

Setting Up Audio Devices to Play Nice With VoxPro

By Doctor Vox

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Introduction for Rank Beginners

We begin this discussion with a few definitions. The audio interface is the device in the computer or connected to the computer which allows audio signals to stream into and out of the computer. The term is used synonymously with audio device. Audio interfaces come in many varieties, including:

Onboard:

Most computers have an audio chipset which is built onto the motherboard. The computer's mic, line, headphone, and speaker jacks (if present) all talk to this chipset. This is the Default Windows Audio Device unless you tell Windows otherwise (we'll get to that later). What that means is that any time the operating systems wants to bleep at you, or you watch a video on YouTube, or you play an MP3 file on a thumb drive – this is the audio device used for playback. Realtek and SoundMax are two widely used onboard chipsets.

Soundcard:

There are many vendors who manufacture PCI or PCIe cards that are inserted into expansion slots on the computer's motherboard. These cards offer greater performance – higher audio quality, more channels, digital I/O – than is available through the onboard device. Soundcards which are widely used in radio applications include those by AudioScience, Digigram, M-Audio, Lynx, and Echo.

USB:

These are essentially outboard sound cards. They provide the same audio functions as an internal soundcard, but talk to the host computer through a USB port. There are probably more vendors of USB audio interfaces than any other type of interface. Popular in radio applications are those made by Henry Engineering, Lexicon, Yellowtec, Focusrite and PreSonus. A special category of USB interfaces which are becoming popular in small studios are USB mixers, such as those made by AudioArts, Behringer, Allen and Heath, Mackie and Arrakis.

AoIP:

These are virtual audio interfaces that use the computer's own CPU and NIC to stream digital audio in and out, without ever entering the analog realm. These digital audio streams are carried on Ethernet cables and employ IP technology for transport and switching. Wheatstone's WheatNet and Axia's Livewire are widespread examples of AoIP interfaces used in radio stations.

The Crux of the Issue: Audio Format

There are three numbers that determine the format of what we call PCM audio, which is uncompressed, full bandwidth, digital audio. These are the number of channels (typically one or two), the sample rate (typically 44100 or 48000 samples per second), and the sample width (typically 16 or 24 bits). Use of one-channel formats in radio is rare, so we will not consider them further. Sample width determines dynamic range; but for our purposes 16-bit and 24-bit are essentially equivalent because VoxPro uses the 16-bit format even if the audio interface is configured for 24. For us, the most important variable in the format is the sample rate. The 44.1KHz rate is still with us because of the early prevalence of compact discs: the format of CDs is 2-channel/16-bit/44100Hz (which translates into $2 \times 16 \times 44100 = 1,411,200$ bits per second, or 176,400 bytes per second). The 48KHz rate is the default sample rate of the internet age – it is the rate most often used in online venues like SoundCloud, YouTube and iTunes, and it provides a slightly higher frequency range than the CD rate (2-channel/16-bit/ 48000Hz sound translates into 1,536,000 bits, or 192,000 bytes, per second).

Setting Audio Formats to Work For You, in Three Easy Steps

Here is the nugget of what you need to know in order for VoxPro and your audio interface to work well together: they need to be set to the same format – especially the same sample rate. Mismatched sample rates are the most common audio issue we hear about, and the simplest to fix. The symptom of mismatched sample rates is playback which is either too low (slow) or too high (fast), by roughly 9% in either case, the error attributable to the ratio between 44100 and 48000. Mismatched formats can also be responsible for skipping and dropouts while recording and playing.

Step 1 – The Audio Interface

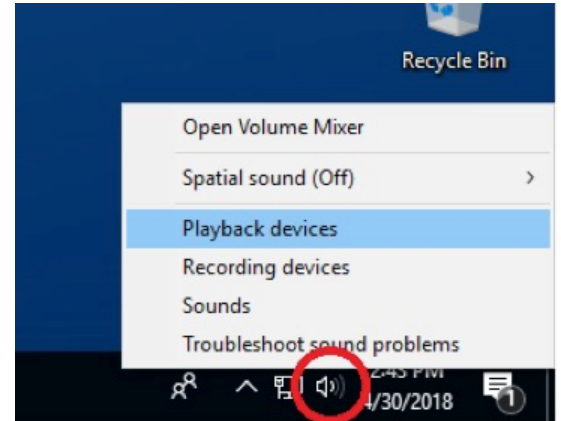
Start by deciding which sample rate you are going to use. In some cases, this decision has already been made for you: for example, if you are working in an all-digital studio running WheatNet IP, then the format has been set by the blades and consoles in the network, and they are all synchronized to a master clock running at this sample rate.

Some soundcards and USB interfaces come with a vendor-supplied software configuration utility that can be used to set the preferred sample rate of the device. Soundcards which support digital I/O by means of an AES-EBU connection usually have the option to operate either as the master clock, or as a slave to an external clock. Both options require a sample rate to be chosen.

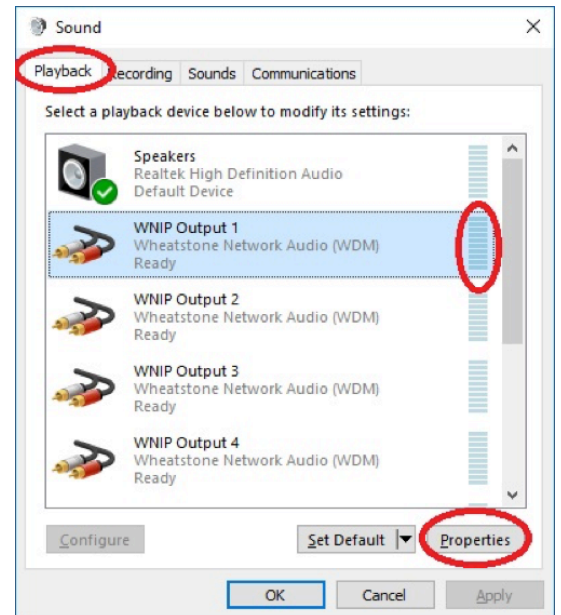
Not all audio devices have a setup utility, but if your does, check it to ensure that the device is configured to run at your preferred sample rate.

Step 2 – Windows Sound Manager

The quickest way to open Sound Manager is to right-click the little speaker icon in the Windows task bar, then select Playback Devices or Recording Devices in the pop-up menu:



In our example, we've opened Sound Manager to the Playback tab, which displays a list of available playback devices on the computer. Note that the onboard Realtek device is the default Windows audio device, as indicated by the green check mark next to its icon. Each device in the list has a small signal peak meter on the right, which can be used as a visual confirmation that playback to the device is actually working. The Properties button is enabled when a device in the list is selected:



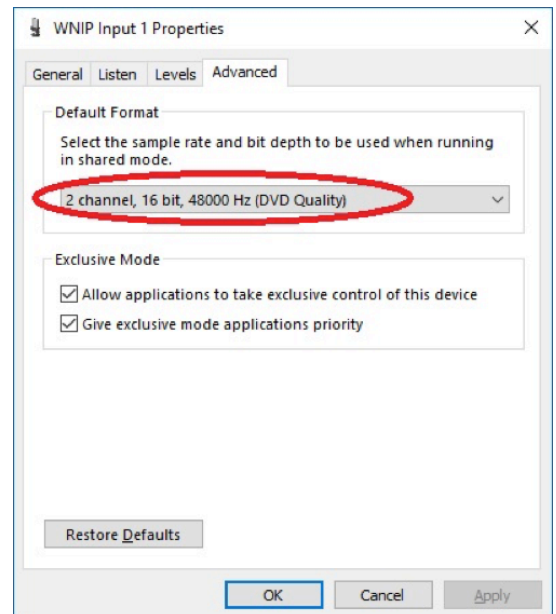
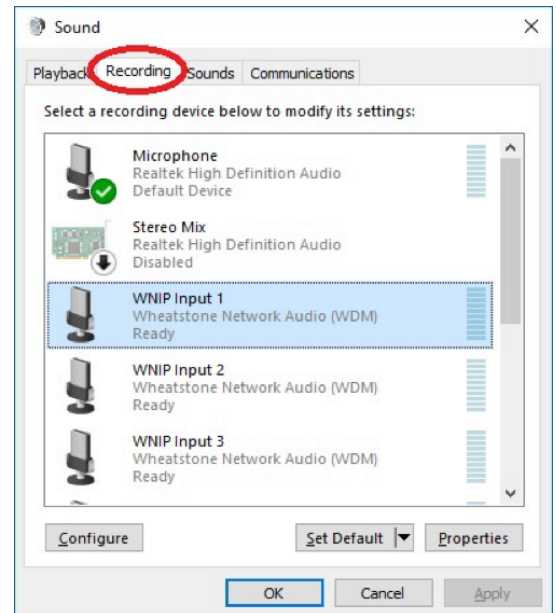
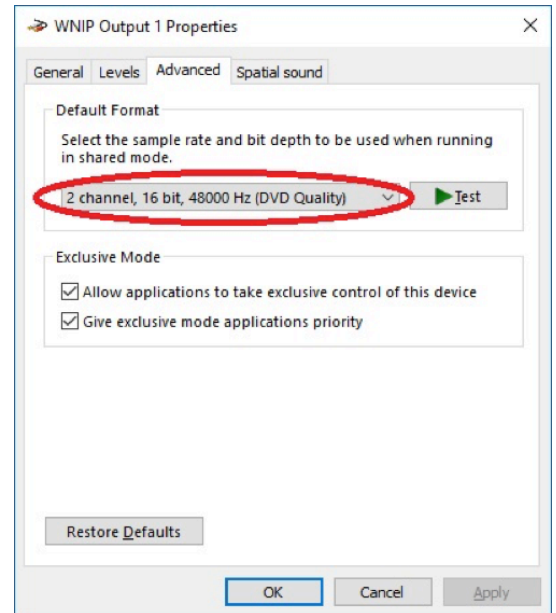
Clicking the Properties button opens the property page for the selected device...

The Levels tab provides an output volume control, and the Advanced tab is where we set the format for the device:

It is a good idea to set all devices in the list to the same format. Note also the Test button to the right of the format selector. Click it and you'll hear a sequence of pleasant chimes if your device is working and you have a signal path all the way from the computer to the studio monitors.

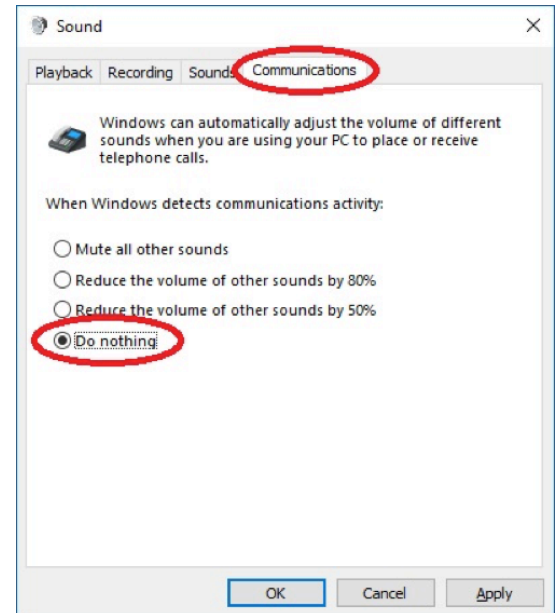
Once your playback devices are configured, select the Recording tab to display a similar list of all available recording devices. In the example below, the computer's built-in microphone is the default recording device. The recording tab also provides a signal level meter for each input device, useful for confirming the presence of a live signal. If you see no activity in this meter, it is a sure sign that you have no audio input to the computer, and therefore will have no input into VoxPro.

As with the playback devices, you may view and change the Properties of the selected Recording device. Input volume level is set in the Levels tab, and the format of the device is set in the Advanced tab. The recording format should exactly match the playback format, and all recording devices should be set to the same format.



There is one more adjustment we can make in Windows Sound Manager, since we have it open. Go to the Communications tab and select the “Do nothing” option. This prevents certain system-controlled audio processes unrelated to VoxPro from interfering with your playback volume:

One final word about the Default Windows Device before we leave Windows Sound Manager: We feel that in most cases it makes sense for the default device to be set to a device that VoxPro is not using. This keeps VoxPro’s audio devices completely separate from whatever other extraneous audio activity may or may not be happening on the computer, and thus reduces the chance that watching an online video, for example, will inadvertently change the sample rate of the audio device that VoxPro is using.



Step 3 – VoxPro

The final step in configuring your audio devices takes place in VoxPro itself. You will need to log into VoxPro’s Administrator account, open the Settings menu, then select Audio Devices and Formats. This opens the Audio Devices dialog, in which you select the playback and capture (record) devices which VoxPro will use, as well as the audio format. Note that the format must match that which was set in Windows Sound Manager.

When initially configuring your audio devices in VoxPro, you will see that the playback and record devices set to the Default Windows Device. This means that VoxPro is using, or attempting to use, whichever audio devices you have selected in Windows Sound Manager to provide playback and capture services. We recommend explicitly selecting the devices you wish to use, rather than accepting the default (which could change without you knowing it).

That completes audio device configuration. Please contact Wheatstone technical support at techsupport@wheatstone.com if you continue to have problems with audio devices and VoxPro.

