The following is a supplement to CQ's review of the West Mountain Radio RIGblaster Advantage computer-radio interface, by David T. Witkowski, W6DTW, which appears in the February, 2012 issue of CQ.

Digging Deeper:

Benefits of a Separate Sound Card for Digital Modes

One of the features of the RIGblaster Advantage by West Mountain Radio is that it connects to your computer with a single USB cable and provides both a separate USB audio device (soundcard) and serial port (com port) for your system. Some advantages of this arrangement are described in the main review. Others are presented here, in more detail, specifically the separation of digital-mode audio from computer audio and improved *rate accuracy* for your digital audio.

Most modern PCs offer built-in audio devices, and some rig interfaces simply cable into that device. This presents a problem, though, because you will have to take steps to ensure that you modify (or most likely disable) your operating system's sound scheme so that you don't end up transmitting "You've Got Mail" or other audio alerts into the CW/data portions of the amateur bands. Doing so would likely make you unpopular with other operators, and might result in a call or email from your friendly ARRL OO or even the FCC. With a dedicated audio device, you can assign the PC's audio in/out scheme in such a way that PC audio and digital mode audio are kept completely separate.

Another reason to want a dedicated audio device is to address the issue of *rate accuracy*. Most modern audio devices convert incoming analog audio to/from digital data at a rate of about 44,100 samples/second. However, there is always error in this sampling rate which depends on the type of ICs used, whether the audio device is built into a larger multi-function IC, etc. Even on higher-end laptops, the sample rate error can be on the order of 2% - 3%. While this wouldn't have an effect on your ability to listen to music on your laptop or make VOIP calls on Skype, it can have an effect on your weak-signal decode sensitivity for modes like Olivia or JT65. Weak-signal mode applications typically have a way to either manually or automatically compensate for the sample rate error, but not all digital mode applications offer rate error compensation and so this sample rate error can have an effect on your ability to successfully decode that rare DX station; especially if both stations are running audio devices with high error rates.

I've found that, in general, integrated soundcards in laptops and low-end PC motherboards tend to have higher sample error rates than dedicated soundcards in either desktop expansion slots (true "sound cards") or USB "audio dongles." This is likely because in lower-end or highly compact systems, the audio circuitry is part of what's called a "platform chipset" that interfaces the CPU to the PC's memory and "human interface" circuitry for functions such as USB, video, storage, audio, etc. On a platform chipset, the audio circuitry shares the same semiconductor substrate as high-speed digital circuits, so the audio interface's DAC (digital-to-analog converter) and ADC (analog-to-digital converter) are affected by the digital noise from nearby circuit sections, resulting in increased sample rate errors.

I did some testing on three different laptop PCs, and compared their sample error rates to two aftermarket USB audio dongles; one of which I obtained from a local surplus electronics warehouse for about $10. To my surprise, the age of the PC didn't matter much. My worst audio device was in a higher-end laptop (unfortunately, as it turns out, the rig I usually use during Field Day), which boasts a high-speed multi-core CPU but has a dismal average sample error rate (computed by) of 1.36%. My best audio device is (wait for it...) the $10 USB dongle from the surplus shop, which has a worst-case average sample error rate of only 0.07%! My results are in the table below.

As you can see, the sound card in the RIGblaster Advantage performed in the middle of the range, much better than two of the three computer soundcards but generally not as well as the dedicated external audio devices. It was, however, quite consistent over both transmit and receive. -- *David T. Witkowski, W6DTW*

To read the full review, see the **February, 2012** *issue of CQ, available on newsstands or from our office, or in digital form. To order, call 800-953-9797 during east coast business hours or visit <http://store.cq-amateur-radio.com/StoreFront.bok> anytime.*

Soundard Rate Error %			
Machine	**Receive (Mic)**	**TX (Headphone)**	**Average**
Compaq Presario V6000	2.02%	0.00%	1.01%
Dell Latitude D410	0.67%	0.67%	0.67%
Dell Latitude D420	2.03%	0.68%	1.36%
External USB Audio Device #1	0.00%	0.68%	0.34%
External USB Audio Device #2	0.02%	0.12%	0.07%
Rigblaster Advantage	0.62%	0.65%	0.63%