From the Help Desk – April 2026

Note – this is part of an ongoing series of related articles that will each take a look at some facet of radio selection, installation, or operation as suggested by actual questions received from Club members or other amateur operators.

Q: I am thinking about buying a used HF plus 50MHz transceiver, but I want to be sure that it operates properly before I complete the deal. I have given the seller a refundable deposit, and he is allowing me to take the radio to a shop for evaluation before I buy it. Is it really necessary to have the radio checked out? I was thinking that if the seller is willing to allow me to take it to be tested, it must be OK. Should the radio be tested anyway, and how is that done?

A: The fact that the seller is willing to allow you to take the radio for testing could be a good sign, indicating that the seller at least believes that the radio is in good condition. However, that belief could just as easily be a false belief based in trust and expectation on the part of the seller. For example, consider the situation where the seller was not the user of the radio and actually knows very little about amateur radio in general nor about that radio in specific. Maybe he is selling items from his father's or grandfather's estate and is hoping to simply get the most that he can for the equipment. A somewhat similar situation came up recently, wherein one of our Club members actually purchased a radio on Facebook Marketplace (FBMP) where the radio had been advertised as a *"police scanner".*

FBMP is one arena where I seldom if ever recommend the purchase of radio equipment, as there are far too many scammers out there selling junk radios on FBMP and leaving the buyer with little or no recourse. I am aware of multiple Club members who have been taken by "good deals" on FBMP and were then out an aggregate of almost $3500 for equipment that would never work again but where the sellers refused to make good on the sales. For that reason, I was skeptical when one radio, a nicely-kept Icom IC-756 PRO III was brought in for testing and evaluation.

Let's talk about how I go about testing one of these radios. With almost any antenna connected to the antenna jack, I listen to the audio output while tuning across the various bands, listening for distortion in the received audio, while simultaneously verifying the operation of the various controls that have direct and indirect impacts on the received signal. If the receiver checks out OK, I move on to the T/R switch and the transmitter. For this testing, I prefer to use my Siglent SVA1015X combination spectrum analyzer and vector network analyzer, in conjunction with one of my Bird 43 directional wattmeters or maybe my Telepost LP-500 Digital Station Monitor. Also necessary are some cables and adapters, and an appropriate attenuator used to protect the SA from high-level RF signals entering the analyzer front end. Finally, the last required item is a suitable dummy load, but more about that later.

The radio is configured with both a mic and a Morse key. RF output from the radio is routed to the Bird meter inlet or to the LP-500 adapter inlet. The Bird meter or adapter output is passed directly to a 100W dummy load for some basic power testing. The Bird meter should be equipped with an appropriate element for measuring the entire HF band as well as its upper-end and lower-end neighboring bands, meaning that I can test from 1MHz through to 60MHz.

In this case, basic power output testing in CW mode, AM mode, and FM mode showed that the full advertised power for the IC-756 PRO III was being developed and sent to the antenna. We saw 40 watts in the AM mode, and 100 watts in both CW and FM modes. With the assurance that when set to maximum RF power, the full advertised power would be developed, we moved on to frequency testing.

To accomplish the frequency testing, I modified the output cabling scheme slightly. The Bird meter outlet was now provided with a “TEE” fitting that allows the signal to travel two ways. One signal path from the tee is directly to and into the dummy load. The second output signal path is to the SA, where it is passed into the *RF IN* port via an inline attenuator. In this situation, I used my 10W 40dB inline attenuator, installed directly at the *RF IN* port of the SA. The SVA1015X was set to SA mode, with a stimulus range of between 500kHz and 60MHz, theoretically allowing us to see the entire HF band. I was now ready for frequency testing.

I began by setting the radio up for CW mode, at minimum output power of five watts, and with the VFO set for 1.8MHz. The result was a single peak on the SA screen, but offset slightly high from the VFO value. I moved to 3.6MHz and repeated the test, obtaining similar results. This was the case all the way up the band list to 10-meters, where I decided to stop and make some changes. The one thing that we never saw at all were any peaks at locations that would represent harmonics of the fundamental frequencies at play here. From that, it was safe to draw the conclusion that the harmonics were properly attenuated and should therefore cause no problems nor any reason to reject the radio.

Because of certain patterns that became evident as the testing progressed, I became convinced that the difference between the frequency set in the IC-756 VFO and that reported by the SA was a function of the granularity of the SA, based upon its sampling rate and the width of the frequency span that we were using as a test basis. I decided to focus directly on each transmit frequency, band-by-band, looking for the highest level of accuracy that I could attain for each chosen frequency.

This time, when I set the VFO to 1.8MHz, I also set the SA stimulus to a frequency range of 1MHz (START) and 2MHZ (STOP). This time, when making the transmit test, the SA reported the output peak to be exactly at the frequency set in the radio VFO window. Using this process, I tested a couple of frequencies in each of the bands supported by the IC-756 PRO III, with the same excellent results. This radio was as closely aligned as any radio ever could be. Now it was time to go back to some more detailed power output testing.

I removed the tee fitting and the cable connection to the SA, leaving just the Bird meter and the dummy load in circuit. However, when I began the power output test, I discovered that there was only a very minimal power output from the radio in any mode, on any frequency, and at any power setting. A quick check of the feedline circuit cables and connectors showed everything to be correctly installed and connected. Setting the front panel "S" meter to its SWR mode, a quick keying of the mike showed that the SWR would fully deflect the needle to the right – indicating *infinite SWR*.

Stripping down the test circuit to just a dummy load and a single length of coaxial cable made no difference. By this time, some of the other Club members who were at the Clubhouse got involved, and we quickly tested both lengths of coaxial cable that had been used, checking them for shorts as well as for opens. The cables tested out OK. We then measured the resistance through the dummy load, and found it to be as close to fifty ohms as was possible. The only test left to make was an SWR test of the dummy load.

I switched the SA1015X to its VNA mode and connected the dummy load up to the S11 port, after configuring the VNA for SWR measurement with a stimulus range of 1MHz to 60MHz. A *very* surprising result was obtained. The SWR of this dummy load had suddenly and without any warning changed from a 1:1 ratio up to a high of 33:1 at the 1MHz end of the sweep, a low of 9:1 at about 14MHz, and then back up to about 17:1 at the 60MHz end of the sweep.

I swapped out that dummy load for another one from the test bench and resumed the testing of the radio. The output power testing showed that the power level tracked the power level control setting quite accurately on all bands and in all modes. In CW and RTTY as well as in FM mode, the maximum measured output power was right at about one hundred watts, as advertised. Furthermore, the maximum output power in the AM mode was right at forty watts, also as advertised.

The end results were quite interesting. First was the fact that all frequencies generated by this radio are right exactly where they are supposed to be, which is a great thing. Next is the fact that the output powers are all up to snuff and are right where the specifications sheet says that they should be. No scientific testing was done either as to the modulation levels on transmit nor as regards any of the receive functions. However, the very non-scientific but more real-world method of human-ear testing showed this radio to be in good shape in those areas as well. Lastly, we got to see first-hand that the protective power-roll-back system does in fact work and it works quite well. When the SWR went off the chart, the radio did its job and cut back on the output power so as not to damage the output transistors in the radio.

Iin all ways that matter, this radio seemed to test out in great shape, and I would have no hesitation about buying it, which just goes to show that there's an exception to every rule. My *"don't buy radio equipment from a FBMP seller"* policy was shown to be invalid in this case. I am very happy that **Josh Boylan KE2FSC**, the new owner of this great radio, got such a tremendous deal on a really nice radio.

This is a good illustration of the type of testing that can and most likely should be made to any used radio that a ham may tentatively decide to purchase. If the radio checks out OK, then by all means, go ahead and buy it. But… if it falls short, either re-negotiate the purchase price based on those findings, or just walk away from the deal completely. I hope that this illustrative case history explains the type of testing that can and probably should be done when time and conditions permit, before a radio is purchased.

See you next month!