



The ICOM IC-7600

Reviewed by Matt Erickson, KK5DR

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Successor to the highly-successful IC-756ProIII, the 7600 signals an end of an era. The 756 series is now history, a history of great performance and evolving technology in the ICOM name and the amateur radio hobby.

Since I am not one who lives or dies “by the numbers”, I will spend the remaining of this article telling the reader how the 7600 performs on the air. Using my vast experience with gear I have used in the past (some of which I currently own), I will compare the 7600 to that history. First, a little background: I owned a 756ProIII for two years, and was well pleased with its performance, but always knew that there is more performance that could be stuffed into the same size cabinet. I have also owned the 7800 and the 7700. I still have the 7700, which will allow me to compare it closely to the 7600.

So, what makes the 7600 better than a 756ProIII ? That is the question that most of the readers will be asking themselves. I could give all the facts of how the DSP speed has been vastly improved, or I could say that the 7600 has three “roofing” filters, whereas the ProIII only has one. Then we know that the NB is now fully digital in the 7600, where in the ProIII it is still an analog system with severe limitations.

For those who like computer control of the radio and digital modes, the 7600 has a treat for you. The computer control is fully through a USB port on the rear panel of the radio. Install the ICOM USB driver, which can be downloaded from the [website](#), and you are on the air. No level converter interface is needed; all signals are through the USB cable, which makes for a very simple and neat installation. The radio has been tested with Ham Radio Deluxe, and works perfectly, but other programs may or may not work with this method of interface at the time of publishing this article.

As I mentioned earlier, the cabinet of the 7600 is nearly the same as that of the ProIII; its weight is about the same too. The radio has a built-in ATU and runs 100 watts output HF/50MHz. There is no built-in PSU in the 7600; you will need to provide one that can support at least 22A full load. Sorry, but the older ICOM PS-125 PSU cannot be used directly with the 7600 because its power connector is 6-pin, whereas that of the 7600 is 4-pin. Aftermarket adapter cables are available; perhaps ICOM will offer a similar adapter at a later time. The ICOM PSU that will connect is the PS-126, which differs only in the DC power connector area from the PS-125.

The radio comes with a mobile DC power cable, which most users will be able to interface with common PSUs equipped with output binding posts. It is possible to use the supplied cable and modify the PS-125 to use it, but that would require opening up the PSU and removing the existing cable and installing the supplied cable semi-permanently on the PS-125. I'm not telling the reader how to do it, but telling you it is possible. In my station, I use a nice little MFJ-4125 switcher, which I have used for years and find totally RF quiet. I have never had a moment's trouble with one.

One of the first things a user will notice when first looking at the front panel of the 7600 is that analog meter that was once separate from the main display, is now part of the main display. It will quite likely fool many "old timers", but the meter is a fully digital video emulation of an analog meter. The screen itself is slightly larger than the one on the ProIII, but only by 0.8"

Sorry, there is no video output for the main display to be sent to an external monitor. You will have to step up to the 7700 to get that feature.

Enough about the things one can see in a sales brochure, it is time to tell the reader about how this radio operates on the air, and how the features work.

Basic receiver audio:

The set-up for this is to tune the radio to a given band and set it to no pre-amp, no NB, no NR, and listen to the band noise and audio reproduction of signals. I compared the 7600 to the 7700, which is used as performance benchmark for this review and is well known for its high level of receiver performance. All settings were duplicated on both units. A hybrid combiner was used to couple both units to the same antenna at the same time. This is what I heard:

It is very difficult to say that one radio is clearly better than the other. From what I can hear, there is very little difference between the two receivers. If I had to pick one, I would say that the 7700 audio response is slightly smoother, but only by the tiniest of margins. The observer must really concentrate hard to hear this difference. Listening closely in a set of good headphones, it is hard to pick the superior receiver. I tuned both radios around various bands listening to various signals, also tuning off of some very strong signals to see how each unit responded to close-in interference from these stations. Both units responded exactly the same. As far as I am concerned, the 7600 basic receiver performance is just as good as that of the 7700.

NB/NR performance:

I tested the Noise Blanking of both units in the same manner as I did basic receiver testing. I tested them on the same on-air noise source. Both NB systems are very effective, with very little distortion, as long as the levels of noise blanking are kept to the minimum levels required to reduce the noise impulses to a tolerable level. Strong signals within the band will create modulated distortions in the receiver, but not nearly as severely as the older analog NB systems did. Clearly the advantage is to do noise blanking within the digital domain. The 7600 did require a very slightly increased level of noise blanking to get the same level of impulse reduction. The increase was very small, less than one increment.

Noise Reduction, as in "random" noise reduction, was very much the same as NB testing. The 7600 did require less than half an increment increase in level to produce the same level of reduction as the 7700.

"Roofing" filters and shaping:

I examined the "roofing filter" system of the 7600, which is nearly identical to that of the 7700. The ability to switch in narrow roofing filters should allow operation in very crowded band conditions, but only as long as the offending signals fall outside the filter band-width. Those offending signals that fall inside the filter bandwidth will have to be dealt with by using the Twin Pass-band tuning system, which is very effective at doing this. It is amazing how weak signals can be extracted from the interference that would render lesser radios helpless. The system of roofing filters is so well designed in both the 7600 and 7700, that I see virtually no difference between them, at least none that the average ham will be able to detect. The ability to select IF filter shape factors such as "Soft" and "Sharp" is a nice feature; many users that have never used such a system will like this feature. Certain modes are better used with an alternate filter shape, which leads to less user fatigue. What shape you use on a given mode is up to you, whatever makes you a less fatigued operator.

TX audio:

Getting good sounding transmit audio from the 7600 is a piece of cake. I listened to myself on the 7700, made a couple adjustments in the bass, treble, and that part was done, next I set up the compression system. Turn on the <Comp Wide>

and press and hold for one second the same button and up pops the compression menu. I found it to have more than enough drive and gain for my Heil PR-781 mic. The default drive gain setting of 50% was good enough, and I reduced the compression level to < 2 > on the scale and this produced about 5-6dB of compression, which is perfect.

ALC action is just where it should be, 50-75% of the ALC scale for full 100 watts PEP output on SSB. Oh, by the way, the drive gain interacts with compression level, but only on SSB. In all other modes compression is disabled, and drive gain acts as an RF output level control, which allows the ALC to remain calibrated for whatever RF output the operator wishes to set. With drive gain set to 50% and RF power out set to full, 100 watts of RF output will produce an ALC indication that is calibrated for that level of RF out. For lower levels of RF output, the drive gain will need to be adjusted to keep the meter calibrated for that given level.

I got all the on-air reports on the 7600 from persons who know what I sound like, said that it sounded just like my 7700. Had I not told them that I was using the 7600, they would not have known it was not my 7700. Reports stated that the TX audio is natural sounding, as if I were speaking to them in person. This is my goal as far as TX audio goes under good band conditions; however, under poor to marginal band conditions, I have preset the **mid** and **nar** settings for just such needs. The press of a button changes the TX audio to suit the conditions at hand. Versatility, is the name of game when it comes to TX audio. Fast adaptation to band conditions will get those contacts for you.

I measured the SSB RF output with an Array Solutions Power Master, which is one of the most accurate RF power meters on the market today, and it peaked at 98 watts out on SSB, which also accounts for the error factor of the meter. Key-down modes like CW, FM RTTY are 100+ watts out.

CW:

Previously in this article most of my testing was done in SSB mode. Since I am a casual CW operator, I did test the unit on CW. I found the 7600 to be very good on CW; the filters are easy to use and can be configured quickly and effectively. I heard very little “ringing” in the filters at narrow settings below 500Hz. The APF works nicely and can be used along with narrow DSP filters to great effect, the APF should only be used with narrow DSP filter selections under 500Hz, filters wider than this will result in poor APF operation. The “Auto-tune” feature is a feature that came over from the 7700; it makes tuning in the CW signals to perfect zero-beat a breeze. Just tune close to a CW signal you wish to zero, hit the Auto-tune button and very quickly the radio tunes itself to perfect zero-beat on that signal. Amazing! With such a fine array of CW features, nobody need be afraid to dive into the CW bands and hammer some brass. With all the features at your fingertips you will find, as I did, that CW on the 7600 is pure pleasure. It is almost too easy... Full QSK is “as fast as you can think”, very fast with only slight truncation of lead characters but only at speeds above 30WPM. Here are additional [CW comments](#) and [observations](#) I made on the 7600 more recently.

AGC:

The AGC system in the 7600 is very well behaved, and can easily be configured by the user to suit your style of operation. Press and hold the AGC button for one second and up pops the AGC decay timing menu which the user can select three ranges of fast, mid, slow, each having its own timing range. I needed to make only a small adjustment to find a setting that suited me perfectly. Each mode has settings specifically for that mode. Once set, you can forget them. Adjustable AGC timing will help the user deal with difficult conditions.

Heat:

I found that the cabinet of the 7600 stays fairly cool, even after a period of transmitting. The display area is much cooler than that of the 756ProIII. Even after long periods of receiving, the cabinet remains slightly above room temp. If you are from the days of old, when radios put out a lot of heat, you might actually like the warmth of touching the 7600 cabinet, a little reminiscent of those old days. The warm body of the 7600 makes you feel it is alive. If the heat were not conducted to the outer surface of the 7600, there would have to be a ripping loud fan inside to remove it. No need to worry about the radio overheating; as long as you give it enough room all around the outside for natural air movement, it isn't going to happen. The cooling system has a long history with ICOM and [long before that](#) too. In the entire history of the 756 series (which uses the same system), there were only a few cases of overheating, but these were attributable to the user placing the radio in an enclosed space that did not allow enough free air-flow.

Display:

The display is the center of operation on the 7600, it is larger than the 756ProIII, but I am a little disappointed in the resolution of the screen. It seems a bit “grainy” to me. It is very bright, and easy to read, I would have liked to have seen a much sharper image than there is. Oh well, we can have everything in one radio. I did find that if you sit back a few feet from the screen the “graininess” goes away.

Screen and scope:

The spectrum scope is capable of doing basically everything that the 7700 scope can do. The user can adjust the colors of the active sweep, and well as the peak hold sweep in the background. The speed of the sweep can be selected. The limits of the band can be selected in the menu for use in “fixed” mode. The ProIII is limited to “centered” mode wherein the center of the sweep is fixed to the tuned frequency. The Fixed mode of the 7600 allows the tuned frequency to move within the limits of the band selected by the user. I noticed that the scope markers move in small increments of 300Hz, the user will only notice this when tuning a band very slowly with the marker turned on. The markers on the 7700 do the same thing. For the PSK/RTTY user the decode function brings up a nice little “waterfall” display and a vector tune indicator, which greatly helps tuning a signal for decoding. All decoding of PSK-31 and standard RTTY signals can be read on the screen, as well as encoding of sent messages via an attached USB keyboard.

PSK-31 & RTTY, with no PC:

One of the features of the 7600 is the USB ports on the front and back panels. I used a mini keyboard with my 7700 to do “stand-alone” PSK-31 and RTTY. This can also be done with the 7600. I tried it out and it works perfectly; the received signal decodes on the screen of the radio, and the outgoing encoded message is input with the USB keyboard plugged into the front or rear USB ports. There are also TX memories so standard messages can be sent at the touch of an F-key. A built-in “waterfall” display and vector tune indicators really help tuning in the PSK signals.

ATU:

The automatic tuning unit works like most ICOM ATUs do, FAST! It easily tames my only slightly unruly SWR. It quickly matched it to a 1:1 SWR in the blink of an eye. One must remember that the ATU is not designed to match an SWR of more than 3:1. It is meant to match only “minor” SWR mismatches. The ATU can help with an amplifier that has an input network that is slightly “off”. It can also help with a narrow bandwidth antenna when the user is operating at the edge of its band.

Dual watch:

The dual watch feature is one of the feature items that many users may require for their style of operation. This is not present in the 7700, but is in the 7600, and operates much the same as it did in the 756ProIII. There are limitations to what the dual watch system can do, but for some it can be the feature that is most desired.

Power hog? :

The 7600 is what I might call a “power hog” in regards to its consumption of DC current. I did some testing at various RF power output levels as compared to the DC current input levels. At 100 watts output the total DC current input is about 21A. on my unit. The standing DC input is 4-5A. at zero RF output when keyed for transmit. The DC input was least at 900mW of RF output, but still nearly 7A. If one is thinking of using this radio for remote location operation such as portable Field Day type of operating, bring lots of big batteries, because at this rate of DC input the 7600 is going to suck them dry in very short order. Ongoing charging would be needed to keep this from happening even at the lowest of RF output levels. If you are a QRP battery type operator, the 7600 may not be the radio for you. If you use a generator or AC mains power at all times, then it would work fine.

Overall performance:

Generally, I found that all the features and controls worked just as advertised. This is something I have come to expect from ICOM. If you told me that I could get performance that is as good, or very close to that of the IC-7700 at 2/3rds the price, I would certainly buy that radio, and that radio is the 7600. Appearance-wise, the 7600 looks like the 7700’s little brother. Performance-wise they are nearly the same, with certain areas where the cost differential becomes evident. Most users will never encounter such conditions that the slight performance edge of which the 7700 provides will be required. Some operators will want that edge, others will not miss much using the 7600 and saving a bit of money.

Conclusion:

Simple to operate, easy to use, and works very well, describes the 7600. That is the 7600 in one sentence. If you are the type of ham who likes the best in performance, but have a budget restriction that does not allow you to go to the 7700's price level, the answer to your needs is the 7600. My purpose for purchasing a 7600 was to fill a secondary HF station spot in my radio room, my primary HF station is still a 7700, but now the 7600 gives me basically the same performance level in my secondary station as I get from my primary station.

The average reader of this article may likely own a 756ProIII currently, and is asking the question; "Is there enough of an improvement in performance to make me spend the addition money for a 7600?" I would say that since the 7700 has been shown to clearly outperform the ProIII in many areas, this would mean that the 7600 would outperform the ProIII as well. Is this enough to entice a ham to buy it? That is a question that only the guy doing the buying can answer. Each of us has our personal reasons for making ham radio purchases, some base it in how the radio looks, or makes them feel, others are more analytical and use performance benchmarks to base a purchase on. Personally, I base my purchases in many things; I am more analytical than most and use that to a greater extent, but I also look at ICOM's past reliability in my station and their stellar performance record. As long as ICOM continues to push the edge of radio performance and reliability, I will continue to be a customer. The 7600 is a very powerful radio instrument and proves again that ICOM delivers performance and reliability in one easy to use package. The answer to the previous question is a big YES, the 7600 is worth the purchase over a ProIII, however there is one caveat, if the user has a poor antenna installation such as a compromised multi-band antenna at very low height, the user will not benefit from the 7600 much. The answer in this situation would be to save money, get a ProIII and put more money into the antenna system at greater height, then at a later date get the 7600. Even the very best radio is not going to perform to its full potential on a severely compromised antenna system, i.e. a lossy antenna set at heights below 50 feet. If you do have a first rate antenna system, then get yourself a 7600 and reap the rewards of one of the finest radios you can get today.

Comparing the 7600 to the 756ProIII & others:

My friend Adam VA7OJ has prepared a nice comparison [list](#) of the features for the 7600, ProIII and a few other ICOM models. If you are interested in seeing the differences between the various models, please click on the [link](#).

For a much more technical review, please read my friend Adam's [7600 review](#).

My thanks to Adam for his assistance in editing of this article and all the other work he has done on the 7600 project.