

The ICOM IC-775DSP (revisited)



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Review unit serial number; 011xx

You may ask "why?" QST has already done a review of the IC-775DSP, and it is for that very reason I feel a new perspective is needed. After I read the January 1996 QST review, I see the same "cookie cutter" style of writing reviews. This is a style that is designed to appeal to the lowest common denominator in ham radio. A large portion of the article is dedicated to stating the obvious, wasting the reader's time and insulting his/her intelligence with words of little substance. What are they doing? Filling space? Are the writers paid by the word?

I take a different approach to reviewing a rig. Getting deeper into the operations, feel construction, comparative observations, etc. Things that QST only gives a paragraph or two on.

I spend very little time describing things that can more easily be seen in a photo or found on an ICOM info pamphlet.

My goal in my review is to expose capabilities and shortcomings, then let the reader make their own judgment.

Outside appearance

Big black box. Very nice finish, light rough texture, thick paint coat, that resists scuffs that might bring a new owner to tears.

Real rubber feet, with tilt-back angle feet that flip down in front, good grip on your highly polished operating bench. Rubber rings on the main & sub VFO knobs. The main knob having a nice "spinning" finger cup on it, for "high speed" tuning.

The back end has very few protrusions, and a well-spaced and laid-out connector set. Only one exposed fan back here, on the tuner section.

Big Bright display! Even on its lowest setting, in a darkened shack, I can read the paper by the light cast from it. This display is intense! Perhaps a little more adjustment range was in order.

Big rig, Big fingers.

In the age of the "Incredible shrinking radio", guys like me are happy to see a truly big rig again.

A rig of this size can have control buttons and knobs that are noticeably larger and spaced apart more. This makes it easier to make adjustments and quick changes in operation, without bumping other settings, inadvertently.

I am a fan of the "Big Rig" and hope it never goes away.

Analog meter.

Yes, this is the way many of us "grew-up" with these meters, learned how to read them, and know what certain deflections mean on them. The IC-775 has all the needed scales, and a very accurate action.

Bar graphs be damned!

What? NO HANDLES!!

No handle on the 775, it suffers from the same sickness as the FT-1000, large size, but nothing to grab, when you move the rig. Rack type handles are sold as an option, but I m

used to the old strap type on one of the sides of the rig. Better to carry it like a suitcase, than a bushel-basket.

Big knob, little knob.

Nice large "main" VFO knob, but unfortunately it has very little weighted "fly-wheel effect" in it. I would have preferred a nice "feel" like that of the IC-765. Now that was a VFO knob, one could love. It had a silky smooth, heavy weighted action, and a fly-wheel spin that could go for days after a flick of the fingers.

The knob on the review unit seemed a bit stiff, even with the "brake" all the way off. But, I guess you could say I m "nit-pickin".

Sub VFO knob.

Aww, look at the cute little knob, how cute you are. As for usefulness, I m not so sure of that. It seems to me that this knob is more of a "novelty"(ala FT-1000). It s function could have much more efficiently been done by the placement of a button to switch from main to sub VFO near the main knob, that could have allowed tuning of main or sub from the main knob, with one hand, or even a "slave" tune function. As it is, you would need both hands to "slave" tune both knobs.

The sub VFO knob is clearly a "bells & whistles" feature, meant to grab the attention of those easily impressed by these types of "trinkets". In practical operations, the majority of us, will see little use in it. *Update;* After using the sub-VFO knob, I have seen a use for it. It is less of a "bell & whistles" feature than I first thought.

That s pretty much it for the outside of the IC-775. All the other features on the exterior can be seen in a photo, and would be tediously boring to try to describe here. If you want to see what it looks like, send for a 775 info sheet. It s a full color fold-out that has a lot of good photo views, and tons of info on it, best part is that it s free from ICOM or your favorite dealer.

Under the hood

Impressive! Truly fine construction, lots, and lots of heat sink material, practically all of the rig s chassis is cast aluminum and used for heat sinking. From the top view, the largest feature is the massive power amp block, near the middle of the chassis. Looks like a huge cast aluminum brick, with a fan on the inside end, and a small protruding heat sink fin area in the back of the rig where the warm air exits. To the left of the PA, is the equally impressive power supply. A large "computer" type, switching PS, with a very quiet, continuously running fan on it So quiet is this fan, that you are hard pressed to know it even runs. Well done ICOM!

Over on the right side of the rig, lays the tuner section, nicely set up, with a fan of it s own. I wondered at first, why, but then I realized that the tuner components are a little

small to handle the 200 watts of PA output, with out the help of the fan to keep these parts cool and efficient; a thoughtful engineering design. This will add to the reliability of the rig under less-than-optimum operating conditions (such as a bad antenna match).

The under side of the rig is where most of the control & operation circuit boards are located. This section is laid out in an efficient manner, very high quality boards, a high level of SMT (surface mount technology) components. SMT is the way of the future, very reliable, and precise, but hard to service, by the average ham, with a 40-watt soldering iron. Barring any defective components, or an outside force, SMT should have a service life span of 25-30 years.

Filters slots, lots of slots! The 775 has a nice group of optional slots that are open to a number of filter combinations, in the 455khz & the 9mhz IF sections. You like CW, put in lots of CW filters, the 775DSP comes equipped with a 500hz CW filter. SSB lover, drop in both IF filters, or a happy blend of both. Filters are selected from a combination of 3 buttons on the front panel. Very versatile.

Amp keying relay.

We all have heard of the problems with older (and some newer) ICOM rigs, with very delicate keying relays. The 775 has a much heavier relay, but it is still very quiet, when activated. It is still limited to only 24vdc @ 1amp. Don t try keying your SB-220 directly with it! Use an outboard relay.

The manual does not go into any detail about how to activate the relay, but a single entry on a photo that denotes a S-2 switch for the keying relay. One can only assume that moving the switch turns the relay on and off. The review unit was active, but a person using an ICOM amp, or no amp, and did not want to hear any relay noise, could turn it off. The bottom panel must be removed to do this.

Defects and updates

The review unit had with it a copy of an ICOM service request and work order, from the previous owner. In the request, it stated that the unit would distort on TX after a warm up of 30-40 minutes, but operate normal again after a cool down. The work order stated that the defective IC on the main board was replaced and several factory updates were done, all systems checked for 3 days, and it was done. Factory updates are simple, the replacement of a few diodes and capacitors, this is all for the updates even now. This indicates that the rig was designed very well to start with, and few changes were needed since then.

ICOM service is not cheap, but it is very quick and 99% of the time the problem is fixed, the first trip, unlike some of the "other" guys.

QST review errors!

My 775 predates the unit used in the QST review, but I didn't see many of the problems that QST found in their review unit.

I did find a few errors in QST's article.

Display digit size; QST states that the Main digits are 7/16 inch tall. There are not, they are in fact 9/16 inch tall. QST states that the Sub display digits are 5/8 inch tall. In fact they are 3/8 inch tall.

The QST review griped about the "flickering" display backlighting. I saw none of this in my unit.

Also, QST found extensive audio IMD, but I found little to none of it in my unit.

ON THE AIR

Now for the really important stuff. How this rig performs on the air, in both receive and transmit modes.

First the receiver.

DSP

This feature is very useful. There is a version of the 775 that does not have a DSP unit installed, this would be the same as buying a Ferrari with a small four cylinder engine in it. Without the DSP unit, the rig is a slightly above average HF rig, but with it, the rig becomes a High performance, powerful sports car, of an HF rig. The 775DSP makes good use of the DSP unit inside it.

NR

Noise Reduction, I found to be a highly effective feature. By simply turning a knob the NR function is turned on, and level set, with a marked improvement in noise level, very effective, but I'm not sure if it can do the same with all noise sources. With the combined use of the other interference fighting tools on board the 775, an Op could do serious combat with nearly any noise on the bands.

Several features are tied into the DSP system, and cover a wide area of uses, mostly on receive, but there is a TX DSP function too.

AUTO NOTCH

Like many other rigs on the market today, the Auto Notch feature is becoming a deeply entrenched, and standard feature on almost all rigs coming out from here forward. This feature on the 775 works well, but it's not perfect. I feel my 756 had a slightly better Auto Notch, but both suffer the same AGC loop problem. This is when the offending

heterodyne is nulled, the AGC still generated a voltage, and desenses the receiver, and indicates a signal level on the S meter. The Auto Notch is simply in the wrong spot in the AGC loop, but it's understandable that it had to be done this way to conform to the design goals for the 775. Which were that the rig is fully functional without the DSP unit installed. This restriction "tied the hands", of the engineers. Had the 775 been designed as a DSP rig from the ground up, this AGC loop problem would not be present. All in all, the Auto Notch works well, on weak to moderate strength signals. When a strong heterodyne signal is notched the receiver gets real quiet, but many desired signals can still be heard, it's the weaker ones that will disappear at this point. In addition to the auto notch, the manual notch is available at the same time the auto notch is in use, which makes the notch system on the 775 very useful, and unlike most rigs on the market.

Compared to the newer 756, the 775's DSP is more versatile in its function.

NB

Noise Blanker. Like many rigs out there now, the 775 is equipped with a "wood-pecker" type pulse noise blanker. Since the "wood-pecker" has all but disappeared from the bands, it's questionable why it is still being put in new rigs.

I was hard pressed to find any noise that this blanker could remove, not very effective at all. A more useful NB would be tuned to the much more common 60hz "line noise" frequency. The only problem I could see with that design, is that it would distort incoming audio, since most SSB audio has some 60hz components in it.

The NB on the 775 has many adjustments that can be made, but I could not find any noise that it could do much with.

Rather disappointing, in this area.

APF

Audio Peak Filter, a feature found on many rigs today, is useful on CW and is tied into the CW pitch settings as to track with each other. The APF is also programmable to different widths, unlike older APF systems. This function is a good asset to the CW man.

HPF/LPF

High Pass Filter/ Low Pass Filter system, in the DSP version of the 775, this system allows the user to digitally adjust the high and lower frequency response on the receiver and transmitter, independent of each other. The system augments the other filtering systems on board. A very useful function!

I found the Transmit adjustments to be very effective, "tailoring" the audio with great precision.

This function on transmit, is where the PSN or Phase Shift Networking, is operating. All reports on SSB say that the audio is very, very good, and the effect of adjustments on the HPF/LPF transmit system have a marked effect, and should allow most any mic and voice combo to work well on the rig.

Filter Selection

Selecting IF filters, is done through three front panel buttons. By a combination of different button activation s, the user can configure the IF filters in various bandwidths. This whole thing is a bit confusing at times. A "cheat sheet", might be in order, to keep track of what combination results in which filter width. I found this function to be more geared toward sound, than sight. By pressing filter buttons and listening, I found the right combo filters to use in a given interference situation. I have installed the FL-222 and the FL-223, 1.9khz SSB filters. By switching in and out filters, I can get the best audio with the most interference removal. More interference, more filters in-line, less equals less. Actually the 775 works well in this area.

TX Audio reports

"Well, how does it sound on the air", you may be asking. "Beautiful" is one report. "Broadcast quality", is another. And nearly all reports to date are favorable, from good to excellent. I use an ICOM SM-20 desk mic with it, and have made small adjustments to the transmit audio response, and from what I hear on an outboard receiver, and on the monitor, it sounds just like I do in person. Hams that I have talked to on the air with it, and who know me personally, say it sound just like I do in "real life ".

TX audio on the 775 is clean, clear and "lots of it", as one person put it. A rig that can do that, is a keeper.

A little more on the transmitter section. I was using the unit on 75meters last night and forgot to tune my antenna for the frequency I was using at the time. I chatted for hours at full output; the rig barely got warm, and didn t put up any objections to this situation. I guess my SWR was just under 2:1 at that time. The 775 s auto tuner has an auto-on function wherein the auto tuner will turn itself on, even if it is off at the time, when a high SWR is detected. During the entire evening of operations under these conditions, the tuner never activated. I guess the rig never felt it was needed, even though I do have the set-up parameters set to perform this auto-on function.

The "beefy" PA does not seem to get warm during SSB operations at full 200-watt output. The PA section is the warmest part on the rig, and the rest of the chassis remains relatively cool to the touch. Even so, the PA does not seem to get more than lukewarm; one can very comfortably leave your hand on the rear heat sink, with out fear of blisters. Don t try this in 100% duty cycle modes, like FM, AM, RTTY, etc. It may get to warm for that.

Two words to describe the 775 transmitter: Cool, and quiet.

Twin PBT

Twin Pass Band Tuning. Perhaps the most useful of all the interference fighting tools on late model ICOM HF rigs. Working in the 9mhz & 455khz IF s, this function is a true pleasure to use, and is highly effective. Versatile and efficient. The 781 developed this feature, and now the 775 carries on, and uses it the same way as the newer 756. Aside from the DSP system, if I only had one feature I could have on any HF rig, TPBT would be it.

AGC control

The 775 features a continuously adjustable AGC time constant. I love it! I can dial in just the right amount of AGC action, to suit me. AGC timing, has been a complaint on some rigs that I have had in the past: either too fast or too slow. The 775 has fixed that for me.

Dual Watch

Here again, the 781 developed this feature, and a good idea, keeps going, through the 775 into the 756, and on to the 756PRO.

I use this function to listen to two of my favorite frequencies, on a given band, simultaneously. Neat feature, I like it. The balance control on the rig adjusts the level of audio that the main & sub receiver put out, smooth and seamless operation, to smooth, at times it is hard to tell which frequency the audio is coming from, it could get confusing. The S-meter shows the strongest readings, regardless of which receiver it comes from, while the rig is in Dual Watch mode, but the level is dependent on the balance setting. The main difference on the 775, is that sub receiver can be tuned independent of the main, via the sub VFO.

On the 756, the tuning must be done by switching VFOs, and one can't be tuned, while the other is tuning, so regardless, only one VFO can be tuned at a time, on the 756. A small variation, may not mean much to most, but might be important to others.

Auto Tuner

Typical of ICOM tuners, it's good, real good. Fast, fast, and quite efficient. But, the unit was not designed to tune SWR's higher than 3:1, so don't try to tune your 10:1 ladder-line fed Zepp with it. The tuner is mainly meant to tune an antenna that may be a little narrow banded, giving you more room to run. It should tune into an older HF amp, that has no tuned input, and presents a load other than 50 ohms to the rig. In this case, it is ideally suited to that purpose.

Memories etc.

The 775's memory and scanning system, is very extensive. Band stacking, split operations, memory keyer, quick split, and repeater split, are just a few things this rig can do. The arsenal is well stocked, for most hams, it will be all they need.

The operation manual

What can I say? ICOM manuals are well known for the poor quality of the instruction in them. Vague, limited, barely adequate, are the words that come to mind. ICOM ranks dead last in the quality and usefulness of the manuals they produce, in my opinion. Much of the actual operation, you will have to figure out for yourself, because you won't learn it in the manual.

In ICOM's defense, they do make some of the best "service manuals" in the business, but are rather expensive.

775 vs. 781 vs. 756 vs. 756PRO vs. 765 vs. Etc.

On the used market, you may want to know if the 775 is a good buy. Let me put it this way. If you compare the 775 to a 781, it's no contest, the 775 is a better value, it's DSP, put it way out in front of the "Old rig".

Compare the 775 to an old 765, the gap widens. If you really love your old 765, you'll love the 775 too.

The 775 vs. 756: now it is a little like the old "Apples & Oranges" axiom. These two rigs have different design goals, and it would be hard to fairly compare them.

The 775 vs. the new 756PRO, well, the 756pro is so new, and so different from the 775, that the older 775 is clearly at a disadvantage. But, if you look at it from a money outlook, the 775 on the used market, it currently selling at the same or nearly the same price as the new (projected price) on the 756pro.

This is where I can't vote for the 756pro. As a personal equipment buying policy, I don't buy a rig that has not been on the market less than a year or two. The 775 has been out there, and has proven itself.

What I think would be great, is if ICOM would discontinue the old outdated 781, and update the 775, in the same way they did the 756. Turning the "775PRO", into a total digital IF unit. Cleaning out all the unneeded analog circuitry would lower the cost by a large amount. The performance of the new unit would be greatly enhanced. To keep the new 775 from "cutting into" the 756PRO market, it would be necessary to design it in such a way, that it would be the "bullet-proof", DXer/Contester's rig, and also a unit that appeals to the high-end users. A good feature to add, would be total computer control, (e.g. Kachina or Ten-Tec Pegasus). These are just things I would like to see, my wish list, for what it's worth.

Conclusion

My overall impression of the 775, is good, it works well, and looks great. If I had only two words to describe it, I would say: "Flexible & Versatile." I have owned the FT-1000D, FT-990, IC-765, IC-761, IC-756, TS-940, and TS-930. The 775DSP ranks right up there, as one of the best I have ever used. I look mostly at the receiver performance, and the 775 does that well. I also look at quality transmit, and the 775 does that well too.

I m proud to have it as my main rig. At the used prices these rigs are getting now, it is a lot of rig for the money.

Unfortunately, time has passed by the 775, and now the new 756PRO is perhaps the best rig for the same amount of money.

I hope you have enjoyed reading this article. I have given my opinion & views, on the 775, and now it s up to you to make your own judgement.

Many thanks to my friend, [Adam Farson VA7OJ/AB4OJ](#) for his inserted comments and technical review of this article.

Addendum Sept. 2002

ICOM Japan discontinues production of the IC-775DSP.

See my "[Rumor Mill](#)" page for hints of it's replacement.

Best of 73 de Matt KK5DR

Contact me at: kk5dr@ev1.net

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