 years since its introduction, D-STAR has spread throughout the world with thousands of repeater systems, many of which also function as gateways to the global D-STAR network via internet linking.

Its compact size notwithstanding, the ID-52A is a full-featured D-STAR transceiver. It is so feature rich that I soon found myself downloading the Advanced manual from the Icom website. The transceiver has too many functions to adequately address in the printed manual supplied with the radio, so I'd highly recommend grabbing a copy of the Advanced manual.

Thanks to the built-in GPS receiver and the extensive repeater list stored in the ID-52A's memory, finding a nearby D-STAR repeater took about 30 seconds. As soon as the GPS receiver acquires a sufficient number of satellites (when the GPS icon on the screen stops blinking), you can use the DR function to display all D-STAR repeaters within a given distance. At the top of my list was a repeater within less than 10 miles of my home. I selected the repeater, and I was instantly ready to communicate. (You can also use the list to search for analog FM repeaters.)

During my conversations, D-STAR's performance was flawless. Even the audio quality seemed improved compared to what I remembered several years ago. In many instances, when I established contact the screen would briefly display the location information of the other station.

The repeater I was using had a gateway to the D-STAR network, so I was able to enjoy a few chats with amateurs thousands of miles away. To use a D-STAR gateway, however, your call sign must be registered on the D-STAR network.

If you have a Windows device such as a Surface tablet, it may be possible to use the *RS-MS1A* software with an Android emulator such as Bluestacks (www.bluestacks.com), but I didn't attempt this.

Memory Programming

While you can certainly program the ID-52A's memory channels manually, I found it far easier to simply connect a USB cable between the radio and my computer and accomplish the task in software. Icom offers a free programming application for Windows called CS-52 that you can download from their website. With CS-52 you can add, edit, and delete memory channels through an easy-to-use interface.

And not only can you program the radio via USB, you can charge the ID-52A's battery that way as well. Before you attempt a USB connection, however, you'll need to download and install the Icom USB driver software.

If you'd prefer not to program via USB, you can also dump the radio's memory contents to a microSD card, transfer the microSD card to your computer via a card reader/writer, and then use CS-52 to manipulate the data in that fashion. Of course, you must write everything back to the card, plug the card back into the ID-52A, and then load the new information from the card. I tried both methods and found the USB connection to be far more convenient.

Icom doesn't include a USB cable with the ID-52A, but it is just a standard micro-USB model you can find almost anywhere. The same is true for the microSD card; Icom doesn't supply one, but these cards are commonly available and inexpensive.

When it comes to data, the ID-52A can record and store much more than memory channels. You can pre-record voice messages and transmit them on demand.

If you are not already registered, you can register using the website <https://regist.dstargateway.org>. There you will also find a link with instructions, as well as a video to help you through the process. When the registration is completed, usually within 24 hours, you can use the same web page to verify your registration, this will also provide the gateway to use with the ID-52A when in Access Point Terminal mode.

But what if you don't have a nearby D-STAR repeater? With the ID-52A you can still access the D-STAR network by connecting the radio to your computer and using it in "terminal" mode in conjunction with Icom's RS-MS3W software and your home internet connection. The ID-52A can also function as an access point to allow other D-STAR radios to reach the network.

Although the ID-52A can be used with any external hotspot that is compatible with D-STAR, the Access Point Terminal Mode with the radio can only access the Icom G3 Gateway Software repeaters, and reflectors that are supported by the *ircDDB* gateway software.

The RS-MS3W software has its own manual, but the Advanced manual supplies most of the information. Setup is not particularly intuitive, so it helps if you know your way around computers and networks. For instance, depending on the type of network router you own, you may have to configure it to open a port RS-MS3W can use to reach the internet. While the setup process can be challenging, once you have it up and running, you'll be able to use your ID-52A to enjoy conversations with other hams throughout the network. In terminal mode the radio is physically tethered to the computer through the USB cable and does not transmit RF, but in access point mode the ID-52A functions as an RF "hotspot" that can be accessed with other D-STAR transceivers.

And then there is D-PRS. You might say D-PRS is the D-STAR implementation of the Automatic Packet Reporting System, or APRS. However, unlike APRS, D-PRS is not a protocol but a conversion specification.



Figure 3 — If you own an Android or Apple mobile device, the RS-MS1 remote control software will use the ID-52A's wireless Bluetooth connection to do all sorts of clever things, such as exchange text messages in the D-STAR mode.

When you're operating in the D-STAR digital voice mode (DV), the 4800 bps data stream devotes about 3600 bps to voice information. The remaining 1200 bps is used for synchronization and user-defined capabilities. Icom made use of this user-defined space to pass radio messages (simple display messages) and serial data.

Icom placed GPS position information in the serial data. They designed D-PRS to take this GPS information and make it presentable to the APRS world. D-PRS removes the need for designing special-purpose mapping software just for the unique Icom GPS data stream. If you really want to dig deeply into how D-PRS works, read the paper by Peter Loveall, AE5PL, at www.aprs-is.net/images/D-PRS.pdf.

In the ID-52A, D-PRS has quite a few functions worth trying. One of my favorites is the ability to establish an area around the location of another D-STAR user that triggers a notice whenever he or she travels beyond that location. This could be valuable for public service applications.

The ID-52A also has the ability to use the Near Me Repeater function of the DR Mode for both D-STAR and FM repeaters. You can update your list from www.dstarinfo.com and create your own custom list. So, if you're traveling in the region where you don't know the local repeaters, this is very useful to scan the closest repeater to your position. This scan list is automatically updated using your current position to identify the in-range repeaters.

A Highly Capable Handheld

The ID-52A isn't a budget handheld; this abundance of features and functionalities commands a price to match. But if you want to join the D-STAR community, either through a local repeater or a terminal/access connection, the ID-52A has everything you'll need to make it happen. The same is true for analog FM. With the ID-52A you are in the enviable position of being able to easily enjoy the best of both worlds.

Manufacturer: Icom America; 12421 Willows Road NE, Kirkland, WA, 98034; www.icomamerica.com.