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How to Get a Record Deal – Guaranteed!

by Alec Watson

Having just been informed, by phone, that I am "*off the hook*" for writing a techie article in this issue, as I am writing the "Home Recording" feature, I thought I would take the chance to write about one of the questions I get asked the most at clinics and workshops: "How Do I Get A Record Deal?"

Let's start with the story of a Canadian musician, a *close* friend of mine that used to live in Nashville. Every once in a while he would get a really good payday for playing or engineering, and sometimes producing. Most of the time, however, he just crept by, completely living beyond his means so that all his friends thought he was doing much better than they were; which is of course the next best thing to *actually* doing better than your friends. The really good paydays kept him in Nashville; he knew that a big hit production was just around the corner. Unfortunately, at the time, he really didn't understand how the music business worked; even though he could, of course, explain it all. He knew all about publishing, writing, mechanicals, endorsements, touring, points, management … but strangely, he never really *understood* how it *really* worked. Having gone to school, worked as house producer at a very successful publishing company, and engineered for the 'A' list producers, it seems hard to believe (but true), this friend of mine just didn't get it.

The true understanding of the music business started to come clear to ~~me,~~ I mean him (let's give him a name – Plod), while Plod was working with an act that you have probably never heard of: Ronna Reeves. Ronna had some pretty good achievements as a blossoming country star: a strong first record, good management and a good record company. She had decided, after a few years in the country genre, that country wasn't really her thing and she wanted to make a pop record. When Plod began playing keyboards for her band, she had just finished her pop project with Peter Cetera, and her management had her placed at the pop label as a priority act. Ronna was good looking, a fantastic vocalist, had some pretty good songs (which in hindsight really needed to be awesome, not just pretty good) and a music video for MTV. All the ducks were in a row, what could go wrong? Well, like I said – you've probably never heard of Ronna Reeves.

At the same time as Plod was touring with Ronna, he learned from his buddy, Nashville Predators' Defenseman Joel Bouchard, that Joel and his hockey player's band had been offered a record deal (several in fact). From his years as a publishing company producer, Plod knew lots of people that had been "offered" record deals – you probably know a bunch yourself. To Plod's amazement, however, Joel had letters from nearly every label in Nashville expressing an interest in putting together a recording

project with Joel, Sebastian Bordeleau, Denis Lambert and Darren Turcotte of the Predators. To help whip the band of NHLers into musical shape, Plod was assigned keyboard duties; this was truly the worst band Plod had ever played with. I should add that this includes the accordion band that Plod played in when he was eight; poor Plod, what chance did he ever have in the music industry when his parents put him in an accordion band? That's a whole different story though.

Signed to Warner Music Nashville, the NHL band "The Offside" was a local hit. Now you could point out that you have never heard of this record either (which of course would ruin this whole story), but without going into detail, it turns out that the NHL owns the rights to anything to do with the Predators – including records … the en-*suing* legal battle squashed the record. We will never know if it could have been a hit. But I will add that nearly everyone from The Guess Who to Ted Nugent wanted, or had some involvement with this record.

Here is the lesson, and it's one you probably know … but do you get it? Do you *really* get it? Record deals have something to do with musical talent, a lot to do with entertainment, and *everything* to do with: (cue fanfare) – *selling records*. Of all the projects Plod ever worked on, no band had less musical talent than "The Offside." Of all the incredibly talented people Plod ever worked with, some of them stars, tabloid favourites and household names, others unknown outside of their hometown, no act, other than "The Offside" had ever received contract offers from every label in town.

There it is, that's the skinny: you can get a record deal – *guaranteed*, if you can sell records! So while you're worrying about song hooks (extremely important), what you want to say as an artist, and your act's image, consider this: what is your selling hook? Why will people buy your records? When competing for a share of the local consumer's expendable income, why are they going to buy your record rather than someone else's? *Buy* Jove, if you can answer *that* simple question, you have yourself a record deal! Sure, there is that *other* route where you count on talent, perfection of craft and hard work; but if you choose that route you are going to have to count on a bunch of luck. If you're after guarantees and don't necessarily care about saying something, go the *simple* route: create something that sells records – you will be guaranteed a deal.

… Of course, if you can actually create something that sells records, do you even need a record deal? Why share your fortune?

Producer/Engineer Alec Watson, never has figured out the answer to the question – why should people buy his records. In fact, he thinks the question sucks! Instead he is happy to Plod along making music for fun and still has all his friends thinking he is far more successful than he really is.

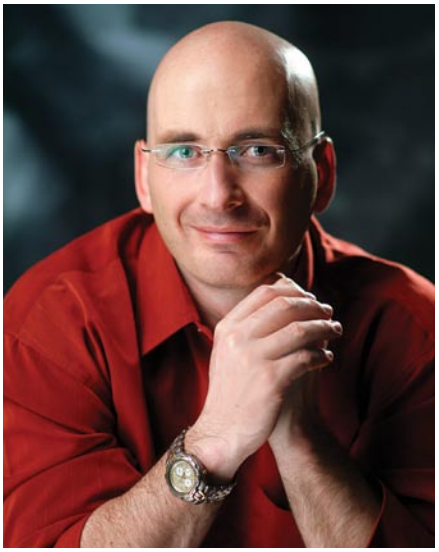
Mac vs. PC

By Alec Watson

It seemed like the PC vs. Mac war was finally starting to cool down, especially as the hardware platforms became more similar, but then along came these "Mac" commercials ... and it all starts again. Normally, I try to write about some kind of little digital gem in this column, so why talk about the Mac vs. PC thing? Well, it turns out that the addition of a little joke like: "Garage Band ... the only reason to buy a Mac. Lol!" garnered me all sorts of e-mail about how I am missing the boat on how great a system Macintosh is ... and why would I even joke and potentially pass along misinformation in an article about software? Apparently, I had no idea how sensitive some Mac people are. According to the commercials they probably shouldn't be so uptight 'cause they are so busy being hip and cool. Which reminds me, isn't the hip, cool Mac guy actually the high-school super nerd from "Dodge Ball." Yep, he really is the "... if you can dodge a wrench ..." (which he fails to do) guy. Incidentally, this is my Dad's all-time favourite movie scene – my guess is that as a British machinist he has thought about throwing a wrench at someone on several occasions, but alas I digress.

Anyway, as an owner of both systems, a dig audio guy, a beta tester for several software companies, a reviewer for *Canadian Musician* and *Professional Sound*, and a generally argumentative pain in the ass, I thought I would take this opportunity to share my thoughts on PC vs. Mac – hopefully dispelling some misinformation in the process.

First off, I have little time for anyone that is a "PC guy" or a "Mac guy." My interests lie in: are you a good musician? Do you have something to say? Does the machine and software you use help your creativity or does it hinder it? The "Mac guys" say: "Perfect, you get it! People with PCs spend too much time maintaining and setting up their machines while mine just works!" You know what? To this they have a point ... kind of. Let's define the big difference between PC and Mac. As little as five years ago, they were completely different beasts. Mac has always arrived in stylish packages – nice! It was also the platform first



embraced by Digidesign – probably the single biggest reason that Mac is generally considered the musician's platform. Five years ago, the techs would have told you that if you want to record digital audio you are going to need a 10,000 RPM (really expensive) scsi drive. As PCs natively run with IDE drives they are not as good. This argument apparently lost a lot of its charm when Mac adopted IDE drives. In fact, Macs and PCs, when it comes to hardware, are very similar these days. So what's the Mac/PC war about? Is it just Coke vs. Pepsi 2006? Well, yes and no.

A Mac is made by a company that has strict controls over its hardware, its software, and its operating system. If Mac were the biggest seller of computers they would be a LOT scarier company than Microsoft. A PC is a system with all sorts of hardware manufacturers, many more software writers, and mainly one operating system – Microsoft. The strength of PC lies in competition, with many manufacturers competing for market share creating a great value for money proposition. The weakness of PC is the fact that there are so many pieces of hardware that the operating system has to be compatible with. The strength of the Mac comes from good software written for a comparatively very limited number of hardware choices – this helps with system stability.

So what to buy? Well, when I joked about Garage Band being the only reason to buy a Mac, what I was really saying was that I thought that this little program, one that comes with a Mac, was excellent for creating music simply. Honestly, there is nothing that compares to Garage Band available for PC. It is an elegantly simple interface and it allows the user to be very creative without having to "think" or engineer too much. The weakness? It's not very efficient. For the amount of processing power that the average Mac has, you get very few effects and tracks when you compare to ... a PC running Sonar. A decent PC running the latest version of Sonar can run WAY more effects and tracks than any Mac of the same price.

One of Macs good arguments is that PCs tend to come with "Crap" ware (freebie programs that are a pain in the ass). You want to fix this? Reformat your PC when you get it and give it a clean install of Windows. Clean Windows is a thing of beauty – is this a pain in the butt? Well, yes, but considering that you are getting your computer for around $500-$800 cheaper than a comparative Mac, a quick, automated re-install is a great fix.

Bottom line: I mention something like this in EVERY software article I have ever written. The computer you use is a tool; you are the musician. If you want your tool to be very simple and you have a good budget – go with the Mac. If on the other hand you want MAXIMUM bang for your buck go PC. The digital 1's and 0's sound identical from each machine. A great song is going to sound great on either machine ... and a crappy one...

Spend your time writing and producing great music. A clean operating system on a PC makes my PC purr like the Mac. Forget wasting your time on debating about operating systems and find something to say with the tools at your disposal. We live in an amazing time and have amazing tools – enjoy!

Alec Watson is a Producer/Engineer and argumentative tech geek that lives and works from his destination studio on Vancouver Island.

Vocoder 101

by Paul Lau

Last year, my friend Larry Gowan invited me (with backstage passes in hand) to see him perform live with Styx and the anticipation was quite overwhelming. The late '70s and early '80s briefly returned the moment they broke into "Mr. Roboto"; this was the era of the Vocoder in its early musical prime. Actually, when you look at the history of the Vocoder or just the development concept of the technology by Bell Labs, it's been around for almost 80 years. I recall that the name Vocoder actually came from "voice encoder" and/or "voder." The Vocoder is also synonymous with Wendy Carlos and Robert Moog during the '70s as they were the forerunners in the development and use of the Vocoder in musical applications.

The Vocoder is sort of a speech analyzer combined with a synthesizer and was originally developed as a speech coder for telecommunications applications around the 1930s, the idea being to code speech for transmission for secure radio communications. Most likely, this had a military application at the time. This is how it actually works in lay terms: by using several band pass filters, the vocal coming in from the microphone is divided into a series of frequency specific bands of sound. Then the volume envelope from each frequency band is transmitted onto a series of voltage controlled amplifiers which are modulating a corresponding set of frequencies which are filtered out from the pitches produced when you hit the keys. The timbral selection is controlled by an onboard oscillator which is usually rich in harmonic content and a noise source to provide sibilants, like an added synthesizer patch sound. So, if you have a Vocoder try this combination creation: add a vocal patch and a synth string patch, assigning them to different upper or lower octave ranges, adjust the variable attack and decay while modifying the variable portamento and then detune up or down two full tones. Presto! One funky Vocoder combo sound!

The TalkBox is commonly mistaken for the Vocoder. The TalkBox is different in that it is a musical sound effects device that allows a musician to modify the sound of a musical instrument by changing the shape of one's mouth, and with the Vocoder you just speak or sing into the microphone that is connected into the keyboard, adjusting parameters and playing the keyboard to change the sound. The TalkBox effect can be used to shape the frequency content of the sound and to apply speech sounds like singing, onto a musical instrument, usually a guitar or keyboard and hence this is where the confusion lies,

because they both require you to use your mouth. The TalkBox is an effects pedal and has a speaker connected with an airtight plastic tube that is taped to the side of a microphone, in or near the mouth. You've probably seen Kid Rock use this on some performance on MTV or MuchMusic, also Peter Frampton was quite famous for his use of the TalkBox on *Frampton Comes Alive!* Visually, the hardware Vocoder is either a keyboard or rackmount/desktop module connected to a keyboard controller and microphone through MIDI.

In the world of hardware Vocoders, you may think of the original Sennheiser Vocoder (used by Kraftwerk) and the many different incarnations of Roland Vocoders through the years ie: VP-330, SVC-350, and VP-70, but a few years ago Korg came out with a three-octave analog modelled microKORG Synth/Vocoder in the $500 range and it gave Vocoders a new breath of life (no pun intended), renewing interest for a whole new generation of musicians. With so many hovering around a microKORG at music stores and being fascinated by re-creating the Cylons from *Battlestar Galactica*, I have been told that this little keyboard has out-sold the record breaking Korg M1. You may remember the M1, which revolutionized the entire keyboard industry with affordable sample technology during the '80s. Check out the latest hardware releases like Korg's Radius and Roland's VP-550.

But for all you non-hardware enthusiasts, there have always been numerous Vocoder software programs and plug-ins through the years – remember the Cylonix 18 Channel Vocoder for Windows95? How about the more recent Zerius, SonicismVintage, Fruity, Reason Vocoder, and Prosoniq Orange Vocoder to name a few?

That leads us to a second case of mistaken audio identity with songs like "Believe" by Cher, "Blue" by Effiel65, "One More Time" by Daft Punk, and "Days Go By" by Dirty Vegas – these effects were not created with the Vocoder, but with Auto-Tune software … and that's a whole different article in itself. But do not despair, the Vocoder is up front and centre with the latest hit album from Prince, *3121* (his house address?) which uses the Vocoder on "Incense and Candles." The Vocoder has also made a few movie debuts as in *Donnie Darko*, *A Clockwork Orange*, and *Sgt. Pepper's Lonely Hearts Club Band*. Whether you have access to or own a Vocoder, or have tried a Vocoder plug-in, this is one powerful, memorable effect and is great fun to experiment with, just remember … too much of a great thing can be noticeably annoying!

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Modelling 101

by Paul Lau

For the last decade, modelling technology has garnered well-deserved respect among musicians who tried to capture and record the elusive analog sound via digital.

As a primary tool and technology, digital modelling has been used on countless recordings and hit albums. It has always been taken for granted that achieving a particular sound musicians required an arsenal of guitars, amps, and vintage mics. There was also a time among the purists when digital modelling was taboo. Oh, how the world has changed! But still, to convert the unbeliever, one just has to follow the pioneering work of a few progressive companies such as Line 6, Roland, Behringer, and Antares. So how does this all work?

Let's start with guitar amp sounds. Modelling was developed by measuring and analyzing every tonal aspect of tubes and their associated circuitry to determine how they interacted with an electrical signal passing through them. Plucking the string on an electric guitar produces a particular electrical signal and each element of the circuitry that alters the tone of the guitar is in fact processing that signal. By creating software models in DSP (Digital Signal Processing) of how the circuits process the guitar, one has the ability to link and control these virtual circuits in many creative ways to reproduce a certain desired tone or sound.

The technology that simulates and emulates the complex interaction of microphones, speaker cabinets, and room acoustics has finally become accessible and affordable to the average musician. This allows the musician to create either very simple sounds or an array of sought after replications of tones and sounds from years gone by. With so many benefits, adding hardware interface modelling to time-tested editor/librarian software was an easy choice. This allows users the ability to back-up and store favourite custom patches and creative combinations.

There are also two important additions that have progressed within the world of modelling: the ability to morph guitar and synth sounds and the polyphonic effects employed by modelling. Creating familiar-sounding amps and tones of guitars and basses can be extremely fun but perhaps a bit boring or redundant; I tend to explore what can be created from scratch, utilizing combinations of modelling and sound shaping.

On another developing level of modelling, Roland has developed their proprietary PBM (Physical Behavior Modelling) sound engine and sound modelling technologies. PBM uses complex algorithms to accurately model an acoustic instrument, such as the converter on a free-bass accordion. In turn, one has a true sounding instrument with a multitude of options that list like a digital buffet menu without the heavy price tag.

This article is not complete without mention from the leaders in mic modelling. Since the technology debuted, mic modelling has been synonymous with Antares. With their mic modelling software, one can afford to record every track through a different model of a specific mic to produce the ideal sound you want reproduced. Imagine if you could turn the wind screen on or off? Try close or far placement or adjust tube saturation, you decide! What's also amazing are the limitless applications, especially in live stage applications and performances. Just imagine using a $3,000 mic on stage, without having to fork out the bucks to have the same effect (but remember the laptop and interface – hidden costs). And in the studio, an art form in itself, imagine during mixdown being able to effectively change the mic on an already recorded track and listening to options of what the quality and tonal changes would be using an array of multiple mics. For example: if you recorded a vocal track with a Shure SM58 (which everyone has or should have in a closet somewhere) and you want it to sound like one of the following: AKG C414B/ULS Limited Edition Gold, Manley Labs Reference Gold, Neumann U 87 70th Anniversary Gold Edition, Telefunken U-47 (Original Tube), with mic modelling, you can!

I find that the most powerful use for modelling is combining the modelling technologies whether producing either recorded or live music. Whether you're a purist or a total tech musician/producer, the acid test is when you close your eyes and have a good listen, can you tell the difference? Try a blind test! The truth of the matter, no, the truth of technology comes down to what you hear and I can say I'm a believer!

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Audio Interfaces 101

by Paul Lau

There have been two milestones in the music industry since computer audio interfaces appeared more than 20 years ago. First, MIDI (Musical Instrument Digital Interface) allowed one to harness and control multiple keyboards and sound modules from different manufacturers at once in software. Shortly thereafter, dedicated professional quality audio interfaces appeared as the second milestone, launching an exciting new era of digital recording with cost effective compatibility across the board.

Audio interfaces translate and convert sound waves (analog) into the digital language of ones and zeroes. Generally speaking, musicians find that the quality of home computers that include sound capabilities tend to be consumer-grade and have noticeably less fidelity in reproducing sound, or are lacking in overall sound quality. Therefore, dedicated interfaces are a must when working seriously with sound.

There are three main types of audio interfaces. One of the earliest was the PCI audio card connected directly to the computer's motherboard. It may or may not have a breakout box with multiple audio inputs and outputs and MIDI connections. PCI cards usually offer the best integration with the computer and the most accurate MIDI timing. But if you've never opened up a computer, installation could be quite daunting. And even after getting the card settled into the motherboard, you still could have resource conflicts with other cards. With that said, when your only choice was a PCI card interface that didn't have a break-out box, there was the added cost of integrating a mixer, which was also somewhat cumbersome. Many of you will remember purchasing at least a four-bus board as the required first step in the crazy world of wiring and connecting all the extra cables so you could monitor what you were recording in real time. Initially, USB 1.1 seemed to be a quick fix with a separate external box that plugged into a computer's USB port. But practically USB 1.1 was relatively a slow protocol, so there's a bandwidth limit and you could not get many channels of great fidelity. You'll probably get, at the most, four simultaneous channels, or only use one to two channels at a time in a small home studio setup. If you are demoing and just having fun this is quite sufficient.

When FireWire interfaces arrived with considerably faster communication, most pro musicians switched from USB 1.1. Even though buying into this new format was more expensive, the switch was well worth it – resulting in added bandwidth and fidelity. In other words, you could track more and the A/D to D/A converters were superior in quality to the USB 1.1 devices. Not until USB 2 arrived did musicians have a choice to either use FireWire or USB 2 without really losing ground on either format. Today, most new computers have built-in FireWire and USB 2 connections on the motherboard, but if not, the FireWire/USB card costs are minimal.

This leads us to today's new breed of hardware that has not only multiple inputs/outputs, but physical surface control (connected via either USB or FireWire). These are the mixer type interfaces that control your software interface. So why are these surface controllers so cool? Well, with one simple example, imagine using a mouse to simultaneously move five faders at one time on screen: you can't! The ability to use your hands to grab faders that move multiple faders on screen is a practical need in mixing applications. With such an interface, there are various other useful and production-oriented applications that apply here.

Also, there are interfaces that incorporate not only analog inputs/outputs but also digital inputs. Two of the most commonly known and used digital inputs are S/PDIF and ADAT. S/PDIF is usually an added bonus on most audio devices, whereas ADAT (or light-pipe) has a protocol and specific cable that can transfer eight tracks of audio simultaneously. Those that are familiar with, or have a closet full of, old Alesis ADAT tapes can easily transfer and re-mix ADAT digital tapes to one's hard drive. This is a time-consuming task but once the transfer is done, the fun begins with visual editing and mixing! (We will examine the five digital audio input/output formats in a future article).

When considering audio interfaces, remember the power in your computer may dictate the logical purchases of external hardware. Itemizing your needs in a production/recording setting is the first step. The entire setup will under perform if not built systematically from ground up. Finally, digital audio interfaces have changed recording techniques forever but the performance plays the most crucial central role in production.

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Electronic Drums 101

by Paul Lau

Recently I had the pleasure of speaking with Ben Volway (Drum Manager of Mother's Music Calgary, www.mothersmusiccalgary.com) to get a practical perspective on electronic and MIDI drums.

PL: Are electronic drums that different from acoustic drums?

BV: The first hurdle is to realize that electronic drums are very different from acoustic drums – almost so much that the transition from one to the other can be very difficult for some. Going from a world of grace notes and sensitivity to a world of triggers and sampled sounds can be quite the adjustment. Not to mention that even with the advanced technology of today's drum manufacturers, no electronic kit has the playability of an acoustic kit and vice versa. Thus begs the question, "So which one is right for me?"

PL: How about the feel and response?

BV: First off, the feel of the acoustic drum skin compared to the electronic pad is miles apart. The drum skin being more flexible, responsive, and dynamically sensitive, also needs replacing after repeated use. The drum pad is based on triggers that can detect volume fluctuation but not tone diversity. As you move away from the centre towards the rim of an acoustic drum, you will notice a very big change in the sound of the drum tone. An electric pad will not mimic that diversity in tone, instead, most pads mistake the stick placement as a volume change.

PL: What are the flexibilities when it comes to sound generation in electronic drums?

BV: As for the range of different drum sounds, most electronic brains offer a wide variety of different drum sounds. You can go from playing a jazz kit to playing a heavy metal kit in just the touch of a button. An acoustic kit sounds like however it is tuned, and to change sounds one has to spend time re-tuning your drumkit.

PL: How about costs in comparison between electronic and acoustic kits?

BV: As per anything you buy in retail, one rule seems to be a consistent: "You get what you pay for." Just like a starter acoustic kit, there are starter electronic kits offered as well. You are still able to spend $500 on a starter electronic drumkit, but it will play like a $500 instrument. If your desire is to have an electronic drumset that has a wide range of diverse sounds while not compromising on the quality of the instrument, the price point will of course be higher – towards the $1,000-$1,500 range. That kind of money can also purchase a good-quality acoustic kit as well. Between the two, pricing is very similar.

PL: What about the practicality of electronic drums?

BV: My answer to that is: it depends on your situation. Electronic kits are great for sound control situations. For example, a person who lives in a condo with paper-thin walls will not benefit from playing an acoustic drumkit at 11 p.m. That person would not be bothering anyone by slapping on a pair of headphones and playing a noiseless electronic kit to their heart's content. Furthermore, as far as studio use goes, they are great. Minimal noise gates and compression need to be used on an electronic kit, if at all. An acoustic kit is much more finicky when it comes to recording. However, most drummers and engineers don't mind the added hassle to get the sounds that they are trying to achieve. On the other hand, in a church setting, the sound person may not share that same sentiment. Instead of spending a great deal of money on drum shields and sound proofing, at the stroke of a fader the electronic kit is put back into the desired context of the music.

PL: Any last words for our readers about deciding on electronic drums?

BV: Remember that practicality depends on the individual. So keep these things in mind in answering the question, "which one is right for me?"

PL: Thanks Ben!

Being a drum programmer myself, and having some limitations in my personal studio in regards to noise, electronic drums – if recorded correctly – can save a lot of time and money. There have been numerous occasions when fixing certain timing issues in a recording can be corrected without notice using an electronic kit. My overall feel about electronic drums is that this is certainly an instrument unto its own; it does not replace a well-miked drumkit in an amazing room, yet can be utilized in practically any situation you would find a real acoustic kit … in the end, my vote is: why not have both?

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Differences Between Audio File Types 101

by Paul Lau

Recently, I received a few e-mails asking for an article explaining the differences between, and definitions of, audio file types. The most common question is, "What should I save it as? And at what bit rate?" Let's go over some common extensions of audio files and what they are. To begin with, .wav was one of the first audio file types developed for the PC, which was created by Microsoft and IBM.

Most people know of this extension or have heard of it and also know that is not a good file format to e-mail ('cause of its size)! .wav files are described as lossless, meaning that files are large and complete; nothing has been lost. It is a file format for storing digital audio .waveform data and supports a variety of bit resolutions, sample rates, and channels of audio. Most musicians just know that when you mix your multi-track music, it's generally mixing it down to a stereo or mono .wav file.

Another familiar file type is MPEG-1 Audio Layer 3, also known as .mp3. This is a common, compressed .wav file and .mp3 files are about 1/10th the size of .wav files. This is why .mp3 players can accommodate hundreds of songs on a tiny amount of storage space. .mp3 is a very common term known by many because of the infamous .mp3 players in an already saturated market of audio devices (we won't get into any promotional branding).

The Windows Media Audio (.wma) was developed to compete with the .mp3 format for Windows Media Player. This media player is generally included on all PCs. Microsoft claims that the .wma files are compressed three times more than .mp3s yet retain their original sound quality (can you tell the difference?).

This leads us to the world of MacIntosh – it has an audio type formatted as an Audio Interchange File (.aif, .aifc or .aiff). Years ago, one of the problems of being able to share files between musicians was that if you were a Mac user and had an .aiff file, you couldn't open it in an audio program that a PC owner was running that just supported .wav. We are way past those issues and nearly all audio editors have multi-type/format of audio files that they can open, which is great news for all!

In the last year, I was exposed to the world of Linux, Open Source, and other audio extensions that I had heard of but not used. Ogg Vorbis (.ogg) is another compressed source code similar to .mp3, but like .wma, more compressed. Ogg Vorbis is also open source (free to all, unlicensed, no strings attached). While .mp3 compresses data at a constant bit rate, .ogg uses a variable bit rate. To explain using an example, say you are copying segments of silence into .mp3 format, the compression bit rate stays the same as if you were compressing the sound of an entire band. But if you are copying segments of silence into .ogg, your compression rate will drop to nothing. The rate varies with the need.

At last another audio extension is the Emblaze Audio (.ea), which was created by Geo and offers compression similar to .mp3 formats, but its purpose is to be played with a JAVA applet – a small Internet program. A lot of online greeting cards often use JAVA applet programs for motion and .ea sound files to play music.

In a nutshell, when it comes to explaining the differences between 16 and 24 bit, I will leave the details to a future article. For now, some say it really doesn't matter as it all ends up 16 bit/44.1. There are many viewpoints, but for me – I would record and save at the highest bit rate for starters as I feel that this would translate as it dithers down and is saved to CD quality.

At the end of the day, can you really hear the difference when you have the ear buds in your ears? For me, if the tune rocks, it's good enough for me – just think about the quality of cassettes … if you can remember way back then!

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Your Computer And Digital Audio Recording Elements

by Paul Lau

So you have this inclination to record some instruments, do some beats, and record your vocals...

Generally, I have e-mails and comments from readers that don't want an article of tech-talk that they don't understand – all they want to know is: How I do it? Can I do it? Will it cost me lots? Is it easy for me to do it? What about the computer I have right now – will it work and what else do I need?

So for those that just want to have a quick overview about computer hardware and software configurations for audio, look no further, because here it is. (I am basing this article on the PC platform.) You are probably part of the population that already has a computer at home, so you're half-way there to do some audio recording. Remember, most computers years ago were not capable of doing any substantial digital audio recording and did not have enough processing power.

Fortunately, these days one can afford off-the-shelf computer systems that usually have one or two large hard drives and at least 1 GB of RAM. Checking audio forums can also give you insight to the latest, greatest motherboards. But it is usually safe to stay with standard name brands for the motherboard (i.e. ASUS), chipset (i.e. Intel – no, I am not endorsed by these companies, but they are stable and if you want more specific model details, just e-mail me), and RAM. How much RAM? At least 1 GB, or if funds permit, 2 GB (what kind of RAM, you ask? Kingston DDR2 should do the trick).

Although there are several choices for Operating Systems, Windows XP is now the industry standard for any audio-based machines and applications. XP is currently at Service Pack 2, which has no compatibility issues with the latest audio software versions. When it comes to Vista, the verdict is still out, so I would wait just a little longer until they work out all the bugs for specific music software programs. The forerunners for Vista in music software compatibility would be Sonar and Cubase. Having a fast processor like a Pentium4 -3.0 GHz is pretty standard these days and quite affordable. A minimum 80 GB of available hard disk space, with drive speeds of 7200 RPM is a requirement.

It's common to see configurations of an 80-120 GB system drive and an additional 120-250 GB audio drive for storing samples and audio session data. The usual set-up for audio computers makes use of at least two hard drives. One drive, the system or C: drive, will only have the OS and all applications installed on it. All other recorded audio data will be saved to other drives. This prevents the C: drive from becoming too full and/or fragmented. External hard drives (Firewire or USB2) are becoming very popular because the data can be easily transported to a different computer and the cost has come down so much that the economics just allows you to do so! So you can have two drives internally and a third as backup quite easily.

Disabling virtual memory should help in the increased efficiency of your computer performance for audio recording. Also by default, Windows saves several "restore points" at periodic intervals. Under normal circumstances, using this feature is a smart idea, but unfortunately, it can pose problems for audio applications. So turning this off will help also! The best solution to maintain a restore point is to image your hard drive using an independent disk imaging application, or creating an image of the entire system drive and saving it either on a CD, DVD, or an extra partition on the hard drive. The computer is a tool that should make it easy for you to create your music and record.

These are just some general guidelines to help you set up a proper digital audio computer based system. Remember, not all computers are created equal, but hopefully should be able to get you where you want to go!

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Internet Radio Part I

by Paul Lau

Over 10 years ago, I wrote an article on internet radio as it first emerged. Times have changed, and technology has become more cost-effective and easier to harness. This time, we'll Q&A with Mike Caseley, VP of Slakrz.com, head of Slakrz Radio, and one of the on-air personalities. We'll follow up with how to set up your own Internet radio broadcast.

CM: What is the history of the company?

MC: It all came together in 2005. My son had just had successful brain surgery for epilepsy. He said he wanted to be a DJ when he got out of the hospital, so I acquired all the needed equipment and we started playing anything we could get or hands on for music. Working closely with Michael Halverson, Sean Spicer, and Brendan Lough, we came up with the idea of Slakrz and what we wanted to do.

We started doing live broadcasts of independent bands from a club in Calgary every Thursday, Friday, and Saturday. We noticed how closed-minded this community was toward the independent scene – that is when we decided to stream nothing but Canadian independent bands. In 2006 we became our own online community with a tag line: 'Supporting Independent art, music, and thought through as many new and innovative avenues as possible.'

CM: What is Slakrz Radio?

MC: Slakrz Radio is an online radio station focusing on strictly Canadian independent music. You will find videos, interviews, info on events, and many-up-and-coming bands. We broadcast 24/7, 365. You can listen to all genres of music and know you have not heard stuff like this before. We first started streaming using Winamp, a ShoutCast encoder, and a DNAS server on our own Internet connection on an audio stream of 128 kbps. Because we were doing it this way, we could handle about 32 listeners – but not for very long periods. We could have lowered our stream quality from 128kbps to something as low as 24 kbps, but, sorry, music is about quality.

A few months later we learned about servers. We pay them $43 per month and we now only stream our stream to them – and they handle all of our listeners. They also give us detailed stat counts.

Now, I would not say that streaming is difficult. Anyone could do it. If someone asked how to do it, I would suggest contacting a station and get on as a DJ – you will learn what you need to have a start to a listener base. The difficult part comes when you are working on trying to get the listeners. As with any product, you have to assure people that it is the real thing – you are not just someone pretending.

I would also add that choosing the path and content that we would play made it a little difficult. We are based in Calgary, so we have many bands from the Calgary scene but also many from across Canada. In the beginning, we had to search for the music – Myspace was a great tool and put us on the road to where we are. We still use Myspace, but we have grown by word of mouth as to the way we are getting music. Currently, we have about 300 bands that you could hear on regular rotation and we're always adding more. We have been able to master our on location streaming with help from our Internet provider; we can go anywhere in Calgary and other cities across Canada and have Internet. This way, we do not need to be worried about whether or not the bar the band is playing at has Internet. On the other hand, we did this Summer when we put on concerts in the park all live on Internet radio, and the live interview show from Mothers Music Calgary.

You can hear cool independent music streamed on the Internet at www.slakrz.com as well as all the other cool things that Slakrz does for the independent music scene in Canada.

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Internet Radio Part II

How To Start An Internet Radio Station

by Paul Lau

Last time, we interviewed Mike Caseley, VP of Slakrz.com, to get a feel for how a real Canadian independent Internet radio station is started and run. As promised, we'll now give you a primer giving an overview of the components that make up an Internet radio station. But before we delve into this, I should at least mention that broadcasting music that is not yours has some legal issues … such as, you're not allowed! Caseley has agreements for play with up-and-coming Canadian bands, so he has permission to broadcast their songs on his Internet radio station. In having your own Internet station, one should be respectful of using music that is not yours to broadcast, hence the words "royalties," and "licensing fees." Perhaps our music legal beagles would write on this in more depth for an upcoming issue?

Anyway, the basics about Internet radio can be divided into five parts or components: computer hardware, PA (audio hardware – mixer, mics, speaker/monitor), multiple audio software packages, Internet Service Provider (ISP), and musical content.

All you really need is one good computer. Let's call it the Production Studio Computer, i.e. a computer that can record, burn CDs, edit audio, create playlists, and do voice tracking. As the entire music and playlist can be done with this computer, it can also be the On-Air Studio Computer, but please note that it also has to have the capabilities and resources to multi-task listening events. What does this mean? For example: one would need an audio playback device/card for the audio output for the playlist; then you would also need a sub-out for pre-listening/cueing; and, last but not least, the input audio for Windows Media Encoder. Some may suggest that having a home studio computer is all you need, but according to Caseley at Slakrz, they are sporting a laptop for the convenience of mobility to do the live broadcast, and they do the production/editing at a home studio with a different computer.

Please note that the bit-rate is very important – the higher the quality, the more bandwidth needed. As a note of interest, Windows Media Streaming (WMA), which is a stereo stream at 64 kbps, has almost the same quality as FM radio. If you double this to 128 kbps, we're hearing near CD quality. As Caseley said last time, they were losing some listener volume because of the higher bit rate cutting into their bandwidth of listeners, but they were not willing to go to a lower quality to allow more listeners. They were more about the quality of the music when listeners actually tuned in. Which means that they would get a higher quality sound.

I would agree with this choice; if I was listening to bad or intermittent-static sound, I'd probably just turn it to another station until I found something clear! For those looking for Internet radio software, playlist creation, etc., some brands such as Pirate Radio, Radio Automation, and SAM Broadcaster come to mind.

For most, just using your home Internet connection would suffice, but for Slakrz, having a wireless and mobile Internet set-up is perfect for the on-air live broadcast in different locations. All you need is a power source and to plug in the Internet modem and hook up the wireless router, and presto: "Live-to-Internet-Air." It would be handy having a 4- to 8-channel mixer, into which you could plug a mic for the announcer and have another one or two mics for the musicians being interviewed, and maybe a few other mics for the instruments if you are doing live performance.

Slakrz used pre-recorded CDs of the artist interviewed and just played/streamed them via with a CD player hooked up via the mixer into the laptop during the breaks of the interviews. In the end, to have the ability to reach many listeners you would need an Internet Service Provider (ISP). There are many services that want your monthly dollar that specialize in streaming audio for this purpose. They are also called audio streaming providers. Usually, this is a nominal cost – but not cheap, so do shop around.

For me, the most important part of having an Internet radio station is the content. The thing that I like about what Caseley is doing at Skakrz is that the content is from up-and-coming Canadian bands that don't get exposure in the mainstream (no pun intended). Why do you want to start your own station? For me, it's simply to share and enjoy music!

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Virtual Instruments

by Eric Price

Let's take a fresh look into the world of virtual instruments, often referred to as software synthesizers or softsynths for short.

Virtual instruments are instruments created inside your computer using only software with no external hardware other than a soundcard so you can hear the sounds. These synthesizers can be run as stand-alone programs or be integrated into your digital audio sequencer.

Softsynths create their sounds by using analog, digital, or physical modeling: emulations based on samples or hybrids of any of these technologies. They can come as authentic recreations of vintage instruments, reproductions of traditional instruments, or totally new synthesizers generating all new sounds. By utilizing the processing power of today's computers, they can easily rival the complexity of any hardware-based synth, sounding both amazing and accurate.

Let's go over some of the pros and cons of this software realm.

For the virtual world, the obvious advantage here is space. Unless you are wealthy and can afford to own your own warehouse that is properly heated, humidified, and outfitted with an alarm system, then you are a good candidate for softsynths.

Space is often at a premium. Most of us these days are ensconced in our own home studio (read spare bedroom) and by the time you fill it with all your other cool toys there's often not much room left for any instrument that may only be used occasionally – and of course that also means no room for an 80-piece orchestra either!

How about recording real drums? You'll never get a John Bonham drum sound in a 10' x 10' room where recording drums is usually not even practical (if you're lucky to have a room any bigger than that, your spouse must really love you!). Not to mention, like many of us, you're likely to get that inspiration for your next tune at 3 a.m. while someone is trying to sleep in the next room. Not a problem with a virtual synth!

Next argument is time and money. Do you ever need an exotic instrument such as a dobro or ulian pipes? Do you have the time and money to buy a new instrument and learn it? What about an orchestra or killer horn section? Does your budget allow for hiring session players? Are there enough good players available locally? What about maintaining all your instruments? Do you know any local repair guys that can fix them or for vintage gear, even get parts?

One final observation on the money issue: for the cost of one mint condition Hammond B3 organ with a Leslie these days you could buy yourself one awesome collection of virtual synths!

Another point for virtual synths is that they are simply more powerful and more flexible. The programs often have features that the original synths or instruments were incapable of such as extended note range, more polyphony or MIDI, which can also be saved and edited. Never mind having thousands of sounds at your immediate disposal. The software can be upgraded, adding new features and taking advantage of enhanced programming and faster computers allowing for even more accurate realizations. Softsynths are sounding better all the time with more variety being available on a regular basis.

Lastly, consider the fact that the average music listener can't tell the difference between a Rhodes and a Wurlitzer electric piano and combined with the fact that they listen to music through ear buds using a file system (MP3) with incredibly reduced fidelity means very few people can distinguish between real and virtual instruments.

Now a few things to need be said for real instruments and players.

First off, there are performance plusses for real instruments and players. You can never capture all the nuances of a great violin, guitar, or sax player while using a keyboard and software, let alone their individual styles.

Secondly … timbres. With vintage keyboards, say electric pianos and organs, each keyboard has its own tonal

personality. What about all the variations of tones in a single ride cymbal, for example? These quirks, which we as musicians often find inspiring, are exploited by us. Programmers go to great lengths to try emulating them and although powerful software allows for many variations there is still a limit to what the software is capable of.

Lastly, knobs and buttons have their appeal – it's hard to beat the immediacy of controls at your fingertips. I know you can get control interfaces, but it's just not the same effect. Besides, there is the cool visual factor, too!

Love them or hate them, softsynths are here to stay and despite the arguments for both sides I suspect almost every computer user reading this article has a virtual instrument installed. For most of us, virtual synths are a very practical way to go.

Eric Price can often be found tinkering well into the night with his hoard of virtual instruments. He is currently performing with Pink Floyd Niagara. He also teaches and consults, helping musicians get the most from their computers. He can be reached at eric@gepconsulting.ca.

USB vs. FireWire … The Test Of The Titans

by Paul Lau

Recently, there has been a buzz and a few questions from our readers about comparing USB to FireWire connectivity, and how it affects the audio stream of information. Is there really a difference in the music manufacturer's audio interfaces, whether it is USB or FireWire?

Before we get started on the two main players in this article, we should take a step back to where all this began with a primer about Peripheral Component Interconnect (PCI). Many of you may have heard the term "bus" – this refers to the path or channel between the components in a computer. Bus speed is one of the issues we will be looking at when we delve into USB and FireWire comparisons. During the early '90s, the introduction of PCI cards allowed new devices to be connected to the motherboard. The first connecting PCI cards and break-out boxes were for MIDI applications only; there were no audio devices/interfaces as of yet and MIDI ruled. Eventually, the PCI cards did include audio interfacing. These cards are still available but are not as popular as the new USB and FireWire connectivity devices. The PCI cards had direct inputs on the card or had a cable connecting to a break-out box. Advancement of these break-out boxes bred interfaces that had up to eight inputs. Slowly, with the advent of USB 1.0 in the mid-1990s, PCI interfaces started falling off as the interface connectivity of choice.

USB is the acronym for Universal Serial Bus; originally USB replaced serial and parallel ports with a plug-and-play capability for many computer devices i.e. mice, keyboards, and printers to name just a few. USB supports three data rates: Low, Full, and Hi-Speed. USB 2.0 is the Hi-Speed USB connectivity we are referring to and has a transmission rate of 480 Mbits/s, which is about 40 times faster than USB 1.0. With this new Hi-Speed rate, which was introduced during 2000, many more music manufacturers started to produce multi-input audio interfaces with USB 2.0 connectivity. USB is more commonly found on all motherboards as opposed to FireWire. With that said, there are many motherboards that have FireWire connectivity and, if needed, a FireWire card can be purchased for about $50. FireWire, on the other hand, is rated at a number of speeds. Presently with the audio devices in today's marketplace, we concern ourselves with FireWire 400 with a speed rate of 400 Mbit/s (but also there are interfaces that recognize FireWire 800). The other speeds are FireWire 800, S1600, and S3200.

So is USB 2.0, which it is rated 80 Mbits/s faster than FireWire 400, better?

It has been tested that sustained throughput through FireWire is faster than USB. The reason for this is the way the information is treated. FireWire uses a peer-to-peer construct and USB uses a master-slave design. How these differ from each other is that the FireWire devices negotiate bus conflicts intelligently, so we have great, uninterrupted flow-through, whereas USB allows the computer to determine this function, causing a slower data flow. With that said, is USB much slower than FireWire? The answer is relatively … no. Even though I lean towards FireWire connectivity, I feel both are equally poised. When considering which connectivity to use in a musical audio interface application, there is a large selection in the market place and it can be quite daunting. Some areas to consider other than the connectivity is the actual interface, and how many inputs you are using simultaneously. With the ease of connecting multiple interfaces slaved together, it does not mean we will be getting all the track uses automatically. A lot has to do with how much RAM your computer possesses and the CPU processing speed. Just selecting USB 2.0 or FireWire is not the only consideration. Another point to consider is what type of physical inputs are being used, i.e. what type of mic pres and how good they are. Does the unit have phantom power for condenser mics? As well as the A-D D-A (analog-digital digital-analog) converters inside the audio device, this is where it all happens in making your sound transparent, clear, and great – or not. In the future, there will be the development of USB 3.0, with the Super-Speed rate of 4.8 Gbit/s which will be 10 times faster than USB 2.0, but FireWire is still forging ahead with predicted speed rates up to 6.4 Gbit/s. What does this mean to the average musician?

Simply put, technology will allow us to record more tracks without bottlenecking and stifling our creativity with the proverbial technical pitfalls of computer recording.

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Adding The Juice To Your Vocals – Live!

by Paul Lau

It's ear candy when a lead singer has live backup harmonies rockin' the song! There are generally three types of singers for the purposes of this column: melodic singers, harmony singers, and the cats that can do both. Here's the problem: if you are the only singer in your band, or you are doing a solo act and your own sister won't sing with ya, how do you juice your vocals with harmonies? In a recording situation, copying and pasting one's own vocal track is a well-known trick to create harmonies and chorus effects with just one singer. Current software with this specific feature application has been available for awhile and this technique is used readily (and will be a topic for a future article), but how can it be done in a live performance, and done easily?

Recently, a few leading-edge companies have developed effects processors and vocal harmonizers to solve this problem. When the first vocal harmonizers came onto the market, they seemed gimmicky and quite difficult to set up. The actual harmonies created were sometimes a little "mechanical" sounding for my taste. The older units also ran into a scaling problem where the harmonies just didn't sound correct due to the same notes being sung over different chords, which did not make musical sense. The latest crop of vocal harmonizers generates live multi-parts by reading and analyzing guitar chord progressions. They produce cool algorithms, which in turn produce a cool harmony part; therefore, the tracking and producing of a harmony is not just from a reference of a single note from your voice but by the actual chords played on a guitar simultaneously with your voice.

Another issue with the older harmonizing units was that you had to program the chord changes individually, which was very tedious. The new units allow you to literally just plug and play. Plug in your mic and guitar and pick a 3rd or 5th interval above or below of a harmony preset and presto – just step on the footswitch when you want the harmony part to kick in. Now it may sound simple and it is, but there is a coordination issue … kind of like rubbing your stomach and patting your head at the same time. If you step on the footswitch at the wrong time, there won't be harmony at the right spot, and you must trigger the harmonies with the guitar first just before you sing, which is very important to get the proper key harmony. Trying it myself, it took a little while getting used to, as I am a keyboardist first and a guitarist second. The transition from dry vocals involves turning the footswitch on, strumming a chord, and singing – making it smooth and seamless is the trick. In short, if you've got rhythm … no worries.

These units allow you to produce multi-harmony with multi-effects, i.e. reverb and delay, EQ, and chorusing – everything you need in a vocal track. These units also include studio-quality mic preamps with phantom power (if needed) and also have a guitar tuner to boot. On a side note, in conjunction with these harmony units, there are new-generation auto-pitch correction units available. Having one of these in the chain would be a very worthwhile investment. Imagine if

your pitch is off and you sing off-key; it will sound bad, and doubly bad if you have harmonies following off-key singing. I'll leave the auto-pitch correction units for another day.

Have we found the Holy Grail for Instant Live Vocal Harmonies? You decide. I've included two leading companies in this field with their cool products being demonstrated via YouTube links, so you can actually hear what I'm writing about:
www.youtube.com/watch?v=g7NqPYZWTJI&feature=related
www.youtube.com/watch?v=d4-SYz3_BCA&feature=related

I was fortunate enough to see and hear these demos live at NAMM 2008 and I was really impressed to the nth degree at the natural vocal harmonies that these units produced. The accuracy and ease astounded me. I can't wait to hear about the future development of more multiple harmony intervals and complex harmony algorithms from these companies. So, for all you solo artists out there – you are not alone. Juicing your vocals is just a chord away!

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Why Still MIDI?

by Paul Lau

With the advent of digital audio, is Musical Instrument Digital Interface (MIDI) obsolete? Not by a long shot. Let's review MIDI and see how the technology of yesterday still remains current and effective in modern music production.

It's been over 20 years since the beginnings of MIDI, but has it changed that much? In the beginning, all keyboards were self-contained, and playing two separate keyboards at one time with two hands was just rock n' roll! MIDI changed all of that. What MIDI allowed you to do was to play two keyboards simultaneously with just one hand – it was called "stacking" the sound. A favourite combination for many was the piano patch plus underlying strings, or the acoustic piano plus electric piano combo. From the start, the technology evolved from a uni-timbral keyboard (one keyboard transmitting one sound at a time) to a multi-timbral keyboard (one keyboard transmitting multiple sounds at one time), but there were limitations such as the number of notes that could be played at the same time. Hence, the "polyphony race" for which manufacturer could get the most notes playing simultaneously with the maxed 16 MIDI channels or sounds started shortly thereafter. Well, with keyboards currently at 128-note polyphony, one doesn't really have to think about running out of simultaneously-playing notes.

With that said, sequencing software has always been ahead of the game and capable of leading these MIDI devices to higher levels. So, here we have keyboards or sound modules with 16 parts or 16 sounds, but please note: without the sequencing software, you can't tap into this nirvana of personal music production. Music software products are the backbone of music production and all current studios. Sequencing software, in lay terms, clones your playing multiple times and plays back the notes simultaneously. This sequencing software has so many advantages for the musician in that it allows one to record note-by-note and to auto-correct time performances by quantization so they are perfect. Now this a little odd, in that being perfect actually doesn't sound that great (it actually sounds kind of robotic), hence humanization of this perfected quantization via groove templates (natural pushes and pulls of beats and notes) were created to remedy this perfection.

I remember when Ray Williams of Music Marketing asked me to review and present the first article in the world about the DNA groove templates for quantization (published in *CM*); this ground-breaking technology allowed you to take the "human feel factor" of a captured MIDI performance and place it on another performance of a completely different piece of music via MIDI. This was a tremendous milestone for the evolution of MIDI: the humanization of quantization. MIDI is still a great tool for any musician who wants to effectively change and manipulate time signatures and multiple tones without committing to digital format. Originally, "folding back the MIDI" was a term used to take the MIDI performance and create a .WAV or .AIFF file. The concept took a bit of going over, but once you had your 4-bus mixer hooked up and the cables routed back into the mixer, then into the interface, then into the computer – presto! – MIDI performance converted into digital audio file. Hence, the second milestone in the evolution of MIDI happened when software could export a MIDI track to audio instantaneously. This meant no more folding back; just let the software do it! And, of course, this developed into being able to export to multiple audio formats, especially MP3. In the last couple of years, the 5-pin protocol has begun to disappear from the back of a number of keyboards and USB connections for keyboards began to appear. But, no fear! MIDI is still being used via the USB connect.

Are you still wondering, "Why MIDI?" MIDI allows you to create a band sound without a band, correct and quantize your measures to perfection, easily arrange and re-arrange your orchestrations, and, at the same time, print out every single note. For me, it is these capabilities and more that are attractive, but there is one element in all of MIDI that answers the question in point: the inspiration it can create for composing music. In the end, it is a tool like the hammer – it'll always just be here!

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The Yin & Yang Of Digital Audio Formats

by Paul Lau

Throughout the years, have you ever noticed how manufacturers produce so many choices in audio/video formats? For example: cassettes had Normal or CrO^2, videotape had VHS or Beta, and now DVDs have either conventional or Blu-Ray. The list goes on. In general, for audio formats, there is an extensive history of different types and are too many to be confined in a one-page article. For musicians that are using either a PC or Mac for recording, I will touch on one of the most-asked questions: "What audio format should I use or save as?"

The most familiar audio format is the .WAV (Waveform Audio Format). This is the standard audio file used mainly in Windows PCs. These are usually found as 16- or 24-bit files, with some sample rates ranging from 44.1 kHz to 192 kHz. This file is mainly used to store uncompressed PCM, CD-quality sound files. For Mac users, the standard audio file is AIFF (Audio Interchange File Format). So how do we save either file formats? Both .WAV and AIFF should be saved as Redbook-compatible formats. What is Redbook, you may ask? Redbook, co-developed by Philips and Sony, is the standard for audio CDs. CD players play Redbook format. When saving, you will be saving your file or dithering to 16-bit, 44.1 kHz so it can be played in a CD player!

Here's a quick size calculation for a three-minute song: **two channels x 5 MB x 3 min. = 30 MB** of hard drive space. Most musicians automatically create a folder in the C: drive and save everything there or put it on the desktop – I did when I first started and sometimes that's all you can do. Nowadays, with external drives at such an affordable cost, there is no reason not to have a secondary drive, or even a third to back up to. So, to recap on file placement and storage, the C: drive is good for the OS and program files, a secondary D: drive is great for the audio files, and a third E: drive, if available, is for back up to. (Oh yeah, should it be a FireWire or USB2 drive? Check out my Digital Music column "FireWire vs. USB" in *CM* July/August '08.)

What you will find within all audio software sequencers is that there is a "save as" option, usually under "export" for the bit file and sample rate, regardless if it is .WAV or AIFF, so you can set it to the needed resolution when mixing down. Now, is there a difference between a .WAV and AIFF file? Not really. A .WAV file and AIFF file of the same audio will actually be very similar (you really can't hear the difference), and the only difference is the header and footer of the file. I've noticed recently, and it's probably more evident on the Mac user side, that you can save either .WAV or AIFF on either platform. Macs have been very advanced in being able to create Windows environments with Bootcamp or VM (virtual machine) software, giving you the best of both worlds if needed, whereas Windows does not create a Mac environment in its platform (but that's a whole other article).

The MPEG-1 (Moving Pictures Experts Group) Audio Layer-3 format (more commonly known as MP3) is the most

popular format for downloading and storing music. What happens here is the elimination of portions of the audio file that are essentially inaudible. The MP3 files are compressed to roughly 1/10 the size of an equivalent PCM file or CD file, while maintaining good audio quality. Most all Internet music sites only allow MP3 songs for obvious reasons – when it comes to transfer speed and storage of MP3s, this is the most efficient format to use. So does the file format make a good recording? Not as much as the file format's resolution, so theoretically, the higher the resolution, the better the quality! This is only part of the equation; the hardware and input instrumentation also play a crucial role.

The quality of the A/D-D/A converters in your interface determines, to a great extent, how well the software will process the analog recording. With that said, I believe we may have hit a ceiling. The quality of the hardware and software, regardless of format, is so good these days that we've come full circle. For example: in a recording, I've heard singers sing off-key, which creates a bad recording even though it was recorded in a million-dollar studio. In the end, as I have always asked, is it the technology that leads you or the music? Let the music lead you and use the technology as a tool to present what you want to perform and say in the best way!

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Digital Handheld Recorder Primer

by Eric Price

Though handheld recorders have been around for decades, initially in cassette format, they have really hit their stride in the last several years. Let's look into the mini-revolution taking place, literally, in the palm of our hands.

Originally, hand-held recorders, with the convenience of quickly being able to capture a conversation, rapidly became crucial to stenographers and journalists alike. The lack of audio fidelity meant they were nowhere near suitable enough for realistic musical production, and these types of devices were mostly ignored by the music community.

Over time, as with any technology, they improved in fidelity and diminished in scale, making them even more affordable, versatile, and practical. They now began showing up in the hands of concert bootleggers, songwriters, and sound engineers who were looking to capture sound effects in the field.

Still based on tape storage at this point, either a cassette variation or the now nearly-forgotten DAT tape, there were still limits to their scalability and robustness. With the introduction of DAT tape they could at least record digitally, which led to a dramatic improvement in fidelity.

Concurrently, microphone technology was starting to catch up. Small, inexpensive, high-quality mic capsules began to permeate the industry, thus allowing for professional-grade condenser mics to be included at low cost.

The last technological hurdle to overcome was storage. With the advent of cheap RAM and small-scale storage cards, allowing for hours of CD or better-than-CD quality recording, the circle was complete.

This brings us to where we are today: the digital hand-held recorder with stereo, first-rate condenser mics capable of recording several hours worth of CD-quality audio at a very affordable cost.

The explosion of choices is staggering. All the major manufacturers have a digital recorder in their product lineup, as well as many second-tier companies. Prices range from under $100 for pocket-sized, lo-fi versions to thousands of dollars for professional field recording models that hover on the brink of the handheld classification. Most decent brand name models fall between the $300-$500 mark.

Obviously, your application will dictate your needs, but I am going to address our core readers here – the musicians. Let's visit some important points to consider when shopping for a recorder.

First off, any recorder may do the job, but consider this: fidelity will make your recordings more valuable. Better fidelity means you stand a better chance of properly hearing what you played. If you are a songwriter at the piano, for example, having a decent recording of the song will help you more readily interpret your intentions when it comes time to re-record the song, especially when you or a third party will be creating a professional demo of the song.

Good quality recordings are important even if your band is simply capturing rehearsals, jams, or new tunes. What about a live, bootleg recording of your band? Having a high-fidelity recording would allow you to put the track up on the Internet immediately without you having to perform any serious audio surgery.

The message here: don't skimp on **fidelity**; accept and use nothing less than CD quality!

Make sure you get a unit with detailed **level** monitoring. Most units feature multi-segmented LCD displays that can help give you fairly accurate levels. Two or three coloured LEDs just don't cut it here. You need to make sure your recording level is high enough or that your signal is not too hot – there's nothing worse than trying to re-capture the moment because your levels are unworkable.

Battery life. The new Yamaha recorder, for example, boasts a 50-hour recording/playing cycle on a single AA battery – that's impressive to be sure. Most models allow for hours of recording using inexpensive batteries, so this shouldn't be too much of an issue. Remember that it never hurts to a have a spare set of batteries on hand.

Data retrieval. With most recorders having some form of onboard memory built in, a USB or FireWire connection is paramount. You don't want to be re-recording the audio through analog outputs as this defeats the purpose of having a digital recorder. Alternatively, most recorders will have some form of a memory card option such as a Compact Flash or SD card. Hopefully, your computer has a card reader. If not, you can buy a USB card reader to add to your computer for under $30. Remember to make sure the reader supports your memory card format!

Mic configuration. Stereo condenser goes without saying – I prefer the mics to be in the X-Y arrangement for better spatial imaging and fewer phasing issues.

Lastly, a mic stand **mount**. My Zoom H4 came with a small plastic piece that screwed into the bottom of the recorder and allowed the unit to easily fit into a standard mic clip. This feature is very handy indeed.

Eric Price can often be found singing and playing into his digital handheld recorder. He is a member of Pink Floyd Niagara. He also teaches and consults, helping musicians get the most from their computers. He can be reached at eric@gepconsulting.ca

The DNA Of Audio

by Paul Lau

One of the milestones of MIDI was the ability to groove-quantize the feel factor of a MIDI sequence. Using software, it was rather cool to be able to just go to the note and adjust to the corrected note, and slide it back and forth for timing issues or feel factor. This allowed you to have a more realistic sound and create a passage of music not so robotic or perfect. Also, if you couldn't really play or perform the part that fast, changing tempo is a snap. Presto! You're hearing lines that you actually can't play.

Some think of this as cheating; I call it "spontaneous, intuitive creation using the technological tools at your disposal." So what would be next? Where would music technology lead us into the manipulation of sound files? What about an audio file?

You may have read my last column: The Yin & Yang Of Digital Audio. Most refer to audio or WAV files with an extension such as .wav or .aiff. If you're part of the Linux crowd, it would be referred to as a .ogg file. For many years, there have been hardware-based pitch correction devices that enhance live performance. When performing and singing live, the unit instantaneously tracks and corrects pitch. These units range from $300-$1,500. And for even longer, there has been a mountain of processing units that have effects such as delay, reverb, chorus, and all sorts of goodies that can enhance whole songs or individual parts.

For the last number of years, music software technology has allowed you to be able to zero in on individual WAV files, dividing the actual words sung, and the pitch and duration. With this visual editable ability, one can easily manipulate the audio file. The actual audio file can be pitch-corrected with a mouse movement similar to the manipulation of a MIDI note; this would include note durations, either lengthening or shorting the value.

What about copying the actual audio part? And then pasting a 3rd interval and copying above the original note? Absolutely! Hence, you would have automatic harmony, even a 5th and so on, creating automatic back-ups and a choir effect – all this originating from one voice. So now, if one can do that, what about sliding the 3rd interval back a very small amount? You can create an automatic chorus effect – now, isn't that just cool? Here, it isn't as much as what the music software technology can do, but more about the musicality and end result of how you use it. Imagine creating a 2nd interval above a tonic voice. Well, it just clashes and doesn't sound right (unless that's your effect), so a bit of musicality and ingenuity does count for the creativity process.

Recently, music software technology has begun to cross another threshold, passing another milestone. When you see a one-note WAV file and move its pitch up or down, that's

quite amazing. But what about a chord? When you strum or play and record a three-note chord, it's just a giant WAV file, but the whole file can still be pitched up or down, too. What if you could see the individual WAV files of each note in the WAV file? If you played and recorded a C major triad (C,E,G), but you really wanted a minor chord, wouldn't it be great if you could just reach in that WAV file and move that E to an E♭ with the click of a mouse? Well, we've just crossed that bridge with new technology called Direct Note Access. Sometimes, it's just easier to see it and hear what I'm writing about, so if you have your Internet ready, just plug in these co-ordinates to have your mind blown away with the latest technological marvel in audio file manipulation: www.celemony.com/cms/index.php?id=dna.

The DNA Of Audio was something I wanted to pen for a long time, but actually, the DNA Of Audio lies within you. The notes you record, perform, or sing all originate from you, so when technology allows you to correct your mistakes instantaneously, and create perfectly-pitched harmonic intervals, I'm thinking … why not play it again? Or why not try to create your own intervals and harmonies as humanly imperfect? The word I think that is needed here is "balance." One has to decide, when using such amazing technology, how much of this technology we subject our artform to, so we don't lose it to non-human creation. I've always said, "Don't let technology lead you, but use technology to open the door to creativity – and the key to the door is inspiration!"

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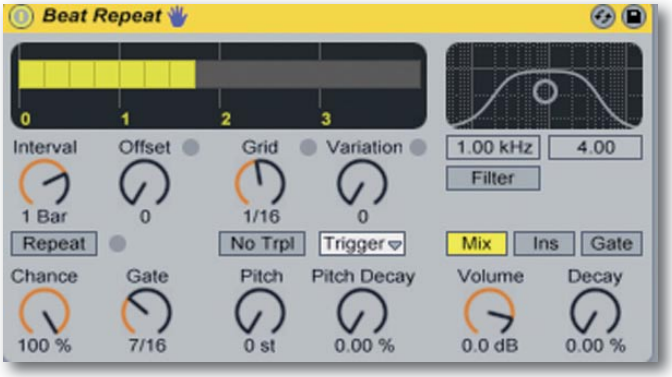
by Morgan Pottruff

ReWire SLAVERY

I've often found Ableton Live to be bit of dark horse with my audio production students and colleagues alike. Most of them have little familiarity with it, often thinking of it as some kind of DAW for laptop-carrying techno geeks, and certainly not something that's going to distract them from their ongoing love affair with their "normal" DAW, be it Pro Tools, Logic, Cubase, or whatever. (Discussing DAWS is like comparative religion but that's another article!)

Fortunately it's not an either-or scenario though. Live is the only program out there that is a DAW (ReWire host) and is also a ReWire slave. So today, I'll give you a couple of examples of how we can use Live as a ReWire slave to do tweaks on loops that would be difficult or downright impossible to do in your "normal" DAW.

First off, lets talk about stutter FX. You hear them everywhere on today's production on pop vocals and drums. Oh sure, you could do them manually in your DAW – cutting, chopping, and crossfading your life away or you can give Live's Beat Repeat plug-in a whirl, which I guarantee will be a whole lot easier and a ton more fun.



LIVE'S BEAT REPEAT

Using Beat Repeat is a no-brainer. Just put the plug-in on the track with the loop you want to tweak out, and the plug-in spits out lovely bits of chaos with minimal fuss. Just set the interval, which governs how often Beat Repeat samples the beat and begins repeating it. The stutters come out tempo-synched as governed by the grid command (quarter note, eighth note, etc.). From there, it's easy to route the track output to an adjacent track and make perfectly-cut loops filled with glitchy stutter-effected goodness. Since there is a good amount of randomization that's involved here, I like to record a number of loops and wait until something cool happens – you'll know it when you hear it.

If we really want to go the extra distance, we can process them in real time with some of Live's effects. You can assign real-time control using your control surface or keyboard controller. If you click on the MIDI button, it's a simple click of the loop, and put them wherever the fills should naturally be.

In Live, you have something called clip automation. It's kind of like track automation like you'd have in another DAW, but it allows you to do tweaks on the loops themselves over and above what might be happening at the track level. As you can see, draw-in changes in the offset (the place where the sample begins playback) and that will effectively scramble the beats.

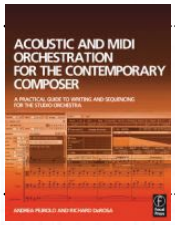
TWEAKING SAMPLE OFFSET

Also, because Live is all about time stretching, we can make tiny pitch changes on each transient to add some chaos to our loops. This is also cool to use if there happens to be a melodic part of a sample that isn't perfectly in-key with your song! This has definitely taken some of my loops or samples out of the "pretty cool, almost works, but not really" column into the "I can actually use that" column. Instead of a pitch curve, we can also use volume to turn down sections of the sample to change the feel and give us a new-sounding loop.

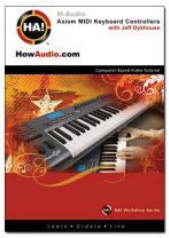
FUN WITH CLIP TRANSPOSE!

So there are some examples, but they're just the tip of the iceberg. There are literally hundreds of other things I could have mentioned in this article. Be sure to check out examples on YouTube, which show what you can do with this program, not to mention tutorial DVDs you can pick up on the topic (like mine)! Remember, it's not just for the dance music crowd. I've introduced Live to many heavy metal guys who have gone on to discover an inner Trent Reznor they never knew they had, and felt much better off for it.

RECOMMENDED READING



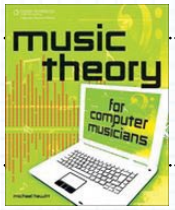
ACOUSTIC & MIDI ORCHESTRATION FOR THE CONTEMPORARY COMPOSER BY ANDREA PEJROLO, RICHARD DEROSA
You will learn how to integrate the traditional approach to orchestration with the modern sequencing techniques and tools available.
http://musicbooksplus.com/bacoustic-midi-orchestration-contemporary-composer-p-9338.html



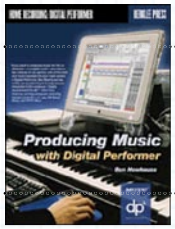
AXIOM MIDI KEYBOARD CONTROLLERS DVD BY JEFF DYKHOUSE
Jeff Dykhouse demonstrates the power and flexibility of the Axiom 61 advanced 61-key USB mobile MIDI controller.
http://musicbooksplus.com/axiom-midi-keyboard-controllers-p-10087.html

CREATING DIGITAL MUSIC AND SOUND BY CHRIS MIDDLETON
An inspirational introduction for musicians, web designers, animators, videomakers, and game designers.
http://musicbooksplus.com/creating-digital-music-sound-p-7249.html

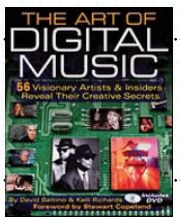
HOW MIDI WORKS — 6TH EDITION BY PETER LAWRENCE ALEXANDER
This book takes readers all the way through MIDI, sequencing and digital audio recording, and features chapter summary questions to ensure understanding.
http://musicbooksplus.com/midi-works-edition-p-2953.html



MUSIC THEORY FOR COMPUTER MUSICIANS BY MICHAEL HEWITT
Concepts are taught using the MIDI keyboard environment and today's computer composing and recording software.
http://musicbooksplus.com/bmusic-theory-computer-musicians-p-9969.html



PRODUCING MUSIC WITH DIGITAL PERFORMER BY BEN NEWHOUSE
This is a comprehensive guide to the features and strategies behind one of the most powerful pieces of music production software.
http://musicbooksplus.com/bproducing-music-with-digital-performerb-p-5402.html



THE ART OF DIGITAL MUSIC BY DAVID BATTINO, STEWART COPELAND
You'll learn studio setup tips, secrets of sampling, creative quantization, ringtone tricks, production strategies, insights from video-game composers, insane distortion recipes … and much more.
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