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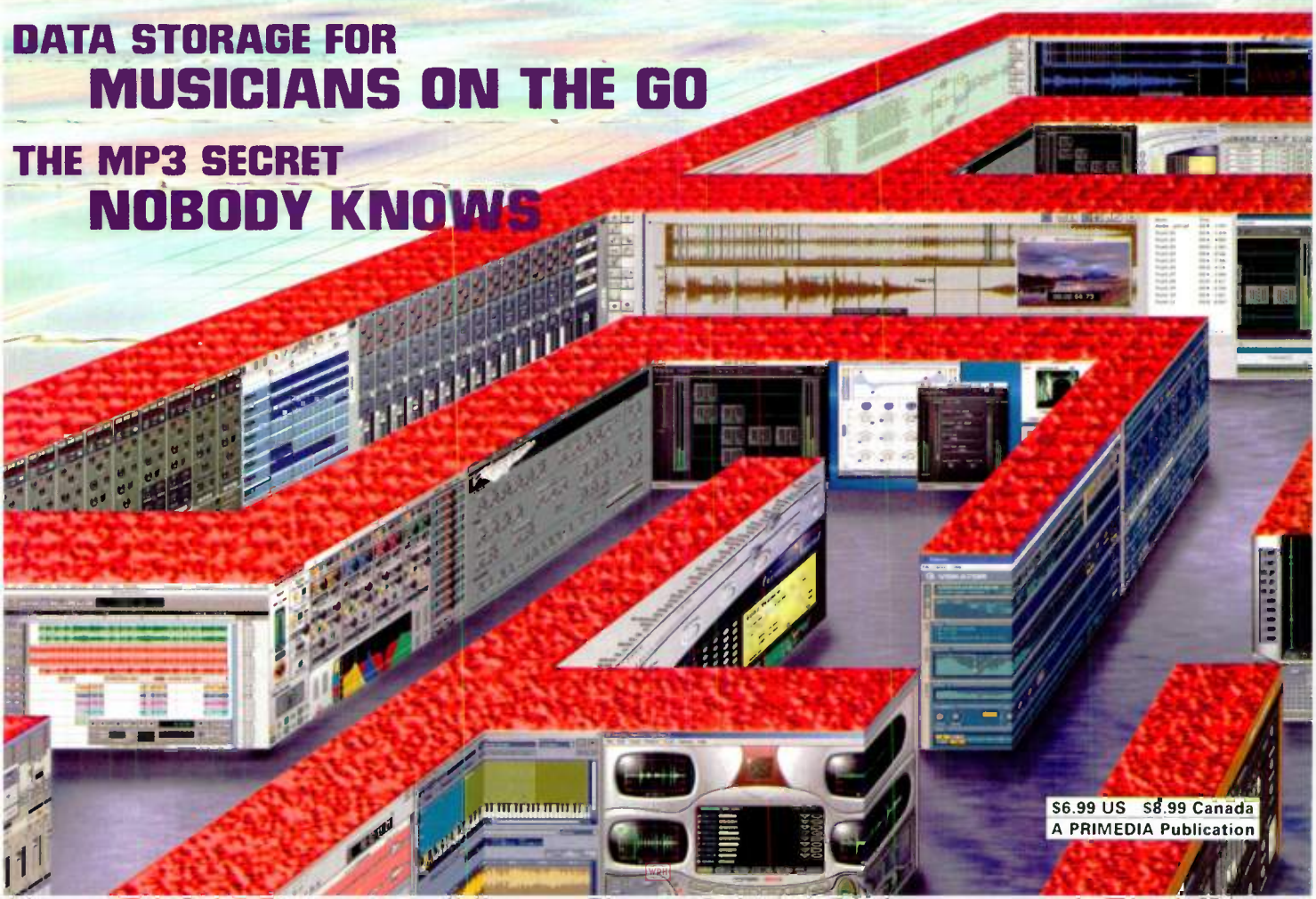
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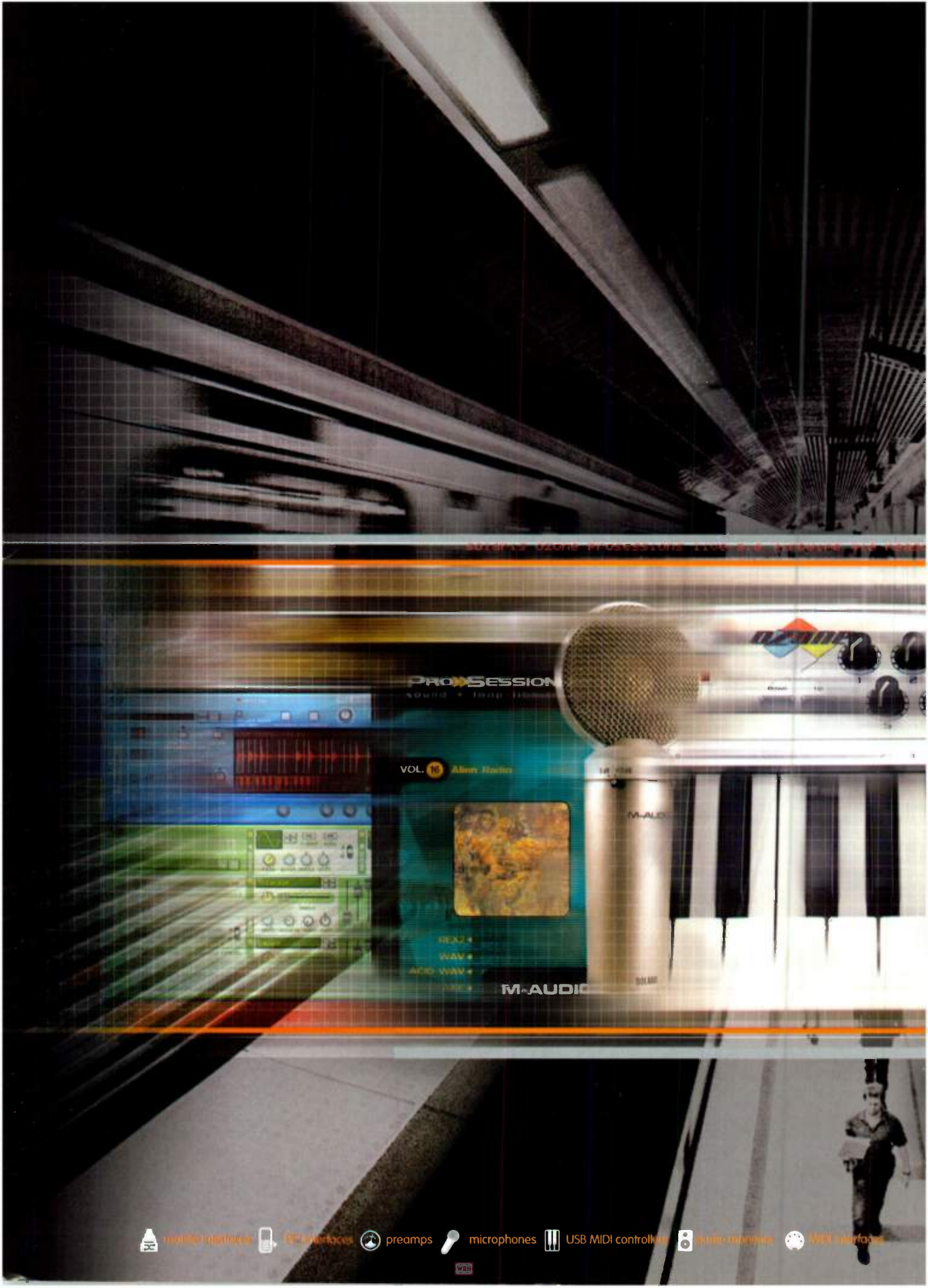
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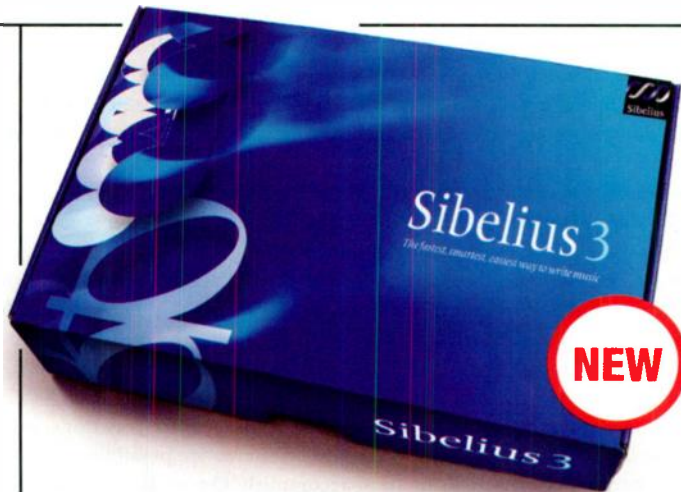
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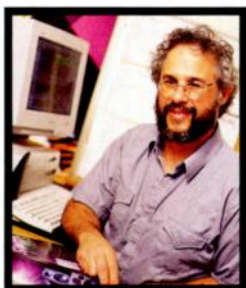
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Editor's Note

BY STEVE OPPENHEIMER



It's no secret that an ever-increasing amount of recording and editing is done using personal computers. We've had effects-processing software for years, of course, but hard drives in today's studios are absolutely jammed with the stuff. And the growth of software samplers and synthesizers is one of the most important studio trends in recent years.

To be sure, hardware effects and electronic instruments still have advantages: they rarely crash, you can rely on a certain minimum amount of available processing power, and some people argue that they still sound

better than software equivalents. Yet the impact of software instruments and effects is so profound that, for example, few companies still develop new hardware samplers. Like it or not, the world of music production is going soft at a rapid pace.

Furthermore, the world of computer products is far more volatile and fluid than that of music-production hardware. Software, audio interfaces, and the like are in constant flux. New operating systems, new computer designs, increased system speed, and the constant march of software development mean that last year's version is already overdue for a major upgrade.

Once upon a time, you could argue that last year's version still did what you bought it to do, so you could live without upgrades. Today, that isn't necessarily so; for instance, if you are a Mac user and your old computer goes to its final rest in the Great Recycling Center, you will probably want to replace it with a new Mac. But the new Power Mac G4s and G5s run only Mac OS X, which will break much of your old music software, and the Power Mac G5 is incompatible with some older PCI cards. So unless you want to buy an older, used machine, with all the inherent dangers, you may be forced to upgrade.

In addition, many of the newest software and peripherals require very fast computers and Windows XP or Mac OS X. These products offer creative possibilities that simply did not exist before or were difficult to accomplish. Once you start learning about them, it's tempting to get on the upgrade path—and in many cases, you probably should yield to that temptation.

To do it right, you need to make informed decisions. That's where *Electronic Musician* magazine and this, our second annual *Computer Music Product Guide*, come in. The charts in this guide will help you keep up with the features, specifications, and system requirements of more than 921 products, as many as we could find. To sweeten the deal, we've included several carefully selected articles from the pages of *Electronic Musician*, which offer handy tips to improve your high-tech studio life. *EM*, of course, is your source for music-technology announcements, product information, reviews, and applications ideas. Between the two, you will be well positioned to make wise purchasing and upgrade decisions.

To top it off, we've provided a special Web "microsite" to support the guide, including downloadable PDF versions of every chart. To go there, follow the CMPG link at www.emusician.com. While you are online, please browse the *EM* Web site and peruse our archives for more articles that will help you reach your musical goals.

I wish you every success in your musical endeavors.

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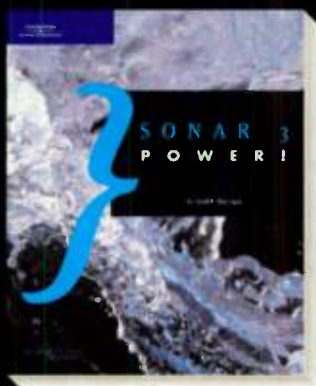
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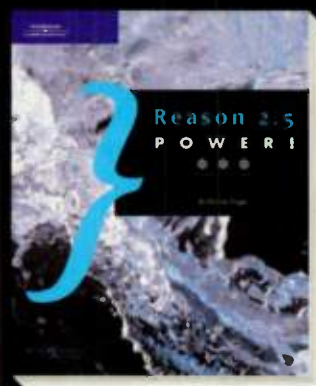
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GROOVIN' EASY, THE LOOP-SLICE WAY.

Closing the Loop

BY TODD SOUVIGNIER

Loop-slicing tools such as Ableton Live, Propellerhead ReCycle, and Sonic Foundry Acid have taken the electronic-music world by storm. By making it possible for musicians to freely mix and match nearly any repeating rhythmic or melodic passage, loop slicers have changed the way many music professionals work.

Offering a simple building-block approach to audio layering, these programs have also made it possible for countless first-timers to get involved with music production.

In this article, I'll take a close look at these three tools and give some loop-slicing pointers that will apply to other programs as well. You'll find helpful information for acquiring, tweaking, and combining loops of all shapes and sizes.

PAST TENSE

Before the release of ReCycle and other loop-slicing software in the mid-1990s, matching loops that had different tempos was tremendously time-consuming. Editing and time-aligning individual drum hits, for example, was a slow, painstaking process, even with the most advanced digital audio workstations.

ReCycle was the first program to address that problem and popularize

the idea of loop slicing. ReCycle uses transient detection to determine where peaks in an audio file are located. The program looks at amplitude envelopes and seeks out the sudden volume changes that indicate the *attack*, or beginning, of a drum hit or other note. It then places flags or markers at the beginning of each attack to indicate where the slices are to be made (see Fig. 1).

ReCycle can export each slice as a separate file for playback from any hardware or software sampler. It can also save the slices as a new continuous file at any tempo for layering within an audio sequencer or other audio software.

Sonic Foundry took the ReCycle metaphor to the multitrack level with Acid. Acid was the first audio software

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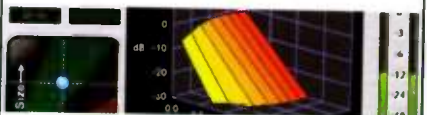
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CLOSING THE LOOP

to offer both slicing and layering within the same program. The mass-market success of Acid allowed Sonic Foundry to go public and spawned a host of imitators. Ableton Live is another contender and is the best of the post-Acid loop-slicing programs. It's also the only one that works on the Mac as well as Windows.

Later in this article I'll focus on techniques that help make the most of ReCycle, Live, and Acid. But first, let's consider some ideas that are applicable to any loop-slicing tool.

FINDING SOURCE MATERIAL

In loop sequencing, the process of selection is a central locus of the art. Selection and juxtaposition are everything—all the rest is just craft.

Possible audio sources include the entire universe of sound and everything that vibrates, though you can divide the options into a few practical categories: provided elements, sound libraries, new original recordings, and appropriated elements.

Provided elements. "Provided" elements exist when doing an authorized remix. In such a case, the artist or label will provide you with audio files or tracks on tape. The remixer decides what portions to use. Some producers

drums or both vocals and instruments are always harder to match and more problematic to mix down than cleanly separated parts.

If, as is often the case, no audio has been provided, look to the other three categories.

Sound libraries. Prerecorded loops, instrument samples, and effects sounds can be bought as part of a sample library. There are two common types of sample library: audio CD and CD-ROM.

Audio-CD sound libraries can be used with any software or sampler, but the tracks will have to be ripped from the CD and saved, typically as WAV or AIFF files. It will probably also be necessary to edit the loops, because most audio-format libraries put several loops within each track.

CD-ROM sound libraries can spare you some editing; files can just be copied to hard disk. CD-ROM sound libraries are available in a number of formats, including proprietary hardware sample formats. Computer-based musicians who don't use hardware samplers will generally want to stick to the WAV or AIFF collections.

Responding to the popularity of loop sequencing, some firms offer presliced libraries. Sonic Foundry has become a preeminent vendor of canned loops,

providing a large line of sound files that are optimized for use in Acid and other programs that support the format (such as Cakewalk Sonar).

Some sound developers have moved to online fulfillment; loops can be previewed, downloaded, and purchased directly from the Web

on an as-needed basis at sites such as Sonomic (www.sonomic.com), PowerFX (www.powerfx.com), and EastWest Sounds Online (www.soundsonline.com).

Before purchasing samples online or buying a library on CD, be certain the audio is in a file format that is compatible with your computer and software,

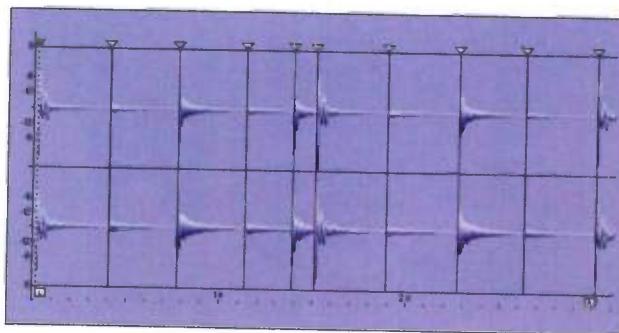


FIG. 1: This sliced loop, as seen in Propellerhead's ReCycle, is an example of the one-note, one-slice rule of thumb.

take an extreme approach, using just the vocals and casting them in an entirely new musical setting.

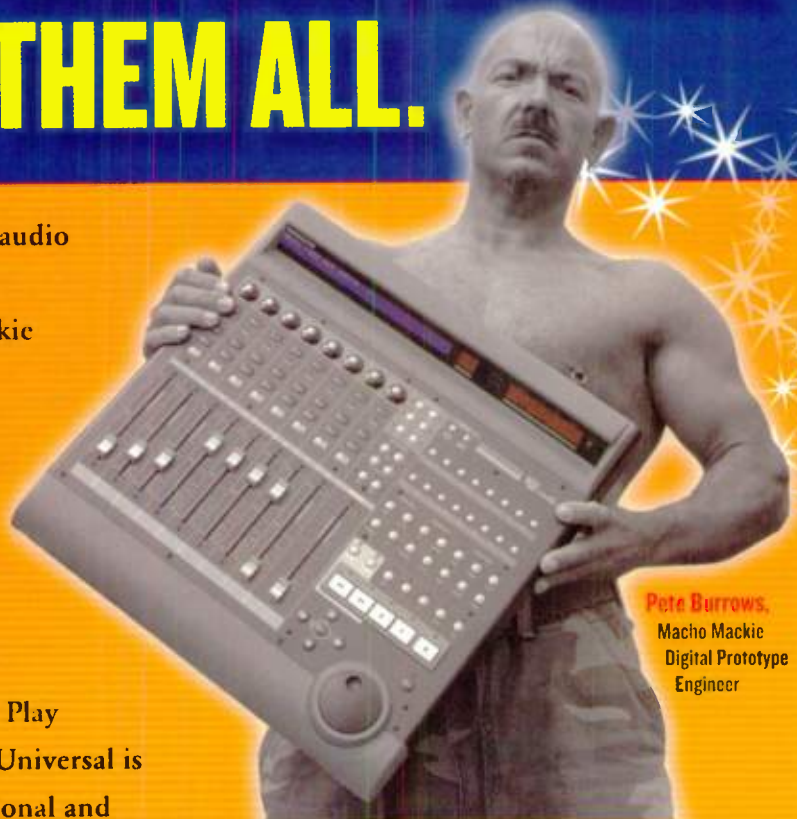
For the greatest ease in layering and the greatest flexibility when mixing down, use isolated instruments and vocals whenever possible. For example, loops that contain both bass and

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and make sure you understand the licensing terms (see the sidebar “Buyout or Per Use?”).

One downside of using such sounds is that hundreds of other producers may have also bought the same sample libraries. If you care about originality, try to do something with the loop to make it your own. Possible tactics include using signal processing, chopping and rearranging the loop, and replacing sounds with new instruments.

New original recordings. A loop recording session with a live drummer or rhythm section can be wildly fun and rewarding. It’s the best way to get all-original loops that are exclusively your own.

Here are some simple rules to ensure optimal results:

Have the drummer play to a click track or metronome so timing is steady.

Do not apply any signal processing (such as delay or reverb). Tracking “dry” gives you more choices later.

If you are recording a rhythm section or full band, put each instrument on a separate track. Once you combine them, it’s very difficult to “unmix” them.

Try to put each drum on a separate track when recording drum kits.

Slate your loops. Have the engineer or drummer speak into a mic at the beginning of each take. Be sure that the tempo in the slate is mentioned; for example, “This is rock pattern number 1, 100 bpm, take 2.”

Jot notes on paper about every take, including the tempo, the start and end times, and any other words of description. Paper notes and audible slates make it easier to locate and edit loops after the session.

Leave time at the end of the recording session for transfers. *Transferring* means converting the audio from one

recording medium to another; for example, from 2-inch analog tape to files on hard disk or CD.

Be sure that the transfer is in a format that can be used easily with your setup. Most studios today have CD burners; I always ask for an ISO 9660 (PC-format) CD-ROM of WAV or AIFF files. Such a disc will be compatible with Windows and Macintosh computers.

Appropriated elements. The word *sample* has come to be synonymous with the reuse of excerpts from other recordings. Appropriating elements from previous works and recasting them in a new work is a timeless artistic and literary strategy, practiced by luminaries such as William Shakespeare, Andy Warhol, and others. That legacy has nothing to do with the music business, which is a highly competitive and litigious arena.

The growing popularity of sampling gave rise to a new music-industry endeavor called sample clearance. To obtain sample clearance means to secure permission to reuse an excerpt of a recording. Although any kind of deal is possible, licensing samples can be expensive. I’ve heard of extreme cases in which sample owners insisted on taking majority ownership of a new composition.

Nonetheless, if a recording is to be released commercially, the samples should be cleared first. Settling a sample clearance after a song has become a hit can be far more problematic and expensive than getting permission in advance.

LOOP-EDITING TIPS

Once you have selected audio source material, you will need to edit the sound files into usable loops. That is best done using professional sound-editing software such as BIAS Peak (Mac)

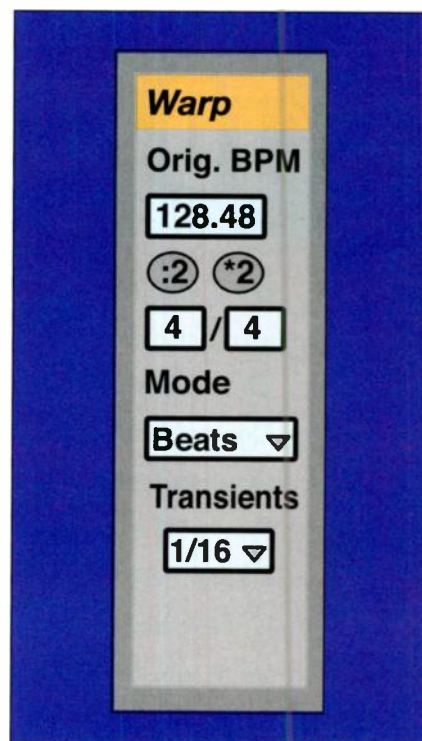


FIG. 3: In Ableton Live, click on the Transients pull-down menu from the Warp dialog to adjust the default slice grid value. (This menu was labeled Transient Res in Live 1.x.)

or Sonic Foundry Sound Forge (Win).

Loop files that are edited correctly can be imported or previewed instantly by Acid and Live, which helps speed things along when selecting audio in those programs. Here are some things to bear in mind when editing loops:

- Cut on the “1,” at the beginning of the first beat in the measure or bar. I always try to cut immediately before the first cycle of the attack (see Fig. 2).
- Don’t cut into the transient! Edit immediately before the attack begins, or else you’ll lose some of the instrument’s character.
- Listen to the loop. Most audio-editing programs have a “loop play” or “audition” feature that plays any selection repeatedly.
- If the loop sounds anything less than slamming, check the start and end points.

If the above four tips don’t help, and things still sound weak or disjointed, try a different loop. Bands and drummers often make timing errors, so not every recording is loopable.

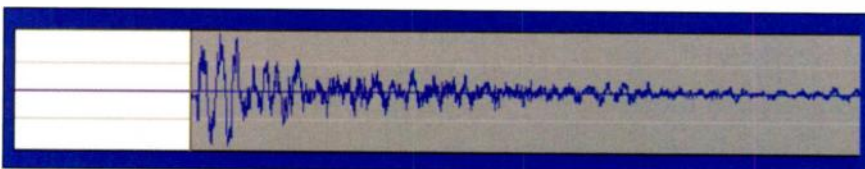


FIG. 2: A good edit typically begins immediately before (to the left of) the note’s attack portion. The selection area is highlighted in gray.

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- Loop start and end points should always fall on *zero crossings*. Zero crossings are points at which the waveform is at 0 dB, represented as the line in the middle of a waveform display.

- As an extra precaution, meticulous producers such as Mark Pistel (Consolidated, Meat Beat Manifesto) always perform a tiny fade-in at the beginning of a loop and a tiny fade-out at the end to force the waveform to zero. That is done while zoomed way in; the fade can occur over a single wave cycle.

- Make note of the loop's tempo and the number of measures in the loop file name when saving or renaming the file. I like names such as "rockbeat 1 – 110bpm – 4x.WAV" and "reggaepattern2_90bpm_2meas.AIFF." Loop sequencers will frequently miscalculate the tempo and length of a file if the file is more than one measure long. Having the vital statistics front and center in the file name can save time and prevent confusion when layering loops.

SLICED AUDIO FORMATS

Sonic Foundry's Acidized audio file format and Propellerhead's REX and REX2 formats combine loop audio with the loop tempo and slice-point coordinates. Acid and ReCycle can save loops in these proprietary formats, and you'll find a sizable selection of such loops in sound libraries ready to use.

However, the pressing need for pre-sliced audio libraries has diminished as loop sequencers have evolved. Any WAV file can be imported into Acid and, if correctly edited, will be sliced

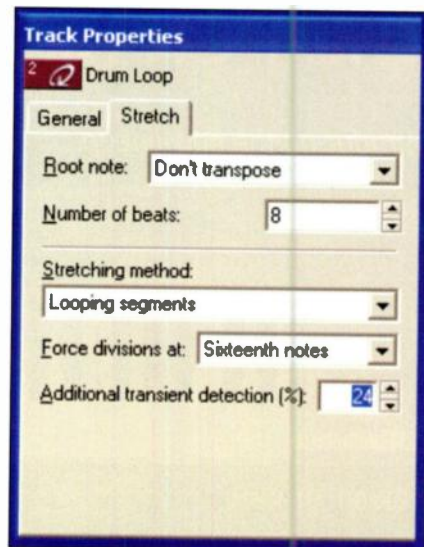


FIG. 4: Sonic Foundry's Acid uses a combination of grid-value and transient-detection methods. You can change the default detection sensitivity by using the Additional Transient Detection field (highlighted).

and time-aligned instantly. Acid can also autopreview loops and play them from the Explorer display at a project's tempo prior to importing. Live's comparable feature, Pre-Listening, plays WAV and AIFF files from the Browser panel also in time with the current session.

To recap, both Acid and Live can use practically any loop without special conversion into a proprietary format. And you don't have to export or save loops in a sliced format if you're only using the loops in a single composition.

The benefit of having preformatted loops comes into play when using a



FIG. 5: Ableton Live's Warp markers appear as yellow or gold flags in version 2; they were colored green in the 1.x versions.

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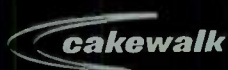
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nonslicing sequencer or software sampler. Emagic's Logic, Steinberg's Cubase VST and Cubase SX, MOTU's Digital Performer, and Propellerhead's Reason support the ReCycle REX2 format, as do the Steinberg HALion and Emagic EXS-24 software samplers. These programs will import any file that has been sliced in ReCycle and will handle the slices as a single track or file, allowing free adjustment of the tempo.

ON THE GRID

Your loop-slicing goal should be to have one note per slice. Slices containing two or more notes (or drum hits) will not time-align correctly, and notes that have been broken into two or more slices won't sound right.

The grid-slicing features of Live and Acid set slice points at predetermined intervals by applying a note-value grid. That is in contrast to the transient-detection method used by ReCycle, discussed later in this article.

In the lower part of the Live display is the Clip view, in which you'll find the Warp settings. One of the Warp settings is a confusingly labeled pull-down menu called Transients (see Fig. 3). That menu is used to set the Transient Resolution (or "Transient Res" in Live 1.x), which applies a grid to the loop. A 1/16 Transient value slices the loop at every 16th note. That default value works fair-

ly well with many typical pop, rock, and dance drum tracks.

The Acid grid setting, named Force Divisions At, is found in the Track Properties display inside the Stretch tab. Force Divisions At also defaults to a 16th-note grid value; it's a fine starting point and can be adjusted using the pull-down menu.

Sixteenth notes may be too small a grid for pitched-instrument loops. Notes held longer than a 16th note will get split up, which can cause audible noise. If slicing makes a loop sound distorted or grainy, try increasing the grid value to eighth or quarter notes.

Conversely, 16th-note grids might be too big for busy loops. If time-shifting causes tempo variances within a loop, try a 32nd-note grid value.

In summary, the default 16th-note grid usually works well for dance-genre drum tracks. Finer grids such as 32nd notes may work better on frenzied percussion parts; larger grids are often needed for pitched melodic parts. Be sure to check the waveform display, and listen carefully when slicing and time-shifting.

TOO SENSITIVE

As mentioned earlier, transients are sudden increases in the volume of a waveform that normally happen dur-

ing the attack or beginning of a drum hit or note. Transient-detection algorithms analyze the waveform and try to find any sudden digressions that might signal an attack.

Drum hits usually have pronounced transients caused by the drumstick displacing the drumhead or cymbal. As a result, accurate transient detection is quite feasible with drum loops. Sustained-pitched musical phrases such as bass, keyboard, or guitar parts can be more difficult to transient detect; legato passages might have few or no detectable transients.

Transient-detection sensitivity can be adjusted in some products. Sensitivity is a "threshold" value—only those volume changes that exceed specified decibel or displacement levels will be flagged as transients.

Sensitivity is a major feature in ReCycle and is easy to use. Click-and-drag on the Sensitivity slider, and slice markers will appear (or disappear) in the waveform overview.

To find the sensitivity setting in Acid, double-click on any clip to open the Track Properties display. Then click on the Stretch tab, in which you'll find the Additional Transient Detection numeric-value field (see Fig. 4). Acid uses a default value of 10 percent sensitivity, but the setting is user-adjustable from 0 to 100 percent.

Because all loops are different, there is no magic setting that will work in every instance. Again, the goal is to have one note per slice and one slice per note. Watch the waveform overview as you boost or cut sensitivity, and you'll be able to get to the optimal number of slices quickly.

SLICES YOUR WAY

As good as these software products are, they still can't do all the work for you. After adjusting grid and sensitivity values, you may still have to add or remove some slices by hand to obtain the one-note, one-slice goal.

In ReCycle, simply click on the Pencil button, which activates the Pen tool. Clicking the Pen tool in the waveform

Buyout or Per Use?

Sound libraries are marketed under two different licensing models: buyout and per use.

Per-use or "needle-drop" sound libraries require payment of a license fee or "royalty" for each use of a recording. Each subsequent usage increases the cost of a per-use library. Depending on the library and usage, this fee may be cheap or expensive. Better-organized per-use libraries include forms for notifying the licensor and remitting the appropriate fees.

Buyout sound libraries take the opposite approach and have be-

come the more common model. A one-time up-front license fee is included in the purchase price of the library. Sounds purchased can then be used in practically any production, with no additional fees or paperwork. Some sound developers use the phrase "royalty free" when advertising their samples. "Royalty free" is just marketing-speak for "buyout."

Buyout libraries may be more costly to acquire initially than per-use libraries. But over the course of time and usage, a buyout library may actually be less expensive and more convenient.

continued on page 36

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FW-1884	18-in / 18-out	8 XLR mic, 8 1/4" TRS (bal.)	YES	8 1/4" TRS (bal.) + headphone	8 1/4" TRS (bal.)	two S/PDIF	24 bit/ 96 khz	64 ch.	GigaStudio	9 motorized, touch-sensitive faders ^{2,3} , Aux, Pan, Phones, Line, Jog, Transport, DAW shortcuts and much, much more	ASIO, WDM, GSIF, Core Audio, MME, Sound Manager ^{3,4}
US-428	4-in / 2-out	2 XLR mic, 2 1/4" TRS (bal.), 2 1/4" (unbal.)	YES	2 RCA (unbal.) + headphone	N/A	two S/PDIF	24 bit	32 ch.	GigaStudio & Cubasis VST	8 faders ² + stereo master, Aux, Pan, Phones, Line, Jog, Transport, DAW	ASIO, WDM, GSIF, Core Audio, MME, Sound Manager ⁴
US-224	2-in / 2-out	2 XLR mic, 2 1/4" TRS (bal./unbal.)	YUP	2 RCA (unbal.) + headphone	N/A	two S/PDIF	24 bit	16 ch.	GigaStudio & Cubasis VST	4 faders ² + stereo master, Phones, Line, Jog and Transport	ASIO, WDM, GSIF, Core Audio, MME, Sound Manager
US-122	2-in / 2-out	2 XLR mic, 1/4" TRS (bal./unbal.)	YEAH	2 RCA (unbal.) + headphone	two inserts	N/A	24 bit	16 ch.	GigaStudio & Cubasis VST	2 rotary input level controls, Line, Phones, Direct Monitor	

¹ switchable phantom power ² unlimited via bank switching

³ expandable in banks of 8 channels with FE-8 "sidecar"

⁴ via applicable DAW software

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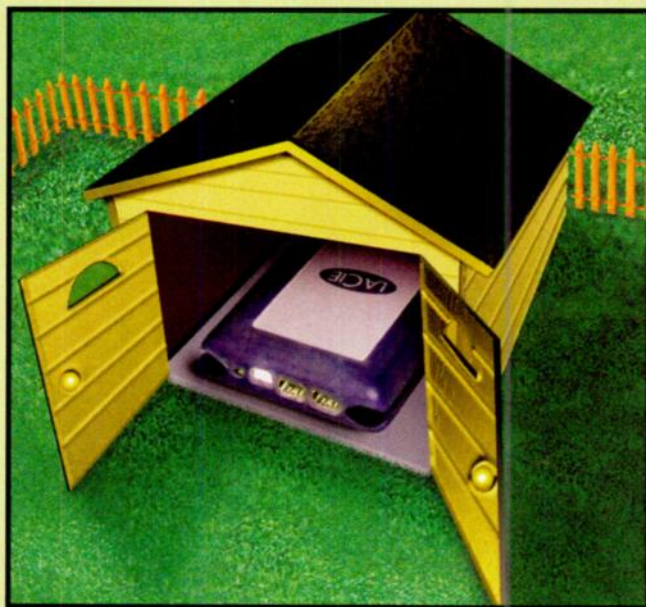


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Outside Storage

BY BRIAN SMITHERS

It wasn't so long ago that I was considered a freak for making a notebook computer the center of my studio. Compared to the awe-inspiring Pentium 60 desktops of the day, notebooks were slow and limited. Audio hardware for laptops came in two types: vaporware and buyer-beware. Worst of all, recording to a 400 MB

hard drive gave new meaning to the term *cramped quarters*.

Now that using notebooks for audio production is commonplace, all those problems have been resolved, right? Not exactly. There are indeed a number of appealing audio interfaces on the market, and notebook processors have advanced to the point of being more than adequate for almost any audio task. Storage, however, is a different issue.

With very few exceptions, notebooks are equipped with only one hard drive. That simple fact is bad news for laptop audio engineers for three rea-

sons. First, using a dedicated audio drive that is separate from the system drive is a simple and cost-effective way to get more tracks out of your computer. That's because the drive reading and writing audio data is unimpeded by requests to deliver OS or program files. Second, a single drive gets cluttered and cramped too quickly, especially when a typical 20 GB notebook drive shares its space with the operating system, programs, libraries of samples and loops, and so forth. The third reason has to do with drive speed: most laptop drives spin at a measly 4,200 rpm, barely more than

half the speed of a typical 7,200 rpm desktop drive. (For reliable audio performance, 7,200 rpm is the minimum acceptable speed.)

LIGHT MY FIRE

As you can see, it's best to have a dedicated audio drive for your notebook—one that's big enough and fast enough to hold your dream sessions. Because there's no room inside your notebook to install such a drive, your only option is to connect an external drive. There are a few different ways to accomplish that, but let's start with the one that's capturing all the attention of late: FireWire.

Properly known as IEEE 1394, FireWire combines a data pathway capable of moving 50 MB per second (400 Mbps) with Plug-and-Play connectivity and hot-swappability. Theoretically, you can daisy-chain a large number of devices on a single FireWire port, but because they all

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share the same bandwidth, there's a practical limit to how many devices you would want to chain.

For a notebook equipped with at least one IEEE 1394 port, attaching an external FireWire drive (see Fig. 1) and hitting the Record button is about all there is to it. Most current FireWire drives use 7,200 rpm IDE drives, offering plenty of speed at a reasonable price.

One thing to watch out for is that not all IEEE 1394 connections are created equal. It's less of an issue with more recent devices, but early implementations of the protocol often operated at less than the full bandwidth. For example, according to Jim Cooper of MOTU, "Older iMacs and Blue G3s were equipped with 200 Mbps [FireWire] buses, as are several PCI and CardBus [FireWire interfaces]. Buyers should always check to make sure that any FireWire expansion products they are thinking about purchasing offer 400 Mbps bandwidth."

MOTU's 896 FireWire audio interfaces feature pass-through ports that allow users to chain multiple interfaces and FireWire hard drives, and MOTU's 828s can be chained to drives that have a pass-through port (or you can use a

powered hub). "Our experience is that one FireWire hard drive, in terms of bandwidth, equals one 828. So you could have three 828s and one FireWire drive, for example," according to Cooper. When using the 896's higher sampling rates, of course, track count is cut by about half.

Gordon Lyon, Digidesign's Product Manager for Storage and Compatibility, states that good indicators of a FireWire drive's suitability for audio include 7,200 rpm rotation speed, 100 MHz ATA bus, and the Oxford 911 chip. Not surprisingly, one drive matching that description is Digidesign's own DigiDrive FireWire 80, which is capable of being daisy-chained to a Digi 002 FireWire interface without compromising performance. Oxford Semiconductor's 911 chip seems to be a common denominator for many of the FireWire drives being sold for DAW use. (The truly power-mad will no doubt be excited to know that Oxford has announced the 922 chip, supporting the next generation of double-speed FireWire devices.)

Operating-system support for FireWire drives is respectable on both Macs and PCs, but the vendors with whom I spoke generally recommended using the latest versions of the operating systems. As always, it's a good idea to check your DAW manufacturer's online tech notes or compatibility documents before parting with your hard-earned cash. Notebooks with 4-pin FireWire connections will need an adapter cable to connect to a drive, which uses a 6-pin connection.

How fast is fast? The bottom line, of course, is how many tracks you can expect to record and play back with a FireWire hard drive. As with most computer-performance questions, the answer is, "It depends." There are so many variables involved that hard numbers are hard to come by. Processor speed, driver design, choice of software, bit depth, sampling rate, background applications, and other factors all have to be taken into account.



FIG. 2: WiebeTech makes the utilitarian DriveDock line of FireWire adapters, allowing you to hook up off-the-shelf bare drives to an IEEE 1394 connection.

The good news is that the numbers I've heard are all pretty encouraging. I've heard numerous reports from users of getting 64 or more tracks of 24-bit, 44.1 kHz audio playback from a single FireWire drive attached to a reasonably powerful notebook computer. The most conservative numbers come from Digidesign, whose systems support up to 24 tracks of 24-bit, 48 kHz audio per FireWire drive.

Glyph Technologies conservatively rates its 80 GB Companion FireWire drive for 48 tracks of playback with no edits or 48 tracks of recording at 24-bit, 48 kHz resolution. At 96 kHz, those numbers drop to 40 tracks, but with two edits per second across all tracks the numbers drop by about half. That's not unique to FireWire drives, but because they spin at 7,200 rpm they are more sensitive to edit density than are the 10,000 rpm drives typically used in SCSI configurations. (According to Glyph, these results are based on Digidesign's own torture test, which stresses the drives far beyond typical recording, mixing, and editing use.)

The most optimistic numbers I've seen claim 120 tracks of 24-bit, 44.1 kHz audio with an edit density of two edits per second. At a 192 kHz sampling rate, the highest numbers are 24 tracks for a single drive. For the most



FIG. 1: Glyph Technologies' line of FireWire drives includes the extraquiet Companion drive, which is designed to match Digidesign's Mbox audio interface.

up-to-date information, be sure to check the vendors' Web sites. As they say, your mileage may vary.



FIG. 3: Trek's ThumbDrive is one of the many solid-state USB storage devices to hit the market recently. Though its speed isn't up to the needs of multitrack audio recording, its convenience for storing samples and song ideas is undeniable.

While most FireWire drive vendors are touting their well-insulated noise-suppressed external drives, a company called WiebeTech is taking the opposite approach with its DriveDock line of FireWire bridge modules (see Fig. 2). The DriveDock attaches on one side to an IEEE 1394 cable and on the other side to a naked 3.5-inch hard drive (or CD or DVD drive). What this setup lacks in sex appeal and noise proofing it makes up for in convenience, price, and flexibility. You could literally have a single DriveDock and a bag full of hard drives and swap out the drives from project to project. The DriveDock requires an AC adapter, but its sibling the Super DriveDock is bus powered.

EXPRESS BUS

USB 1.1 drives have quite appropriately been dismissed as inadequate for digital-audio recording. With a maximum data rate of 12 Mbps (compared with IEEE 1394's 400 Mbps), USB could under ideal circumstances deliver a few tracks of 24-bit, 44.1 recording or playback. Most modern notebooks would do much better using their internal drives.

USB 2.0 increases the stakes to 480 Mbps (maximum burst rate), surpassing (in theory) the performance of current FireWire devices. (USB was not designed to handle large blocks of streaming data, such as digital audio, as efficiently as FireWire does, so it demands more processing overhead for any given audio command.) While some manufacturers are taking a wait-and-see attitude, Cakewalk's Vice President of Engineering Ron Kuper says, "I think USB 2.0 has a strong future

continued on page 30

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Stealth MP3s

BY DAVID BATTINO

Few people realize that WAV files, perhaps the most universal sound-file format, are actually containers that can hold many different types of data. Using a free, 44 KB program by Peter Luijter called WaveMP3, I've been converting standard MP3s into files that look and play back like WAVs but retain the tiny size of the originals.

These MP3-encoded WAVs are especially useful on the Web, because unlike other compressed audio files (including straight MP3s), they play back without helper applications or esoteric plug-ins.

Disguising your MP3s as WAVs also enables you to use them in some programs that don't officially support the MP3 format, such as older versions of Microsoft Office and some underground video encoders. In this article, I'll explain how MP3-encoded WAVs work, how to create them, and how to use them to pump up your site.

ONE WAV OR ANOTHER

Along with AIFF and AU, WAV is one of the few sound-file formats that almost all Web browsers support "right out of the box." However, AU is an obsolete, compressed format that sounds rather nasty, and AIFF plays back unpredictably on certain browsers. Further, AIFF technically doesn't support data compression, which is why the AIFC format was developed. According to two Mac audio programmers that I contacted, Tom Erbe (SoundHack) and Norman Franke (SoundApp), it should be possible to embed an MP3 in an

AIFC file, but neither has come across such a beast. WAVs, on the other hand, are everywhere. For short sound effects, such as an "audio logo" that announces your home page, they're often ideal. (See the sidebar "Embedding Manual" for the HTML code to create such background sounds.)

The drawback to using standard WAV files, however, is their gargantuan size. A 2-second stereo WAV file at 16-bit, 44.1 kHz resolution gobbles up 341 KB, which could easily take 50 seconds to download on a standard 56 kbps modem. You can cut that by 75 percent by collapsing the file to mono and downsampling it to 22.05 kHz; because most of your visitors will have wimpy multimedia speakers, they won't hear much difference. Still, 12.5 seconds is a long time to wait on the Web, and that doesn't count the download times for any graphics or text on the page. With sounds that

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don't have much high-frequency content or dynamic range, you can lop off another 75 percent by pummeling the files down to 8-bit, 11.025 kHz mono, but the resulting trashy quality is more appropriate for comedy vocal effects than elegant logos. It's better to shorten the sound. A 1-second, 16-bit, 22 kHz, mono WAV file should download in about six seconds, which is reasonable.

But for a site I recently designed to promote a friend's new shakuhachi CD (see Fig. 1), I wanted to introduce the page with longer musical excerpts; a brief blip wouldn't be enough to set the meditative mood. And I didn't want to monkey with formats like Flash, RealAudio, QuickTime, WMA, or straight MP3s that might require the visitor to install a plug-in or a helper application.

That's when I discovered MP3-encoded WAVs. Using Steinberg WaveLab, I extracted multibar phrases from the CD, mixed them to mono, and en-

coded them as 64 kbps MP3s, which I then camouflaged with WaveMP3.

Due to the way MP3 compression works, a 64 kbps mono file has about the same audio quality as a standard 128 kbps stereo file. That's because kbps is a measure of the data rate, not the audio frequencies. Reproducing an extra stereo channel requires more data, so the encoder must reduce the sound quality to maintain the rate.

You lose some sense of spaciousness by converting to mono, of course, but in this case the duration was more important. As an example, I reduced a 6.7-second, 585 KB mono WAV file to a 52 KB, MP3-encoded WAV with negligible reduction in sound quality—at least for this Web application. That's more than a 20:1 compression ratio over the original stereo file.

DO YOU KNOW THE WAV?

Most types of audio files—including WAV, AIFF, and MP3—contain raw samples of the original analog waveform

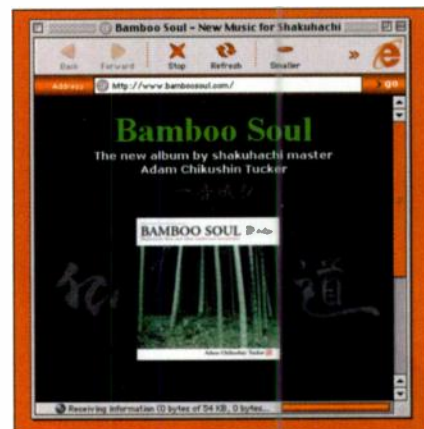


FIG. 1: At BambooSoul.com, a custom JavaScript triggers random musical excerpts every time the home page loads. Because the music is in MP3-encoded WAV format, it downloads quickly and transparently.

and additional descriptive data about those samples, usually stored in the *file header*. Without that so-called *metadata*, the playback device or program would have no clue which sampling rate, resolution, or number of channels to use. (In the case of compressed formats like MP3, the player also needs to know

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TECHNICAL INFORMATION

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which decompression algorithm to use.) An audio file without metadata is called a *raw* file. (For more on sound-file anatomy, see "Square One: Making Waves" in the April 2002 issue of EM.)

Rather than use a single header, WAV files store data in *chunks*. Typically, the Data chunk contains uncompressed, pulse-code-modulation (PCM) audio samples. But if the preceding Format chunk specifies a different format, other types of audio data—such as MP3—can be stored instead. WAV files also contain a List/Info chunk, which can hold textual information about the

file, just as ID3 tags can be used to store artist and song names (and even simple graphics) in an MP3 file.

Converting MP3s into MP3-encoded WAVs with WaveMP3 is easy. Just drag an MP3 file onto the program's icon, and WaveMP3 adds the correct chunks and creates a new WAV file. If the program finds an ID3v1 tag at the end of the MP3, it creates a List chunk and fills in the corresponding data fields, which can then be displayed in newer versions of Windows Media Player.

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Embedding Manual

Fig. A shows the technique I used to play a random sound every time a visitor loads the BambooSoul.com home page. The code is based on a JavaScript by Peter Gehrig and Urs Dudli of 24fun.com, a bonanza of offbeat JavaScripts. The randomizing technique shown here can also be used to display movies, links, images, text, or other objects.

To use this script, place the `<SCRIPT>` section anywhere between the `<BODY>` tags on your page, depending on how much of the other content (images and text) you want your visitors to see before the sound starts loading. Loading may take several seconds for sound files that are larger than 50 KB, so it's best to insert the script toward the end of the body section so that your visitors aren't stuck staring at a blank screen. Remember that large sound files may take so long to load that

you can lose the effect of synchronicity.

Here's how the script works: the "var Waves" line sets up an array called Waves that contains MP3-encoded WAV files. I used five files here, but you can use any number. The next line picks a random integer between 0 and the number of items in the array and assigns it to the variable WaveNumber. Because items in a JavaScript array are numbered from 0, that step enables the script to call up a specific sound by number. (For example, Waves[2] would be the third item in the array.) The subsequent "document.write" lines embed the designated WAV file in the page.

Note that the `<EMBED>` tag contains width and height attributes of 2, even though the playback controller is hidden. That was done to prevent problems with QuickTime. The `<NOEMBED>` section, which contains the `<BGSOUND>` tag, is included for older versions of Microsoft Internet Explorer that can't handle the `<EMBED>` tag.

Think hard before adding sounds to your site. They can clash with music that visitors are already listening to or, when triggered in an office environment, disturb coworkers or clue a boss that an employee is goofing off. A bad sound is worse than no sound. When it is done tastefully, however, Web audio can make a world of difference.



FIG. A: HTML sample for creating random sound.

Algorithmic Composition Software

Manufacturer	Product	Version	Minimum System Requirements	Standalone or Plug-in	Architecture	Number of Modules	Supports User-created Modules	Audio Support	Polyphony	Random or Deterministic	Reads Bitmaps	Special Features	List Price
Cycling '74	M	2.5.8	Mac OS, 32 MB RAM	Standalone	Predefined	24	No	No	128	Random	No		\$
Karma Lab	KARMA MW (for Korg Karma)	1.2	Win 98/ME/NT/2000/XP, PIII, Mac OS9/X, G3, 64 MB RAM, MIDI	Standalone	Predefined	N/A	No	No	N/A	Random	No	Generates phrases, grooves, effects. Editor/Expander for the KARMA algorithmic function	\$149
Karma Lab	KARMA Triton (for Korg Triton)	1.2	Win 98/ME/NT/2000/XP, PIII, Mac OS9/X, G3, 64 MB RAM, MIDI	Standalone	Predefined	N/A	No	No	N/A	Random	No	Generates phrases, grooves, effects. Includes 768 progs/combs, 1192 GEs from Korg Karma	\$199
Pirkle & Associates, Inc	Pirkle's Music Composition Studio	4.1.2	Windows 95, 98, NT, XP, 8 MB RAM	Standalone	Predefined	N/A	No	Yes	32	Deterministic	No	Generates classical (symphony, concerto, piano), jazz, blues, reggae. User involvement optional	\$99
SoundTrek	JAMMER Live	1.0	Windows 95, 98	Standalone	Predefined	N/A	No	No	N/A	Random	No	Real-time interactive back-up band software	\$60
SoundTrek	JAMMER Professional	5.0	Windows 95, 98, ME, 2000, XP	Standalone	Predefined	N/A	No	No	N/A	Random	No	Song-creation software	\$129

Computer Music Systems

Manufacturer	Product	CPU Range Offered	Case Types	Tech Support Period	Tech Support Type	Warranty (years)	Special Features	List Price
Allfront Technologies	Open Sound System	Pentium/Sparc/PowerPC/PA RISC	Desktop/rackmount	1 year	Phone, email	2 years	Digital audio for UNIX operating systems	\$20-\$75
Carillon Audio Systems	Carillon AC-1	Pentium 4 2.0 to 3.0 GHz	Rackmount	Unlimited	Phone, email	3 years	5,000 included audio samples, remote tech support, HTML how-to manuals on desk	\$1,199 and up
Digital Audio Labs	CardDeluxe	386 - any	N/A	Unlimited	Phone, email	1 year	Win 95 - XP	\$399
Digital Audio Labs	PD-8, 8 Channel AES/EBU IF	Pentium II 300 or faster	N/A	Unlimited	phone, email	1 year	multicard support, ultra word clock, stereo analog out, Win 9x - XP	\$799
Digital Audio Labs	TDIF 2496 Pro	Pentium II 300 or faster	N/A	Unlimited	phone, email	1 year	Dual TDIF, DTRS sync port, multicard support	\$699
Hercules	Hercules 16/12 FW	Pentium II and up	Rackmount	Unlimited	Phone, email	1 year	24/96 - 16 In/12 Out, DV/FireWire card included	\$899
MultipointUSA	Super Xeon Workstation	Xeon 3.0 GHz/1 MB/533 MHz FSB	Rackmount, standard, portable	3 years	Phone, e-mail	3-5 years	Continuous duty, quiet, real-time editing onsite	\$4,599 and up
SM PRO Audio	IN5 Multi I/O	Pentium II and up	Rackmount	Unlimited	Phone, email	1 year	Dual-box mixer, format converter, recording interface	\$399
SM PRO Audio	PR8 MKII	Pentium II and up	Rackmount	Unlimited	Phone, email	1 year	8 ch. mic preamp - inserts and phantom power and phase reverse on all ch. - with ADAT option	\$399
ST Audio	SRC VI	Pentium II and up	Rackmount	Unlimited	Phone, email	1 year	Digital patchbay/switchbox for up to 6 AES/EBU and S/PDIF signal streams	\$299
ST Audio	DSP2000 C Port	Pentium II and up	Rackmount	Unlimited	Phone, email	1 year	2x balanced (XLR) inputs with built in preamps and switchable phantom power	\$699
ST Audio	DSP3000 M Port	Pentium II and up	Rackmount	1 year	Phone, email	1 year	Level meter display for each input channel (switchable to display output signal)	\$1,195
ST Audio	DSP24 ADAT	Pentium II and up	PCI card	Unlimited	Phone, email	1 year	10x10 24-bit 100% Full-Duplex recording path support	\$299
ST Audio	DSP24 Media 7.1	Pentium II and up	Rackmount	Unlimited	Phone, email	1 year	Onboard hardware synthesizer (Dream/Roland GS soundset)	\$499
ST Audio	ADAM 24	Pentium II and up	Rackmount	Unlimited	Phone, email	1 year	8 analog mono inputs unbalanced, 8 analog mono outputs unbalanced	\$449
Symbolic Sound Corporation	Kyma X	Mac OS9, OSX, Win ME, 2000, XP	Racktop, desktop	Unlimited	Phone, email, forum	1 year	Open-ended software for realtime sound design with hardware accelerator	\$3,570
Wave Digital Sytems	StudioG4, StudioPowerBook	G4 up, 1.2 GHz	Desktop, tower, rackmount	Unlimited	Phone, email	1 year	Preconfigured Macs for Pro Tools, Digital Performer, Nuendo, Logic Audio	\$1,399

Audio Editors

Manufacturer	Product Name	Minimum System Requirements	Number of Audio Tracks	Record Resolution (word length in bits)	Sampling Rates (kHz)	Audio File Formats Supported	Plug-in Formats Supported
Adobe	Audition	Win 98SE, ME, 2000, XP 400 MHz, 64MB	128	32-bit	192+ kHz	WAV, AIFF, MP3PRO, WMA, CEL, AU, VOX, PCM	DirectX
BIAS Inc.	Peak 4	Mac OS 10.2, 256 MB RAM	2	32-bit	10,000 kHz	AIFF, SDII, WAV, MP3, MPEG-4, .SND, .AU, JAM image, SONIC AIFF, PARIS (.PAF)	VST, AU
Blaze Audio	RipEditBurn 2.0	Win 9x, ME, 2000, XP	2	24-bit	Unlimited	WAV, MP3, RA, WMA	BAE
Celemony Software GmbH	Melodyne cre8 2.0	Mac OS 9, Mac OS X, Win 98, ME, 2000, XP, 256 MB RAM	8	24-bit	48 kHz	WAV, AIFF, SDII, SND	VST, AU
Celemony Software GmbH	Melodyne Studio Edition 2.0	Mac OS 9, Mac OS X, Win 98, ME, 2000, XP, 256 MB RAM	32	32-bit	192 kHz	WAV, AIFF, SDII, SND	VST, AU
Emersys	Maven3D Professional	Win 98SE, 500 MHz CPU, 128 MB RAM	64	24-bit	96 kHz	WAV, AIFF, WMA, MP3, AC3, AAC, PCM, DAT, CDA, AVI, ASF, MPG, MPEG, MOV, WMV	VST, DirectX, DMO
Emersys	MavenXP	Win 98, 166 MHz CPU, 128 MB RAM	8	16-bit	48 kHz	WAV, MP3	DMO
Emersys	Maven3D	Win 98, 500 MHz CPU, 128 MB RAM	16	16-bit	48 kHz	WAV, MP3	DMO
FASoft	n-Track Studio 3.3	Win 95, 98, ME, NT, 2000, XP	Unlimited	24-bit	192 kHz	WAV, MP3, WMA, OGG	DirectX, VST, DirectXi, VSTi
GenieSys Voice L.C.	SampleRat 1.0	Intel Celeron 400, Win 98 SR, 32 MB RAM	2	32-bit	96 kHz	WAV	N/A
Magix Entertainment Corporation	Magix Music Studio 2004 DeLuxe	Win 98/98SE/ME/NT/2000/XP, 400 MHz, 64 MB RAM, 100 MB free	64	16-bit	up to 48 kHz	WAV, WMA, REAL, AIFF, MP3, MID, SF2, EXS, MPEG	DirectX, VST 2.0
Magix Entertainment Corporation	Magix Music Maker 2004 Deluxe	Win 98/98SE/ME/NT/2000/XP, 400 MHz, 64 MB RAM, 250 MB free	96	16-bit	up to 48 kHz	WAV, WMA, REAL, MP3 (w/optional encoder)	DirectX, VST
Magix Entertainment Corporation	Samplitude 7.0	Win 98SE/2000/ME/XP	Unlimited	32-bit float	up to 96 kHz	WAV, AIFF, MP3	DirectX, VST
Next Generation Software, Inc.	NGWave 2.0	Win 98/ME/2000/XP, PIII or greater, 128 MB RAM	2	24-bit	192 kHz	WAV, MP3	N/A
Propellerhead Software	ReCycle 2.0	Win 98/ME/2000/NT4, PII 200, 64 MB RAM, Mac OS 8.6, Power PC 604/166, 64 MB RAM	2	8, 16, 24-bit	up to 1 MHz	WAV, AIFF, SDII, REX2, RCY	N/A
SoftLab-NSK	DDClip Pro 3.51	Pentium 200 MHz, 32 MB RAM	32	24-bit	96 kHz	WAV, AIFF, MP3, AVI, ADPCM/IMAADPCM, a-Law/u Law	DirectX
Sonic Foundry, Inc.	Sound Forge 6.0	200 MHz, 32 MB RAM, Win 98SE, Me, 2000, XP	2	24-bit, 32-bit	192 kHz	WAV, MP3, AIF, AVI, MOV, WMV, RM, OGG, PCA, WMA, OGG, AU/SND, DIG/SD, RAW, MPEG-1&2, VOX	DirectX
Steinberg	WaveLab 4.1	Pentium II 200 MHz or AMD K7 (Pentium III 500 MHz or AMD K7 recommended)	2	32-bit	192 kHz	WAV, AIFF, AU, RAW, SDII, Paris 24-bit, ulaw, MP3, Sun/Java, more	VST, DirectX, WaveLab
TC Works	Spark XL 2.8	Mac OS X, 128 MB RAM	2	32-bit	192 kHz	WAV, AIFF, SDII, W64, MP3 and all QuickTime Formats	VST, AU

● OUTSIDE STORAGE *continued from page 23*

for audio." With USB being ubiquitous on Macs and PCs and FireWire still optional on PCs, there has been a lot more development in audio devices for USB than for FireWire. Although Apple is bullish on FireWire, "Intel and Microsoft are strongly behind USB 2.0, and USB is cheaper, so the average PC user is way more likely to see an integrated USB solution on their motherboard," says Kuper.

Microsoft has delivered native USB 2.0 support in its first Service Pack to Windows XP. (Unlike FireWire, USB 2.0

wasn't ready when XP was first released.) Eighty percent of PCs shipped in 2003 are expected to have integrated USB 2.0 support. (Meanwhile, Apple says it is "watching" USB 2.0.) Numerous USB 2.0 CD-R and hard-drive products are already available, but none of the audio-centric drive vendors has taken the plunge yet. A number of the USB 2.0 drives that are currently available feature dual support for either USB 2.0 or FireWire, raising some enticing possibilities. Track count for USB 2.0 drives could be as good as FireWire drives as

long as the device has a 7,200 rpm rotation speed.

Another interesting development in USB storage is the appearance of several models of key-chain USB devices such as the ThumbDrive from Trek (see Fig. 3). These solid-state storage devices come in sizes from 16 MB all the way up to 1 GB. Although they're not fast enough to record and play back multitrack audio, they are a convenient way to carry around lots of small- to medium-size files that might come in handy. You could keep favorite

Number of Bundled Plug-ins	Sampler Support	Supports QuickTime and/or A/V Movies	Mixer	Automation	CD Burning	Control via MIDI	Pitch-shift Type	Time Compression/Expansion	Levels of Undo	View and Edit at Single-sample level	Special Features	List Price
45+	Yes	Yes	Yes	Yes	Yes	Yes	Traditional & Formant-preserving	Y/Y	Unlimited	Yes	Stereo & multitrack editor, real-time effects & EQ, looping, data analysis, mastering, batch processing	\$299
25	Yes	Yes	No	No	Yes	No	Traditional	Y/Y	Unlimited	Yes	ImpulseVerb sample-based reverb, Direct Red Book CD burning, multi-processor compatible	\$499
10	No	No	Yes	No	Yes	No	Traditional	Y/Y	1+	Yes	Plug-ins for converting LP/tape to CD, removing vocals	\$40
N/A	No	No	Yes	No	No	Yes	Traditional & Formant-preserving	Y/Y	500	No	Detects notes in audio files and allows user to edit pitch, time, formats of each note individually	\$395
N/A	No	No	Yes	No	No	Yes	Traditional & Formant-preserving	Y/Y	500	No	Detects notes in audio files and allows user to edit pitch time formats of each note individually	\$695
6	No	Yes	No	No	No	No	Formant-preserving	N/N	Unlimited	Yes	Positional 3D audio effects, Dolby Digital AC-3, 5.1 channels, MPEG-2 AAC	\$400
7	No	No	No	No	No	No	Formant-preserving	N/N	Unlimited	No	Very fast and easy editing, effects editable in layers	\$54
9	No	No	No	No	No	No	Formant-preserving	N/N	Unlimited	No	Positional 3D audio effects, fast and easy to use, effects editable in layers	\$160
5	Yes	Yes	Yes	Yes	No	Yes	Formant-preserving	Y/Y	Unlimited	Yes	Live input processing, MIDI & audio editing, supports WDM, Asio, MME and DirectSound, ReWire	\$45
N/A	No	No	No	No	No	No	Traditional & Formant-preserving	Y/Y	1	Yes	Specialized sample editor has editing functionality	\$190
9	Yes	Yes	Yes	Yes	Yes	Yes	Traditional & Formant-preserving	Y/Y	Multiple	Yes	Bundled with full 48-track MIDI sequencer + 2,000 loops & samples, 6 virtual instruments	\$100
10	Yes	Yes	Yes	Yes	Yes	Yes	Traditional & Formant-preserving	Y/Y	Multiple	No	13 virtual instruments, 3,200 loops & samples, MIDI editor, Live Mode, Video Creation	\$80
N/A	Yes	Yes	Yes	Yes	Yes	Yes	Traditional & Formant-preserving	Y/Y	Unlimited	Yes	Object oriented editing, supports surround sound formats through 5.1, 3rd party controller support	\$1,099
N/A	No	No	Yes	No	No	No	Traditional & Formant-preserving	Y/Y	Unlimited	No	Extremely fast editing, unique recording features	\$40
N/A	Yes	No	No	No	No	No	Traditional & Formant-preserving	Y/Y	1	Yes	Slices audio loops and exports to samplers, hardware and software, and saves in REX and Soundfont	\$189
N/A	Yes	Yes	Yes	No	No	No	Traditional	Y/Y	99	Yes	Up to two video tracks, fast editing, support of large AVI files, video recompression	\$199
18+	Yes	Yes	Yes	No	Yes	Yes	Traditional & Formant-preserving	Y/Y	Unlimited	Yes	Real-time nondestructive editing, multitask background rendering, modelless audio plug-in chainer	\$500
10+	No	No	Yes	Yes	Yes	Yes	Traditional & Formant-preserving	Y/Y	N/A	Yes	Audio montage for multi-track editing, audio analysis tools, UV22HR dithering, batch processing, scaled-down version (Essential) \$249	\$599
29	No	Yes	Yes	No	Yes	No	Traditional	Y/Y	Unlimited	Yes	Audio restoration analyzers, real-time effects matrix, synthesis, batch converter, direct CD burning	\$599

loops or drum replacement samples, test tones, plug-in presets, song ideas, or anything else to which transfer speed isn't critical.

BY ANY OTHER NAME

The best performance in notebook hard drives is still found in SCSI devices. CardBus-to-SCSI adapters open the world of SCSI performance to the mobile engineer, but in general the cost is higher than with FireWire. That's partly due to the fact that FireWire ports are built in to many

notebooks, whereas built-in SCSI ports are quite rare. Therefore, for starters you would have to purchase the adapter. The rest of the story is that the cost of SCSI hard drives is higher than that of ATA drives, so you get hit coming and going. Still, if performance is your top priority, SCSI is the way to go. Another option to consider is that Magma's CardBus-to-PCI expansion chassis is available with SCSI support built in.

The storage options for notebook-lugging musicians have never been bet-

ter. You can have any or all of the things that you desire in external storage: convenience, affordability, speed, noise-suppression, capacity, and compatibility. I still wouldn't turn up my nose at a hot-swappable SCSI-160 drive bay in my next notebook, but at least now I don't have to hold my breath.

Brian Smithers is working on retrofitting his calendar with support for FireWire drives to increase its storage capacity. In his spare time he teaches at Full Sail Real World Education in Winter Park, Florida.

Computer-Assisted Music-Education Software

Manufacturer	Product	Version	Type	Level	Minimum System Requirements	Special Features	List Price
Charanga Ltd.	Guitar Coach	N/A	Guitar lessons	Beginner	Win 3.1, 95, 98, 2000, ME, NT, XP, 16 MB RAM	130 lessons, 200 video clips, 50 studies and songs, real audio, tuner, metronome	\$40
Charanga Ltd.	Electric Guitar Coach	N/A	Electric guitar lessons	Beginner	Win 3.1, 95, 98, 2000, ME, NT, XP, 16 MB RAM	200 video clips, 150 lessons covering lead, rhythm, technique and chords, 9 famous songs	\$40
Charanga Ltd.	Keyboard Coach	N/A	Electronic keyboard lessons	Beginner	Win 98, ME, 2000, XP, 64MB RAM, Pentium PC 233MHz or faster	Keyboard Roll shows you how to play, Music Coach checks your playing, Video Coach with over 50 clips	\$50
ChordWizard Software Pty Ltd.	ChordWizard Gold	2.0	Guitar chord/scale reference	All levels	Win 95, 98, ME, NT4, 2000, XP, Pentium 60 MHz, 16 MB RAM, MIDI sound card	Workshop for all fretted instruments, includes multimedia music theory tutorials	\$45
Cool Breeze Systems, Inc.	Cool School Interactus	1-8	Software operation & production	All levels	Win 98, ME, XP, Mac 8, 9, X, 64 MB RAM	Interactive training CD-ROM, DVD and Web	\$50-\$100
Cool Breeze Systems, Inc.	www.CoolSchoolOnline.com	2.0	Software & production training	All levels	Win, Mac, QuickTime, Shockwave	Online courses & movie libraries - Pro Tools, DP, Logic, Cubase	\$50
Cool Breeze Systems, Inc.	CSi vol.1 - Pro Tools Basics	1.2	Interactive training CD-ROM	Intermediate	Win 98, ME, XP, Mac 8, 9, X, 64 MB RAM	Software simulations, movie tutorials, glossary, quizzing	\$100
Cool Breeze Systems, Inc.	CSi vol.2.1 - Pro Tools Tips & Plug-ins	2.1	Interactive training CD-ROM	All levels	Win 98, ME, XP, Mac 8, 9, X, 64 MB RAM	Software simulations, movie tutorials, glossary, quizzing	\$100
Cool Breeze Systems, Inc.	CSi vol.3 - Desktop Audio	3.1	Interactive training CD-ROM	Beginner	Win 98, ME, XP, Mac 8, 9, X, 64 MB RAM	Software simulations, movie tutorials, glossary, quizzing	\$80
Cool Breeze Systems, Inc.	CSi vol.4 - Logic Audio	4.1	Interactive training CD-ROM	Intermediate	Win 98, ME, XP, Mac 8, 9, X, 64 MB RAM	Software simulations, movie tutorials, glossary, quizzing	\$80
Cool Breeze Systems, Inc.	CSi vol.5 - Pro Tools 5	5.1	Interactive training CD-ROM	All levels	Win 98, ME, XP, Mac 8, 9, X, 64 MB RAM	Software simulations, movie tutorials, glossary, quizzing	\$100
Cool Breeze Systems, Inc.	CSi vol.6 - Digital Performer	6	Interactive training CD-ROM	Intermediate	Win 98, ME, XP, Mac 8, 9, X, 64 MB RAM	Software simulations, movie tutorials, glossary, quizzing	\$80
Cool Breeze Systems, Inc.	CSi vol.7 - Cubase SX	7	Interactive training CD-ROM	Intermediate	Win 98, ME, XP, Mac 8, 9, X, 64 MB RAM	Software simulations, movie tutorials, glossary, quizzing	\$80
Cool Breeze Systems, Inc.	CSi QuickStart - Mbox	1	Interactive training CD-ROM	Beginner	Win 98, ME, XP, Mac 8, 9, X, 64 MB RAM	Software simulations, movie tutorials, glossary, quizzing	\$60
Cool Breeze Systems, Inc.	CSi QuickStart - Plug-ins	1	Interactive training CD-ROM	All levels	Win 98, ME, XP, Mac 8, 9, X, 64 MB RAM	Movie tutorials, operational techniques, audio examples	\$60
Cool Breeze Systems, Inc.	CSi QuickStart - SampleCell	1	Interactive training CD-ROM	Intermediate	Win 98, ME, XP, Mac 8, 9, X, 64 MB RAM	Movie tutorials, operational techniques, audio examples	\$60
Datasonics	Mastering Music Prelude	3.3	Music lessons for ages 10-18	All levels	Win, IE 5.5, Pentium 266MHz, 96 MB RAM	Covers the school curriculum across all levels and aspects of music	\$446
Datasonics	Mastering Music Lab Pack	3.3	Music lessons for ages 10-18	All levels	Win, IE 5.5, Pentium 266MHz, 96 MB RAM	Unlimited site license covering music curriculum for all aspects of music	\$2,079
Datasonics	Mastering Music 5 Multi-User License	3.3	Music lessons for ages 10-18	All levels	Win, IE 5.5, Pentium 266MHz, 96 MB RAM	5 user licenses covering music curriculum with all aspects of music	\$1,485
Datasonics	Mastering Music Komposa	1.5	Lesson generator	All levels	Win, IE 5.5, Pentium 266MHz, 96 MB RAM	Generates lessons for mastering music	\$743
Datasonics	Music Master Professional	5.5	Sequencing, notation & audio	All levels	Win 95, 98, ME, 2000, XP, Pentium 266MHz, 96 MB RAM	Integrated MIDI sequencing, notation and digital audio	\$396
Datasonics	Music Master Publisher	5.5	Notation with MIDI sequencing	All levels	Win, Pentium 266MHz, 96 MB RAM	Plays all the notation symbols eg repeats, codas, dynamics, mordents, trills	\$198
Datasonics	Music Master Performa	5.5	Sequencing, audio, notation	All levels	Win, Pentium 266MHz, 96 MB RAM	Integrated MIDI and audio on one screen, Win XP-compatible	\$186
Electronic Courseware Systems, Inc.	Clef Notes	3.0/3.5	Note reading	Beginner	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10	Includes note reading on treble, bass, alto, or tenor clef	\$40
Electronic Courseware Systems, Inc.	Cloud 9 Music	2.0	Music fundamentals	Beginner	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10	Audio directions. Program is exploratory for ages 3 - 9.	\$40
Electronic Courseware Systems, Inc.	Ear Challenger	4.0	Ear training and tonal memory	All levels	Win 95/98/2000/XP	Designed to assist you in increasing your ability to remember a series of pitches	\$40
Electronic Courseware Systems, Inc.	Super Ear Challenger	2.3	Ear training and tonal memory	All levels	Mac OS 7, 8, 9 and 10	Designed to develop ear training skills through memory and color	\$40
Electronic Courseware Systems, Inc.	Early Keyboard Skills	5.0	Piano skill development	Beginner	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10	Introduction to basic piano skills such as note reading and piano key names	\$40
Electronic Courseware Systems, Inc.	Early Music Skills	5.0	Music fundamentals	Beginner	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10	Introduces pre-note reading concepts to young children	\$40
Electronic Courseware Systems, Inc.	Echos	3.0	Sight-reading piano skills	Beginner	Win 95/98/2000/XP	Implements concepts of sight-reading using MIDI keyboard	\$80

Computer-Assisted Music-Education Software

Manufacturer	Product	Version	Type	Level	Minimum System Requirements	Special Features	List Price
Electronic Courseware Systems, Inc.	Elements of Music	3.0/4.1	Theory, note reading	Beginner	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode)	May be used by children or adults for entry-level studies in music	\$80
Electronic Courseware Systems, Inc.	Keyboard Arpeggios	2.42/2.2	Piano skill development	Beginner	Win 95/98/2000/XP, Mac OS 7, 8, 9. Requires MIDI	Review piano arpeggio performance and fingerings to increase performance skills	\$40
Electronic Courseware Systems, Inc.	Keyboard Fingerings	2.4/2.3	Piano skill development	Beginner	Win 95/98/2000/XP, Mac OS 7, 8, 9. Requires MIDI	Review standard and special fingerings for major, natural minor and harmonic minor scales	\$40
Electronic Courseware Systems, Inc.	Keyboard Note Drill	3.0/2.2	Note reading	Beginner	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode). MIDI optional	Varying levels of difficulty, helps develop note reading skills. May be used with or without MIDI.	\$40
Electronic Courseware Systems, Inc.	Keyboard Tutor	2.0	Piano skill development	Beginner	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode). MIDI optional	Introduction to basic piano skills. Unlimited practice of skills offered.	\$40
Electronic Courseware Systems, Inc.	Keyboard Blues	3.0/3.5	Instrumental performance	Intermediate	Win 95/98/2000/XP, Mac OS 7, 8, 9. MIDI required	Introduces simple blues chords, user can practice improvising with background chords	\$80
Electronic Courseware Systems, Inc.	Keyboard Chords	3.0/3.4	Theory	Intermediate	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode). MIDI optional	Drill and practice program which teaches major, minor, diminished, & augmented chords. Keeps records.	\$80
Electronic Courseware Systems, Inc.	Keyboard Jazz Harmonies	3.0/2.1	Theory	Advanced	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode). MIDI optional	Study chord symbols and 7th chords. Keeps records.	\$80
Electronic Courseware Systems, Inc.	Keyboard Extended Jazz Harmonies	3.0/2.1	Theory, ear training	Advanced	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode). MIDI optional	Learn 9th, 11th, and 13th chords both aurally and visually. Keeps records.	\$80
Electronic Courseware Systems, Inc.	Keyboard Intervals	3.0/2.3	Theory	Intermediate	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode). MIDI optional	Learn major, minor, diminished, and augmented intervals. Keeps student records	\$80
Electronic Courseware Systems, Inc.	Keyboard Speed Reading	4.0/3.3	Instrumental performance	Intermediate	Win 95/98/2000/XP, Mac OS 7, 8, 9. MIDI optional	Timed drills help develop quicker note reading skills. Keeps student records.	\$40
Electronic Courseware Systems, Inc.	Keyboard Kapers	5.0	Ear training /note reading	All levels	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10. MIDI optional	Note reading, ear training, piano skill development games. Hall of Fame displays high scores.	\$40
Electronic Courseware Systems, Inc.	KIDS (Keyboard Introductory Development Series)	2.1/1.5	Note reading and piano skills	Beginner	Win 95/98/2000/XP, Mac OS 7, 8, 9. MIDI optional	Includes studies in solfège, note reading, and finger numbers for piano playing, many activities	\$50
Electronic Courseware Systems, Inc.	Musical Stairs	3.0/2.2	Theory	Beginner	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode). MIDI optional	Aural-visual game introduces intervallic relationships to young students	\$40
Electronic Courseware Systems, Inc.	Musicus	5.0	Rhythm comprehension	Beginner	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10	May be used in Spanish or English. Fun and colorful games teaching note values and musical meter.	\$30
Electronic Courseware Systems, Inc.	Challenge Musicus	5.0	Rhythm skills development	All levels	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10	Beginners-Advanced. colorful games, learn about notes, rhythms and meter.	\$30
Electronic Courseware Systems, Inc.	Super Musicus	2.0/4.2	Note/rhythmic meter recognition	Intermediate	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode)	Develops understanding of the relative length of notes and placement in music meter.	\$30
Electronic Courseware Systems, Inc.	Note Detective	2.1/2.7	Piano skill development	Beginner	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode). MIDI optional	Discover basic piano skills with the help of Sherlock	\$80
Electronic Courseware Systems, Inc.	Note Speller	3.0/4.7	Note reading	Beginner	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode). MIDI optional	Timed games which develop note reading skills. Treble, Bass, or Alto Clef.	\$40
Electronic Courseware Systems, Inc.	Ricochet	1.4	Piano skills, ear training	Beginner	Win 95/98/2000/XP. MIDI optional	Learn to play popular tunes by playing the piano key that a colored ball has highlighted	\$30
Electronic Courseware Systems, Inc.	Rhythm Performance Test-Revised	2.4	Skill assessment	Beginner	Win 95/98/2000/XP	Assess rhythmic performance skills or overall music skills	\$100
Electronic Courseware Systems, Inc.	Smack-a-Note	2.0	Note reading, piano keys	All levels	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10	Click on the "critters" that match the note names presented. Variety of skills included.	\$20
Electronic Courseware Systems, Inc.	Symbol Simon	1.92	Music symbols and terminology	Intermediate	Win 95/98/2000/XP	Team up with musical symbol sleuth, Simon, to learn music symbols and their definitions	\$40
Electronic Courseware Systems, Inc.	Tap It	3.6/3.8	Rhythm skills	Beginner	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode)	Learn to keep a steady beat by listening or reading random rhythms. Full record keeping	\$40
Electronic Courseware Systems, Inc.	Tap It II	3.1/4.6	Rhythm skills development	Intermediate	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode)	Tapping drills include syncopation, eighth and sixteenth note values. Varying tempos available.	\$40
Electronic Courseware Systems, Inc.	Toon Up	1.2.2	Ear training	Beginner	Win 95/98/2000/XP	Develops listening skills and intonation	\$40
Electronic Courseware Systems, Inc.	Tune It II	3.6	Ear training	Beginner	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode)	Practice in matching pitches and getting two pitches "in tune"	\$40
Electronic Courseware Systems, Inc.	Audio Mirror	3.1	Vocal/pitch matching	Intermediate	Win 95/98/2000/XP	Sing or play into a mic attached to computer to match the sound presented. See if flat or sharp.	\$80
Electronic Courseware Systems, Inc.	MIDI Jazz Improvisation I	N/A	Instrumental performance	Intermediate	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode). MIDI required	Develop improvisational skills. Requires software sequencer which can read standard MIDI files.	\$60

Computer-Assisted Music-Education Software

Manufacturer	Product	Version	Type	Level	Minimum System Requirements	Special Features	List Price
Electronic Courseware Systems, Inc.	MIDI Jazz Improvisation II	N/A	Instrumental performance	Advanced	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode). MIDI required.	Develop improvisational skills. Requires software sequencer which reads standard MIDI file.	\$60
Electronic Courseware Systems, Inc.	Music Composer Quiz	3.0/2.1	Music appreciation	Advanced	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode).	Over 100 quiz questions are randomly chosen for testing knowledge. Student records retained.	\$40
Electronic Courseware Systems, Inc.	Music Flash Cards	3.0/2.8	Theory	Intermediate	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode).	Includes drills on note naming, scales, key signatures, intervals and basic chords	\$100
Electronic Courseware Systems, Inc.	Music Terminology	3.0/3.1	Music fundamentals	Intermediate	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode).	Glossary of terms included along with 5 different types of testing	\$40
Electronic Courseware Systems, Inc.	Music Terminology for Bands, Orchestras & Choirs	2.0/2.3	Music fundamentals	Intermediate	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode).	Quizzes on terms specific to each ensemble, general musical terms with definitions	\$40
Electronic Courseware Systems, Inc.	Rhythm Factory	1.0	Rhythm skills development	Intermediate	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode).	Verbal instructions, recordkeeping and a colorful "factory" environment.	\$80
Electronic Courseware Systems, Inc.	Aural Skills Trainer	3.0/3.7	Ear training	Advanced	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode). MIDI required.	Choose intervals, basic chords or seventh chords for studies and quizzing. Keeps records.	\$100
Electronic Courseware Systems, Inc.	Functional Harmony	3.0/4.1	Theory	Advanced	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode). MIDI required.	Choose studies: basic chords, diatonic 7ths, secondary dominants, or borrowed/altered chords	\$150
Electronic Courseware Systems, Inc.	Harmonic Progressions	3.0/3.8	Theory/ear training	Advanced	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode). MIDI required.	Analyze chords, harmonic dictation and aural identification. Keeps records.	\$200
Electronic Courseware Systems, Inc.	Music History Review: Composers	3.0/2.0	Music appreciation	Advanced	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode).	Test knowledge of composers from the Renaissance through the 20th Century. Keeps records.	\$40
Electronic Courseware Systems, Inc.	Musique	3.1	Theory, ear training	Advanced	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode). MIDI required.	Collection of software with self-paced exercises for theory instruction	\$595
Electronic Courseware Systems, Inc.	TimeSketch Editor	4.5	Listening analysis	All levels	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode).	Create thematic analysis of audio CD, MP3, MIDI, WAV and AIFF files	\$100
Electronic Courseware Systems, Inc.	Bach Magnificat/Vivaldi Gloria Sketches	N/A	Listening analysis	All levels	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode).	See the form analysis of each piece as you listen to the performance	\$40
Electronic Courseware Systems, Inc.	Bach Toccata & Fugue Sketch	N/A	Listening analysis	All levels	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode).	See the form analysis of this work as you listen to the performance	\$40
Electronic Courseware Systems, Inc.	Beethoven Piano Concerto No. 3 Sketch	N/A	Listening analysis	All levels	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode).	See the form analysis of this piece as you listen to the performance	\$40
Electronic Courseware Systems, Inc.	Beethoven Pathetique Sonata Sketch	N/A	Listening analysis	All levels	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode).	See the form analysis of this piece as you listen to the performance.	\$40
Electronic Courseware Systems, Inc.	Beethoven Symphony No. 5 Sketch	N/A	Listening analysis	All levels	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode).	See the form analysis of this work as you listen to the performance	\$40
Electronic Courseware Systems, Inc.	Berlioz Symphony Fantastique Sketch	N/A	Listening analysis	All levels	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode).	See the form analysis of this piece as you listen to the performance	\$40
Electronic Courseware Systems, Inc.	Brahms Symphony No. 3 Sketch	N/A	Listening analysis	All levels	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode).	See the form analysis of this piece as you listen to the performance	\$40
Electronic Courseware Systems, Inc.	Brubeck Music Analyzed!	N/A	Listening analysis	All levels	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode).	See the form analysis of each piece as you listen to the performances from <i>Time Out</i> album	\$40
Electronic Courseware Systems, Inc.	Dvorak New World Symphony Sketch	N/A	Listening analysis	All levels	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode).	See the form analysis of this piece as you listen to the performance	\$40
Electronic Courseware Systems, Inc.	Miles Davis Music Analyzed!	N/A	Listening analysis	All levels	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode).	See the form analysis of each piece as you listen to the performances from <i>Kind of Blue</i> album.	\$40
Electronic Courseware Systems, Inc.	Grainger Lincolnshire Posy Sketch	N/A	Listening analysis	All levels	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode).	See the form analysis of this piece as you listen to the performance	\$40
Electronic Courseware Systems, Inc.	Moussorgsky Pictures at an Exhibition Sketch	N/A	Listening analysis	All levels	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode).	See the form analysis of this piece as you listen to the performance	\$40
Electronic Courseware Systems, Inc.	Mozart Requiem Sketch	N/A	Listening analysis	All levels	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode).	See thematic "bubble chart" analysis as you listen to an orchestral performance of the work	\$40
Electronic Courseware Systems, Inc.	Mozart Symphony No. 40 Sketch	N/A	Listening analysis	All levels	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode).	See the form analysis of this piece as you listen to the performance	\$40
Electronic Courseware Systems, Inc.	Schubert Unfinished Symphony Sketch	N/A	Listening analysis	All levels	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode).	See the form analysis of this piece as you listen to the performance	\$40
Electronic Courseware Systems, Inc.	Vaughan Williams/Barber Sketches	N/A	Listening analysis	All levels	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode).	See the form analysis of each piece as you listen to the performances	\$40
Electronic Courseware Systems, Inc.	Adventures in Musicland	3.1	Note reading, ear training	Beginner	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode).	Features characters from <i>Alice in Wonderland</i> by Lewis Carroll. For ages 4 through 12.	\$50
Electronic Courseware Systems, Inc.	Digital Music Mentor	1.0/1.11	Instrument/vocal performance	All levels	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode).	Record exercises which others can study and then record their performance, portfolio builder	\$40

Computer-Assisted Music-Education Software

Manufacturer	Product	Version	Type	Level	Minimum System Requirements	Special Features	List Price
Electronic Courseware Systems, Inc.	Spell and Define	3.0/1.2	Terminology/music fundamentals	All levels	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10 (in classic mode)	Teachers can create and customize vocabularies for student studies	\$25
Electronic Courseware Systems, Inc.	ECS Music Suite	N/A	Instrumental/vocal analysis	All levels	Win 95/98/2000/XP	This set includes the ECS Music Metronome and the ECS Music Tuner	\$40
Electronic Courseware Systems, Inc.	ECS Music Metronome	N/A	Performance	All levels	Win 95/98/2000/XP, Mac OS 7, 8, 9 and 10	Turn your computer into a metronome, to assist in playing accurately in tempo	\$20
Electronic Courseware Systems, Inc.	ECS Music Tuner	N/A	Listening analysis/performance	All levels	Win 95/98/2000/XP	Software tool designed to help user perform with better intonation, shows if you are sharp or flat	\$30
eMedia Music Corporation	eMedia Guitar Method	N/A	Beginner guitar instructional	Beginner	Win 95 and higher, Mac OS 7.5 and higher	Animated fretboard, digital metronome, chord dictionary, automatic tuner, video instruction, looping	\$60
eMedia Music Corporation	eMedia Intermediate Guitar Method	N/A	Guitar instruction	Intermediate	Win 95 and higher, 155 lessons, includes: OS 7.5 and higher, 16MB Free RAM	Animated Fretboard, Automatic Tuner, Digital Metronome, Scale Dictionary	\$60
eMedia Music Corporation	eMedia Guitar Songs	N/A	Guitar instruction	Intermediate	Win 95 and higher, MAC OS 7.5 and higher, 16 MB Free RAM	Over 20 Hit Songs by The Who, Peter Frampton, Heart, Stevie Ray Vaughn, Eric Clapton, Grateful Dead	\$30
eMedia Music Corporation	eMedia Piano & Keyboard Method	N/A	Instructional performance	Beginner	Win: Pentium PC, Win 95/98/NT/2000/Me/XP, 32 MB free RAM, Mac: Power PC, System 7.53+ or OSX10+	Animated Keyboard displays correct fingering as music plays, features 70 full motion videos	\$60
eMedia Music Corporation	eMedia Bass Method	N/A	Bass instruction	Beginner	Win 95 and higher, MAC OS 7.5 and higher 16 MB Free RAM	114 lessons, includes Animated Fretboard, Video instruction, Audio with Tracking, Digital Metronome	\$60
eMedia Music Corporation	eMedia Blues Guitar Legends	N/A	Guitar instruction	Intermediate	Win 95 and higher, Mac OS 7.5 and higher, 16 MB Free Ram	10 original artist recordings including The Allman Bros., Robert Cray, Stevie Ray Vaughan, B.B. King	\$30
FMJ-Software	Chromatia Tuner	2.6	Chromatic I multi-temperament	All levels	Win 9X, ME, NT, 2000, XP	Instrument tuning software. 20 different temperaments, from historic tunings to modern.	\$25
GenieSys Voice L.C.	MusicBall	1.0	Music game	Beginner	Win ME with DirectX 8.0, 64 MB, P-II-300	16 MIDI-tracks	\$30
JustEnough Learning Co.	JustEnough Learning Kit	N/A	Instrumental performance	Beginner	Win 95, 98, ME, XP, 2000, 64 MB RAM, 20 Mhz, 1Power PC, 166 Mhz Pentium or compatible	Video game, DVD player compatible. Four ways to learn. Interactive Virtual Jam Session.	\$20
Line 6	GuitarPort	2.0	Artist and Berklee lessons	All levels	USB-equipped PCs that run Win XP, 2000, ME, 98SE	Vetta-based amp modeling and effects, 24-bit USB I/O, online tablature, Berklee and artist lessons	\$229
MIBAC Music Software, Inc.	Music Lessons I Fundamentals (Windows)	N/A	Theory, ear-training	All levels	Win 98, ME, NT4, 2000, XP, Sound Blaster and MIDI compatible	Multiple skill levels, on-screen help, built-in music theory reference, record keeping	\$119
MIBAC Music Software, Inc.	Music Lessons I Fundamentals (Mac)	N/A	Theory, ear-training	All levels	Mac 68 K or PowerMac, Mac OS 7.5 or higher, Mac OS 8 or Mac OS 9 (MIDI optional)	Multiple skill levels, on-screen help, built in music theory reference, record keeping	\$149
MIBAC Music Software, Inc.	Music Lessons II Chords and Harmony	N/A	Theory, ear-training	Advanced	Win 98, NT4, 2000, XP, Mac OS 7.5 or higher, Mac OS 8 or Mac OS 9	Develops all skill areas: visual recognition, notation, playing (piano & guitar) and ear training	\$149
MIDIWorks Interactive	Composer Notes	2002	Composition & instrumentation	Advanced	Win 95, Mac OS 8.1	Interactive electronic book	\$250
MIDIWorks Interactive	Junior Music Toolkit	N/A	Elementary creative music	Beginner	Win 95, Mac OS 8.2	Interactive electronic book	\$90
MIDIWorks Interactive	Composer Notes Vol. 1	N/A	Performance/writing	All levels	Win 95 or higher, 64 MB application RAM, Mac OS 8 or higher, 64 MB application RAM	Electronic book contains learning framework addressing composition for acoustic instruments & MIDI	\$250
MIDIworks Interactive	Composer Notes Jr. Music Toolkit	N/A	Creativity	Beginner	Win 95 or higher, OS 8 or higher	Offers music activities for the elementary classroom	\$90
MIDIworks Interactive	Composer Notes Student Edition	N/A	Composition	All levels	Win 95 or higher, Mac OS 8 or higher	Program designed for single student use in studying composing and arranging music	\$50
miniMusic	BugBand	1.0.5	Sight reading	Beginner	Palm OS 3.0	Piano and guitar interface. Treble and bass clef	\$12
miniMusic	EarTrain	1.0	Ear-training	Beginner	PalmOS 3.0		\$12
MJ and Associates	Global Voices in Song Four Swazi Songs	N/A	Vocal performance	All levels	Win 95 or higher, 32 MB RAM, Mac OS 7.5.3 or higher, 32 MB RAM	Presents vocal music of a another culture using video materials and multimedia	\$200
MJ and Associates	Global Voices in Song Folk Songs of Hungary	N/A	Vocal performance/multi-cultural	All levels	Win 95 or higher, 32 MB RAM, Mac OS 7.5.3 or higher, 32 MB RAM	See a model performance, pronounced text, voice parts, choreography, written text & translation	\$200
Optek Music Systems, Inc.	The Fretlight Guitar	400 Ser.	Guitar education	All levels	None	Lights in the fretboard show chords, scales, riffs, songs	\$599
Optek Music Systems, Inc.	The Fretlight Retrofit Neck	400 Ser.	Guitar education	All levels	None	Add-on Fretlight neck for any standard start body	\$299
PG Music, Inc.	Band-in-a-Box	12	Instrumental performance, sight	All levels	Win, 16 MB	Automatic accompaniment	\$88

Computer-Assisted Music-Education Software

Manufacturer	Product	Version	Type	Level	Minimum System Requirements	Special Features	List Price
Pianomouse.com	Music Theory FUNDamentals	N/A	Theory	Beginner	Win 95 or higher, 32 MB RAM, soundcard, Mac OS 8.1-9.1, 32 MB RAM	16 Lessons and games introducing basics of keyboard, pitch, music alphabet, notes and other areas	\$20
Pianomouse.com	Pianomouse Meets the Great Composers	N/A	Music appreciation	Intermediate	Win 95-ME, 32 MB RAM, soundcard, Mac OS 8.1-9.1, 32 MB RAM	Includes narrated composer biographies, puzzles, and games about 8 composers	\$20
Play Music Inc.	Play Guitar	2.0	Instrumental performance	Beginner	Win	Taught by GIT Instructor Ross Bolton, MIDI animated fretboard w/video synching	\$40
Play Music Inc.	Play Blues Guitar	2.0	Instrumental performance	All levels	Win	MIDI animated fretboard, 90 minutes video & animation, taught by GIT Instructor Keith Wyatt	\$40
Play Music Inc.	Play Rock Guitar	2.0	Instrumental performance	Intermediate	Win	MIDI animated fretboard, Taught by GIT Instructor Keith Wyatt	\$40
Pygraphics	3D Java	1.2.9	Drill design software	All levels	Win 95 or higher or Mac OS X, 400 mhz, 128 MB of RAM	Drill design software for marching bands	\$799
Pygraphics	Online Amadeus	3.1.0	Pitch and rhythm training	Beginner	Win 95 or higher, 64 MB of RAM	Used with Standard of Excellence software	\$295
Rising Software	Auralia	2.1	Ear-training	All levels	Win 95, 98, ME, NT, 2000, XP, Mac OS X	26 Topics, student tracking, customizable content	\$149
Rising Software	Musition	2.0	Theory	All levels	Win 95, 98, ME, NT, 2000, XP	25 Topics, student tracking, customizable content	\$149
SDG Soft	Guitar Magic	III	Instrumental - guitar	All levels	PC, Pentium 233, CD-ROM	University level guitar education	\$289
Sibelius Software	Teaching Tools	N/A	Music fundamentals, theory	Beginner	Win 95, 98, Me, 2000, XP, NT4 or higher, 32 MB+ RAM, Mac G4, G3, iMac OS8.6 to 101 or later, 15 MB+ RAM	Exercise, worksheets, and other educational resources which help teach music with Sibelius software	\$69
Spring of Knowledge, Inc.	Guitar Magic	III	Instrumental - guitar	All levels	PC Pentium 233, CD-ROM/DVD	University-level guitar education	\$289
Spring of Knowledge, Inc.	Bass Magic	I	Instrumental - bass guitar	All levels	PC Pentium 233, CD-ROM/DVD	University-level bass guitar education	\$199
SSoM Software	Music Admin Pro	3	Administration software	All levels	Win 95 to XP, NT, Mac OS 8 to OS C	Handles all aspects of running a music dept, music school, or band program	\$595
Trail Creek Systems	Ear Training Expedition Part 1	N/A	Ear training	Intermediate	Win 95 or higher	Covers pitch register, dictation, intervals, and scales	\$60
Trail Creek Systems	Ear Training Expedition Part 2	N/A	Ear training	Intermediate	Win 95 or higher	Covers inverted triads, augmented & diminished, rhythm, and circle of 5ths	\$60
Virtual Virtuoso	Practice Assistant	1.31	Studies and etudes for strings	All levels	Win	Plays at any tempo. Helps with intonation and rhythm.	\$59
Virtual Virtuoso	Performance Assistant	2.0	Concertos & pieces for strings	All levels	Win	Plays accompaniment and/or solo, at any tempo	\$20
Virtual Virtuoso	Scale Master with MIDI Metronome	1.2	Scales & arpeggios for strings	All levels	Win	Plays all scales, any tempo. Displays notation on screen.	\$25
World Wide Woodshed	SlowGold	7	Slow down/transcribe/practice	All levels	Win 95, 98, NT, 2000, ME, XP, 300 MHz Pentium, 32 MB RAM	Sound quality, transposition, easy to use, many helpful features	\$50
World Wide Woodshed	SlowBlast!	N/A	Slow down/transcribe/practice	All levels	Win 95, 98, NT, 2000, ME, XP, sound card or chip, 300 MHz Pentium	Quick and easy, slow down or speed up, wave file support, real-time	\$20

● CLOSING THE LOOP *continued from page 18*

display will create a new slice marker. Markers can be moved to any location within the loop by clicking and dragging on the triangular flag at their top.

In Acid, users will again open the Track Properties display and go into the Stretch tab. Then click with the right mouse button in the waveform display. Selecting Insert Marker from the resulting contextual menu will

make a new slice point in the file. Markers can be moved to new positions by clicking and dragging on the brown flag at the top of each marker.

Live uses the concept of Grid markers and Warp markers, which may be slightly counterintuitive for people accustomed to the ReCycle model. Grid markers represent Live's tempo map superimposed over the loop or file. You can assign a grid position to any point

within an audio file. Double-clicking on any marker number will turn it into a Warp marker; click-and-drag on Warp markers to move them to any point in the file or loop (see Fig. 5).

When working with Warp markers, begin with the first beat in the loop, and then proceed from left to right. Any markers located to the right of

continued on page 64

Multi-Tool For Musicians

audioMIDI.com SOFTWARE PLUG-ins HARDware PRO-audio SYNTHS & SAMPLERS accessories BRANDS

SEQUENCERS AUDIO SYNTHESIZERS HARDWARE EDITORS NOTATION INSTRUCTIONAL SOUNDS UPDATES

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SampleTank 2 XL

Every now and again something evolves into something SPECIAL, something USEFUL, something that performs a MULTITUDE of tasks in a straight forward elegant fashion. Today that something is IK's SampleTank 2 XL. The complete sound module workstation for the Mac or PC.

Multi-Timbral

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Over 4.5 Gigabytes of high quality samples: Bass, Drums, Guitars, Orchestral, Ethnic, Organs, Percussion, Pianos, Strings, Brass, Vocals, Synths and Loops. SampleTank 2 XL has it all. 8 CD's with 1,500 sounds.

Multiple Sample Engine Technologies

Three engines for traditional resampling, pitch shift/time stretch and STRETCH™ mode allowing you to play chords with single phrases, achieve greater realism in transposition, gliding and pitch bending of notes. Independently control the pitch tempo and harmonics of loops and instruments. Sync any loop to any tempo and more.

Multiple Built-In DSP Effects

SampleTank 2 incorporates a wealth of DSP processing including components from IK's award-winning AmpliTube™ and T-Racks™ software. Produce album quality music right out of the box!

Multiple Platforms Supported

Supporting more than 9 platforms SampleTank 2 works in Mac OS X, OS 9, Windows, VST, RTAS, DXi, MAS and Audio Units. This allows SampleTank 2 to plug-in to your choice of ProTools, Cubase, Sonar, Digital Performer, Logic and more!

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Computer-Based Digital Audio Workstations

Manufacturer	Product	Analog I/O	Digital I/O	Platform Version	Bus Type	Plug-In Formats Supported	Sample Rate	A/D/A Converter/Bit Rate
Aardvark	Aark 24	(8/8) 1/4" balanced	(2/2) S/PDIF (RCA optical) (8/8) ADAT (optical)	Win, Mac	PCI	GSIF, ASIO 2, A/WDM, VST	32, 44.1, 48 kHz	24-bit
Aardvark	Direct Mix USB3	(3/3), (2) 1/4" line, mic/guitar, headphone	N/A	Win, Mac	USB	USB audio standard	44.1, 48 kHz	24-bit
Aardvark	Direct Pro 24/96	(4/6), (4) XLR/mic-1/4" line in, (6) line out, headphone	(2/2) S/PDIF, RCA	Win, Mac	PCI	GSIF, ASIO 2, A/WDM, VST	32, 44.1, 48, 96 kHz	24-bit
Aardvark	Direct Pro LX6	(4/6) 1/4" line, headphone	(2/2) S/PDIF (RCA)	Win, Mac	PCI	GSIF, ASIO 2, A/WDM, VST	32, 44.1, 48, 96 kHz	24-bit
Aardvark	Direct Pro Q10	(8) XLR mic or 1/4" line in, 10 1/4"	(2/2) S/PDIF (RCA)	Win, Mac	PCI	GSIF, ASIO 2, A/WDM, VST	32, 44.1, 48, 96 kHz	24-bit
Alesis	ADAT/EDIT 2.0	ADAT Optical	ADAT optical	Win 95/98/NT/2000/NP, Mac	PCI	N/A	44.1, 48 kHz	N/A
Antex	SC22	2/2	N/A	Win 95/98/NT/2000/XP and WMD	PCI	DirectX	6.25-50 kHz	20-bit
Antex	SC2000	(4/4) XLR	(1/1) XLR AES/EBU, S/PDIF	Win 95/98/NT/2000/XP and WMD	PCI	DirectX	6.25-50 kHz	20-bit
Apogee Electronics	Native Tools Studio Edition	16	16	Win, Mac	PCI	VST, DirectX	44.1, 48, 88.2, 96 kHz	16/20/24-bit
Audiotrak	Maya 44 USB	(4/4) RCA	Optical out	Win, Mac OS 10.x	USB	N/A	44, 48 kHz	16-bit
Audiotrak	Maya 44 mk II	(4/4) 1/4"	S/PDIF coaxial and optical out	Win	PCI	N/A	96 kHz	24-bit
Audiotrak	Inca 88 mk II	(8/8) 1/4"	N/A	Win	PCI	N/A	24 kHz	16-bit
Audiotrak	Optoplay	0/2	(0/1) stereo S/PDIF optical	Win, Mac	USB	N/A	96 kHz	24-bit
Audiotrak	Prodigy 7.1	(2/8) 3.5mm (1/8")	(1/1) stereo coaxial	Win	PCI	N/A	96 kHz in, 192 kHz out	24-bit
Audiotrak	Prodigy192	(2/6) 3.5mm (1/8")	Coaxial and optical out	Win	PCI	N/A	96 kHz in, 192 kHz out	24-bit
Audiotrak	Maya EX	(2/6) RCA	(1/1) optical	Win	USB	N/A	44.1, 48 kHz	16-bit
Audiotrak	Maya EX7	(0/8) RCA	(1) out optical	Win	USB	N/A	44.1, 48 kHz	16-bit
Audiotrak	MI/ODI/O	N/A	(1) optical in, (1) coaxial in/out	Win, Mac	N/A	N/A	192 kHz	
BIAS Inc.	Deck 3.5	64 - interface dependent	64 - interface dependent	Mac	N/A	VST	60 kHz	N/A
CreamWare	Luna II	Stereo 1/4"	Coaxial	Win, Mac 9.2.2	PCI/DSP	N/A	N/A	24-bit
CreamWare	Luna II EX	Stereo 1/4"	Coaxial	Win, Mac 9.2.2	PCI/DSP	Proprietary	32, 44.1, 48, 96 kHz	24-bit
CreamWare	PowerSampler II	Stereo TRS	Coaxial	Win, Mac 9.2.2	PCI/DSP	Proprietary	32, 44.1, 48, 96 kHz	24-bit
CreamWare	PowerSampler II EX	Stereo 1/4"	Coaxial	Win, Mac 9.2.2	PCI/DSP	Proprietary	32, 44.1, 48, 96 kHz	24-bit
CreamWare	PulsarII Classic	(2) RCA	RCA unbalanced	Win, Mac 9.2.2	PCI/DSP	Proprietary	32, 44.1, 48, 96 kHz	24-bit
CreamWare	PowerPulsar 24ADAT	N/A	(24) ADAT	Win, Mac 9.2.2	PCI/DSP	Proprietary	32, 44.1, 48, 96 kHz	24-bit
CreamWare	Scope/SP Z-Link	RCA in/out	(16) Z-Link, (8) ADAT	Win, Mac 9.2.2	PCI/DSP	Proprietary	32, 44.1, 48, 96 kHz	24-bit
CreamWare	PowerPulsar Plus	XLR in/out	AES-EBU	Win, Mac 9.2.2	PCI/DSP	Proprietary	32, 44.1, 48, 96 kHz	24-bit
CreamWare	PowerPulsar Classic	(2) RCA	RCA unbalanced	Win, Mac 9.2.2	PCI/DSP	Proprietary	32, 44.1, 48, 96 kHz	24-bit
CreamWare	PowerPulsar Z-Link	RCA in/out	(16) Z-Link (8) ADAT, S/PDIF in/out	Win, Mac 9.2.2	PCI/DSP	Proprietary	32, 44.1, 48, 96 kHz	24-bit
CreamWare	PulsarII Plus	XLR in/out	AES-EBU	Win, Mac no OSX	PCI/DSP	Proprietary	32, 44.1, 48, 96 kHz	24-bit
CreamWare	PulsarII Z-Link	RCA in/out	(16) Z-Link (8) ADAT, S/PDIF in/out	Win, Mac 9.2.2	PCI/DSP	Proprietary	32, 44.1, 48, 96 kHz	24-bit
CreamWare	PulsarII 24ADAT	N/A	(24) ADAT	Win, Mac 9.2.2	PCI/DSP	Proprietary	32, 44.1, 48, 96 kHz	24-bit
CreamWare	SCOPE/SP 24ADAT	N/A	(24) ADAT	Win, Mac 9.2.2	PCI/DSP	Proprietary	32, 44.1, 48, 96 kHz	24-bit
CreamWare	Scope/SP Classic	RCA in/out	RCA unbalanced	Win, Mac 9.2.2	PCI/DSP	Proprietary	32, 44.1, 48, 96 kHz	24-bit

Digital Recorder Resolutions (max)	Sync Types	MIDI Control	Tracks/Virtual Tracks	# of Locate Points	Effects/Dynamic Processing	Additional Features	List Price
24-bit	Word clock, S/PDIF, MTC, ADAT	Yes	10/unlimited	N/A	N/N	Low jitter clock, DSP, digital peak metering premium ND, full duplex, shielded PCI card	\$899
24-bit	N/A	No	2/8	N/A	N/N	Solid steel unit, 24-bit A/D, guitar in, self-powered USB, Record LEDs	\$299
24-bit	MTC, S/PDIF	Yes	4/unlimited	N/A	Y/Y	4 class A mic pres, DSP compressor, EQ, reverb, full duplex, shielded PCI card	\$699
24-bit	MTC, S/PDIF	Yes	4/unlimited	N/A	Y/Y	Premium A/D, DSP compressor, EQ, reverb, full duplex, shielded PCI card	\$499
24-bit	MTC, S/PDIF, word clock	Yes	10/unlimited	N/A	Y/Y	8 class A mic preamps, 2 EFR guitar inputs, shielded PCI card, no mixer required, easy monitoring	\$999
24-bit	ADAT sync in/out	Yes	16/8	16 (ADAT/connect)	Y/Y	Sample-accurate transfer, zero latency monitoring, ASIO 2.0 support	\$399
N/A	LTC, SMPTE, word clock	No	4 stereo	N/A	N/N	Multi-card capability, Wintel & Alpha processor compatible	\$595
N/A	SMPTE read/write, video, VITC and LTC, word clock	Yes	8 stereo	N/A	N/N	Multicard capability, Wintel & Alpha processor compatible, LTC/VITC SMPTE read and generate sample	\$895
N/A	Word clock, digital formats	Yes	N/A	Unlimited	Y/Y	Surround, EDL, unlimited undo w/history, VST instr., import OMF, REX, Cubase songs; open TL	\$7,995
16-bit	N/A	No	N/A	N/A	N/N	Headphone out, ASIO 2.0 support	\$149
24-bit	N/A	No	N/A	N/A	N/N	Optional MI/ODI/O	\$400
N/A	N/A	No	N/A	N/A	N/N	Optional MI/ODI/O, mic input	\$TBA
24-bit	N/A	No	N/A	N/A	N/N	Headphone out	\$69
24-bit	N/A	No	N/A	N/A	N/N	Support game surround sound, Dolby digital/DTS pass thru, headphone, MIC, ASIO2.0	\$99
24-bit	N/A	No	N/A	N/A	N/N	Optional MI/ODI/O, ASIO 2.0, Dolby Digital, DTS pass thru	\$149
16-bit	N/A	No	N/A	N/A	N/N	AC3/DTS pass thru, headphone output, MIC in/Line in	\$99
16-bit	N/A	No	N/A	N/A	N/N	Headphone out, 8 x 24 bit DAC	\$139
24-bit	N/A	Yes	N/A	N/A	N/N	Optional board for Maya 44 mkII, Inca99 mkII and Prodigy192, 16 channel MIDI	\$99
16-bit	N/A	Yes	64/999	Unlimited	N/Y	OMF import, 5.1 surround mixing, automated mixdown	\$399
N/A	N/A	Yes	N/A	N/A	Y/Y	ASIO, ASIO 2, Wave GSIF, Direct Sound, Wave, MME, hardware comes w/mixers, effects	\$425
N/A	N/A	Yes	N/A	N/A	Y/Y	Same specs as Luna II with addition of 1 Z-Link and 2 ADAT I/O expansion plate	\$595
N/A	N/A	Yes	N/A	N/A	Y/Y	STS samplers	\$595
N/A	N/A	Yes	N/A	N/A	Y/Y	Same specs as Power Sampler II but includes additional I/O expansion plate w/1 Z link and 2 ADAT I/O	\$745
N/A	ADAT/MTC	Yes	N/A	N/A	Y/Y	ASIO, ASIO 2, GSIF, WAVE, Direct Sound, MME incl effects, mixers, synths, and sampling software	\$995
N/A	ADAT/MTC	Yes	N/A	N/A	Y/Y	ASIO, ASIO 2, GSIF, WAVE, Direct Sound drivers, MME incl effects, mixers, synths, sampling software	\$1,995
32-bit	ADAT, word clock, MTC, MIDI clock	Yes	128	N/A	Y/Y	ASIO, ASIO 2, GSIF, WAVE, Direct Sound, MME drives, various software, MiniMax, Modulator III, Vector	\$2,995
N/A	ADAT/MTC	Yes	N/A	N/A	Y/Y	ASIO, ASIO 2, GSIF, WAVE, Direct Sound drivers, MME	\$1,995
N/A	ADAT/MTC	Yes	N/A	N/A	Y/Y	ASIO, ASIO 2, GSIF, WAVE, Direct Sound, MME incl effects, mixers, synths, and sampling software	\$1,995
N/A	ADAT/MTC	Yes	N/A	N/A	Y/Y	ASIO, ASIO 2, GSIF, WAVE, Direct Sound, MME incl effects, mixers, synths, and sampling software	\$1,995
N/A	ADAT/MTC	Yes	N/A	N/A	Y/Y	ASIO, ASIO 2, GSIF, WAVE, Direct Sound drivers, MME	\$995
N/A	ADAT/MTC	Yes	N/A	N/A	Y/Y	ASIO, ASIO 2, GSIF, WAVE, Direct Sound, MME incl effects, mixers, synths, and sampling software	\$995
N/A	ADAT/MTC	Yes	N/A	N/A	Y/Y	ASIO, ASIO 2, GSIF, WAVE, Direct Sound drivers, MME incl effects, mixers, synths, sampling software	\$995
32-bit	ADAT/word clock/MTC/MIDI clock	Yes	128	N/A	Y/Y	ASIO, ASIO 2, GSIF, WAVE, Direct Sound drivers, MME incl effects, mixers, synths, sampling software	\$2,995
32-bit	ADAT/word clock/MTC/MIDI clock	Yes	128	N/A	Y/Y	ASIO, ASIO 2, GSIF, WAVE, Direct Sound, MME incl effects, mixers, synths, and sampling software	\$2,995

Computer-Based Digital Audio Workstations

Manufacturer	Product	Analog I/O	Digital I/O	Platform Version	Bus Type	Plug-In Format(s) Supported	Sample Rate	A/D/A Converter/Bit Rate
CreamWare	Scope/SP Plus	XLR in/out	AES-EBU	Win, MAC 9.2.2	PCI/DSP	Proprietary	32, 44.1, 48, 96 kHz	24-bit
Creative Labs	Sound Blaster Live	1/8" mic/line	S/PDIF	Win 95/98/NT	PCI	EAX	8-48 kHz	16-bit
Creative Labs	Sound Blaster Audigy 2 Platinum eX	In: (1) MIDI, (2) 1/4", (2) RCA, out: (1) 1/4", (1) MIDI	S/PDIF (coax and optical)	Win 98SE/ME/2000/XP	PCI	DirectX, EAX, EAX Advanced HD, ASIO2, VST	8-192 kHz	24-bit
Creative Labs	Sound Blaster Audigy 2 ZS Platinum Pro	In: (1) MIDI, (2) 1/4", (2) RCA, out: (1) 1/4", (1) MIDI	S/PDIF (coax and optical)	Win 98SE/ME/2000/XP	PCI	DirectX, EAX, EAX Advanced HD, ASIO2, VST	8-192 kHz	24-bit
Digidesign	Digi 002	(8/8) XLR, 1/4"	(8) ADAT optical, (2) S/PDIF	Win, Mac	FireWire	RTAS, AudioSuite	44.1-96 kHz	24-bit
Digidesign	Digi 002 Rack	(8/8) XLR, 1/4"	(8) ADAT optical, (2) S/PDIF	Win, Mac	FireWire	RTAS, AudioSuite	44.1-96 kHz	24-bit
Digidesign	Mbox	(2) XLR-1/4"	(2) S/PDIF	Win, Mac	USB	RTAS, AudioSuite	44.1-96 kHz	24-bit
Digidesign	Pro Tools HD 1, 2 Accel & 3 Accel	(Up to 96 channels)	(Up to 96 channels)	Win, Mac	PCI	TDM, HTDM, RTAS, AudioSuite	44.1-192 kHz	24-bit
Digigram	VX222	(2/2) XLR	(2/2) S/PDIF, AES/EBU	Win, Mac, Linux	PCI	N/A	8-48 kHz	24-bit
Digigram	VXpocket 440	(4/4) XLR	(2/2) S/PDIF (coax)	Win, Mac, Linux	PC card	N/A	8-48 kHz	24-bit
Digigram	VXpocket v2	(2/2) XLR	(2/2) S/PDIF (coax)	Win, Mac, Linux	PC card	N/A	8-48 kHz	24-bit
Digigram	VX442	(4/4) XLR	(2/2) S/PDIF, AES/EBU	Win, Mac	PCI	N/A	8-96 kHz	24-bit
Digital Audio Labs	CardDeluxe	(2/2) 1/4" TRS	S/PDIF	Win	PCI	Active Movie, DirectX	8-96 kHz	24-bit/128x/64x
Digital Audio Labs	PD-8, 8 Channel AES/EBU IF	0/2	(8) I/O	Win	PCI	N/A	44.1-96 kHz	24-bit
Digital Audio Labs	TDIF 2496 Pro	N/A	(16) I/O	Win	PCI	N/A	96 kHz	N/A
Echo Digital Audio	MiaMIDI	(2/2) balanced 1/4"	(2/2) S/PDIF (coaxial)	Win 95/98/ME/2000/XP, Mac OS 8/9/X	PCI	N/A	32-96 kHz	24-bit
Echo Digital Audio	Gina24	(2/8) balanced 1/4"	(8/8) ADAT, (2/2) SPDIF (optical & coaxial)	Win 95/98/ME/2000/XP, Mac OS 8/9/X	PCI	N/A	8-96 kHz	24-bit
Echo Digital Audio	Layla24	(8/8) balanced 1/4"	(8/8) ADAT, (2/2) S/PDIF (optical & coaxial)	Win 95/98/ME/2000/XP, Mac OS 8/9/X	PCI	N/A	8-96 kHz	24-bit
Echo Digital Audio	Layla Laptop	(8/8) balanced 1/4"	(8/8) ADAT, (2/2) SPDIF (optical & coaxial)	Win 95/98/ME/2000/XP, Mac OS 8/9/X	Type II Cardbus	N/A	8-96 kHz	24-bit
Echo Digital Audio	Indigo	(0/2) stereo 1/8"	N/A	Win ME/2000/XP, Mac OS X	Type II Cardbus	N/A	32-96 kHz	24-bit
Echo Digital Audio	Indigo io	(2/2) stereo 1/8"	N/A	Win ME/2000/XP, Mac OS X	Type II Cardbus	N/A	32-96 kHz	24-bit
Echo Digital Audio	Indigo dj	(0/4) stereo 1/8"	N/A	Win ME/2000/XP, Mac OS X	Type II Cardbus	N/A	32-96 kHz	24-bit
Edirol	DA-2496 Audio Interface	8 in: (2) XLR/TRS combo, (6) TRS, 8 out: TRS	S/PDIF (optical, coaxial)	Win, Mac	PCI	N/A	8-96 kHz	24-bit
Edirol	M-100 FX	(10/2) (2) XLR, (4) 1/4, (4) RCA	S/PDIF out, USB out	Win, Mac	USB	DirectX, VST	44.1 kHz	24-bit
Edirol	UA-1X USB Audio Interface	RCA stereo, headphone	Optical S/PDIF	Win, Mac	USB	N/A	32, 44.1, 48 kHz	N/A
Edirol	UA-3FX	RCA, 1/4" mic/guitar, 1/8" mic In: RCA out	S/PDIF (optical)	Win, Mac	USB	N/A	32, 44.1, 48 kHz	24-bit
Edirol	UA-5 USB	In: (2) XLR/TRS Combo, RCA, out: RCA, 1/4", headphone	S/PDIF (optical, coax)	Win, Mac	USB	DirectX, ASIO2	44.1, 48, 96 kHz	24-bit
Edirol	UA-20 USB	(2) 1/4"/RCA, headphone out	S/PDIF optical out	Win, Mac	USB	DirectX, VST	44.1 kHz	24-bit
Edirol	UA-700 USB	(2) XLR/TRS, (1) 1/4", RCA In: 1/4", RCA, headphone out	S/PDIF (optical, coaxial)	Win, Mac	USB	DirectX, VST	32, 44.1, 48 kHz	24-bit
Edirol	UA-1000	(4) XLR/TRS combo in, 8 TRS balanced in, 8 TRS balanced out, headphone out	ADAT, S/PDIF	Win XP	USB	DXi, VST	up to 96 kHz	24-bit
Edirol	UR-80	XLR/TRS combo in, RCA out, headphone	S/PDIF optical & coaxial	Win, Mac	USB	VST, DXi, AU	up to 96 kHz	24-bit
ESI	AQUA U24M	(4/4) RCA, (2) XLR in	(2) S/PDIF Coax in, (2) S/PDIF Coax out	Win, Mac	USB	N/A	96 kHz	24-bit
ESI	MaXio	(8/8) XLR	AES/EBU, S/PDIF	Win, Mac	PCI	N/A	192 kHz	24-bit

Digital Recorder Resolutions (max)	Sync Types	MIDI Control	Tracks/Virtual Tracks	# of Locate Points	Effects/Dynamic Processing	Additional Features	List Price
N/A	ADAT/word clock/MTC/MIDI clock	Yes	128	N/A	Y/Y	ASIO, ASIO 2, GSIF, WAVE, Direct Sound drivers, MME	\$2,995
16-bit	MIDI	No	N/A	N/A	Y/Y	Includes Cakewalk, Sound Forge, Mixman software and digital I/O card	\$199
16/24-bit	MIDI	Yes	64	N/A	Y/Y	106dB SNR	\$250
16/24-bit	MIDI	Yes	64	N/A	Y/Y	108 dB SNR	\$250
24-bit	ADAT, S/PDIF	Yes	32/0	Unlimited	Y/Y	Pro Tools LE software, integrated control surface, four mic pres, MIDI I/O, 48V, Standalone mode	\$2,495
24-bit	ADAT, S/PDIF	Yes	32/0	Unlimited	Y/Y	Pro Tools LE software, integrated control surface, four mic pres, MIDI I/O, 48V phantom	\$1,295
24-bit	N/A	Yes	32/0	Unlimited	Y/Y	Pro Tools LE software, Focusrite pres, 48V phantom, headphone jacks, near zero-latency monitoring	\$495
24-bit	LTC, VITC, MTC, BiPhase, Pilot Tone, AES/EBU, S/PDIF, ADAT	Yes	192/0	Unlimited	Y/Y	Pro Tools TDM software, HD interfaces & peripherals, control surfaces, Digi & Dev Partner plug-ins	\$7,995 and up
24-bit	N/A	No	N/A	N/A	N/Y		\$549
24-bit	SMPTE, LTC	No	N/A	N/A	N/N		\$659
24-bit	SMPTE, LTC	No	N/A	N/A	N/N		\$509
24-bit		No	N/A	N/A	N/N	On-board routing and console	\$789
24-bit	Internal, ext. digital	No	N/A	N/A	N/N	Multiple card support	\$399
24-bit	Ultra word clock, AES/EBU, internal	No	N/A	N/A	N/A		\$799
24-bit	Word clock, internal	No	N/A	2	Y/Y	Dual TDIF, DTRS sync port, multiscard support	\$699
24-bit	S/PDIF	Yes	N/A	N/A	N/N	MIDI I/O, 8 virtual outputs, low latency drivers with full support for OS X, WDM, Gigastudio	\$249
24-bit	S/PDIF, ADAT, Esync	No	N/A	N/A	N/N	Headphone output, low latency, full support for OS X, WDM, ASIO & Gigastudio, Purewave, Superchannel	\$495
24-bit	Word clock, MTC, S/PDIF, ADAT, Esync	Yes	N/A	N/A	N/N	Headphone output, low-latency, full support for OS X, WDM, ASIO & Gigastudio, Purewave, Superchannel	\$995
24-bit	Word clock, MTC, SPDIF, ADAT, Esync	Yes	N/A	N/A	N/N	Headphone output, low latency, full support for OS X, WDM, ASIO & Gigastudio, Purewave, Superchannel	\$995
24-bit	N/A	No	N/A	N/A	N/N	8 virtual outputs, headphone out, low-latency, full support for OS X, WDM, ASIO & Gigastudio	\$159
24-bit	N/A	No	N/A	N/A	N/N	9 virtual outputs, headphone out, low latency, full support for OS X, WDM, ASIO & Gigastudio	\$229
24-bit	N/A	No	N/A	N/A	N/N	8 virtual outputs, headphone & line out, low-latency, full support for OS X, WDM, ASIO & Gigastudio	\$229
24-bit	Word clock	No	8/8	N/A	N/N	Phantom power, 24 db pad, 8 in/out gain controls, 8 peak indicators, WDM & ASIO drivers	\$750
24-bit	N/A	No	N/A	N/A	Y/Y	Aux send, return	\$495
16-bit	N/A	No	2 mono/1 stereo	N/A	N/N	USB powered, gain switch, volume control	\$95
24-bit	N/A	No	2 mono/1 stereo	N/A	Y/Y	Powerful set of effects	\$215
24-bit	N/A	No	2 mono/1 stereo	N/A	N/N	Phantom power, in/out gain controls, peak indicators, WDM and ASIO drivers	\$355
24-bit	N/A	No	2 mono/1 stereo	N/A	N/N	ASIO, WDM support, direct monitoring, MIDI I/O, FPT technology	\$215
24-bit	N/A	Yes	2 mono/1 stereo	N/A	Y/Y	Line/mic/guitar input, COSM guitar amp & microphone modeling, phono preamp	\$595
24-bit	ADAT, word clock	Yes	10	N/A	N/N	Inserts on channels 1-4	\$945
24-bit	MTC	Yes	2/dynamic	Dynamic	N/N	Includes Control Assignment software & HQ HyperCanvas Software synth	\$545
24-bit	N/A	Yes	N/A	N/A	N/N	+48V phantom power, 2x2 MIDI I/O	\$400
24-bit	Word clock	No	N/A	N/A	N/N	PCI card can handle 4 expanders for 128 tracks total	\$2,000

Computer-Based Digital Audio Workstations

Manufacturer	Product	Analog I/O	Digital I/O	Platform Version	Bus Type	Plug-In Formats Supported	Sample Rate	A/D/A Converter/Bit Rate
ESI	WaMi Rack 192L	(4) XLR in/(8) 1/4" out with (2) XLR out	S/PDIF	Win, Mac	PCI	N/A	96 kHz in, 192 kHz out	24-bit
ESI	WaMi Rack 192X	(4) XLR in/(8) 1/4" out with (2) XLR out	S/PDIF	Win, Mac	PCI	N/A	192 kHz	24-bit
ESI	Waveterminal 192L	(2/6) 1/4"	S/PDIF	Win, Mac	PCI	N/A	96 kHz in, 192 kHz out	24-bit
ESI	Waveterminal 192M	(4/8) 1/4"	S/PDIF (optical, coaxial)	Win, Mac	PCI	N/A	96 kHz in, 192 kHz out	24-bit
ESI	Waveterminal 192X	(2/6) 1/4"	S/PDIF	Win, Mac	PCI	N/A	192 kHz	24-bit
ESI	Waveterminal U24	(2/2) 1/4"	(2/2) S/PDIF (coaxial, optical)	Win, Mac	USB	N/A	32, 44.1, 48 kHz	24-bit
ESI	GIGAPort AG	(0/8) RCA	2 out, optical	Win, Mac	USB	N/A	16 kHz	N/A
ESI	GIGAPort DG	N/A	(8) ADAT	Win, Mac	USB	N/A	44, 48 kHz	N/A
ESI	QUATA Fire	(4/4) RCA	(2/2) coaxial	Win, Mac	IEEE1394 (FireWire)	N/A	192 kHz	24-bit
ESI	OCTA-Fire	(8/8) 1/4"	(2/2) coaxial	Win, MAC	IEEE1394	N/A	192 kHz	24-bit
ESI	HEXA-Fire	N/A	(16) AES/EBU, (2/2) coaxial & AES/EBU	Win, Mac	IEEE1394 (FireWire)	N/A	192 kHz	24-bit
ESI	Audioterminal 010	N/A	(1) ADAT Tos-Link I/O (8 channels), (1) TDIF/R-BUS I/O (DSUB25p)	Win	PCI	N/A	48, 96 kHz	N/A
ESI	MI/ODI/O	N/A	(1) optical in, (1) coaxial I/O (192kHz)	N/A	N/A	N/A	192 kHz	N/A
Emagic	EMI 2/6	(2/6) RCA	(2/2) S/PDIF (coaxial)	Win, Mac	USB	DirectX, VST	44.1, 48 kHz	24-bit
Emagic	EMI 6/2M	(6/2) RCA	S/PDIF	Win 98SE/ME/XP, Mac OS X	USB	DirectX, VST, AU	44.1, 48, 88.2, 96 kHz	24-bit
Event Electronics	EZ8	N/A	(8/8) ADAT	Win 95/98/ME/XP	PCI	N/A	44.1, 48, 88.2, 96 kHz	N/A
Event Electronics	EZbus	(2) mic, (20) line, (2) instrument	(8) ADAT, (2) S/PDIF, (1) USB	Win, Mac	USB	N/A	44.1 or 48 kHz	24-bit
Frontier Design Group	Dakota	N/A	(16/16) ADAT, (2/2) S/PDIF (optical, coax)	Win 95/98/ME/2000/XP, Mac	PCI	N/A	44.1 or 48 kHz	N/A
Frontier Design Group	WaveCenter/PCI	N/A	(8/8) ADAT, (2/2) S/PDIF (coax., optical)	Win 95/98/ME/2000/XP, Mac	PCI	N/A	44.1 or 48 kHz	N/A
Lynx Studio Technology	Lynx L22	(2/2) XLR	(2/2) S/PDIF or AES/EBU	Win 98/ME/NT/2000/XP, Mac	PCI	N/A	8-200 kHz a, 32-96 kHz d	24-bit
Lynx Studio Technology	Lynx ONE	(2/2) XLR	(2/2) S/PDIF or AES/EBU	Win 95/98/NT/2000, Mac, Linux	PCI	N/A	8-48 kHz (analog), 32-96 kHz (digital)	24-bit
Lynx Studio Technology	Lynx TWO	(4/4), (2/6), (6/2) XLR	(2/2) S/PDIF or AES/EBU	Win 95/98/NT/2000, Mac, Linux	PCI	N/A	8-192 kHz (analog), 32-96 kHz (digital)	24-bit
Lynx Studio Technology	AES16	N/A	(16/16) S/PDIF or AES/EBU	Win 2000/XP, Mac OS X	PCI	N/A	up to 192 kHz	24-bit
M-Audio	Audiophile 2496	(2/2) RCA	S/PDIF (coaxial)	Win 95/98/2000, Mac, Linux	PCI	Direct X, VST	8-96 kHz	24-bit/128x
M-Audio	Audiophile USB	(2/2) RCA out, RCA, 1/4" in	(2/2) coax S/PDIF	Win 98SE/ME/2000/XP, Mac OS 9 x-X	USB	VST, Dxi, ASIO, EASI, WDM	44.1, 48, 96 kHz	24-bit
M-Audio	Audiosport Quattro	(4/4) 1/4" TRS	N/A	Win ME/2000, ASIO 1/2	USB	Direct X, VST	44.1, 48, 96 kHz	24-bit/128x
M-Audio	Delta 1010	(8/8) 1/4" TRS	(2/2) S/PDIF (coax)	Win 95/98/SE/NT/2000/ME/XP, Mac OS 8.6-X	PCI	VST, GSIF, DXi, ASIO, EASI, WDM	8-96 kHz	24-bit
M-Audio	Delta 1010 LT	(8/8)	(2) S/PDIF	Win 95/98/SE/NT/2000/ME/XP, Mac OS 8.6-X	PCI	VST, DXi, GSIF, ASIO, WDM, RA	8-96 kHz	24-bit
M-Audio	Delta Audiophile 2496	(2/2) RCA	(2/2) S/PDIF (coax)	Win 95/98/SE/NT/2000/ME/XP, Mac OS 8.6-X	PCI	VST, GSIF, DXi, ASIO, EASI, WDM	8-96 kHz	24-bit
M-Audio	Duo USB	(2/2) XLR, 1/4" TRS	S/PDIF coax out	Win 98SE/ME/2000/XP, OS 9 x-X	USB	VST, Dxi, ASIO, EASI, WDM	44.1, 48, 96 kHz	24-bit
M-Audio	FireWire 410	2/8	(2/2)	Win 2000/XP, Mac OS 9 and OS X	FireWire	ASIO, GSIF, WDM	96 kHz	24-bit
M-Audio	Omni Studio	(4/4) 1/4" TRS	(2/2) S/PDIF (coax)	Win 95/98/2000/NT/XP, Mac, Linux	PCI	Direct X, VST	8-96 kHz	24-bit/128x
M-Audio	Omni Studio USB	(4/4) XLR, 1/4" TRS in, 1/4" TRS out	N/A	Win 98SE/ME/2000/XP, Mac OS 9 x-X	USB	VST, Dxi, ASIO, EASI, WDM	44.1, 48, 96 kHz	24-bit

Digital Recorder Resolutions (max)	Sync Types	MIDI Control	Tracks/Virtual Tracks	# of Locate Points	Effects/Dynamic Processing	Additional Features	List Price
24-bit	N/A	Yes	N/A	N/A	N/N	ADC: 100dB, DAC 104dB, 4MIC preamps with phantom power	\$499
24-bit	N/A	Yes	N/A	N/A	N/N	ADC 123dB, DAC 106dB, 4MIC preamps with phantom power	\$749
24-bit	N/A	No	N/A	N/A	N/N	24/96 digital out, optional add on card MI/ODI/O	\$199
24-bit	N/A	No	N/A	N/A	N/N	Two mic inputs, optional add-on card MI/ODI/O	\$250
24-bit	N/A	No	N/A	N/A	N/N	24/96kHz digital out, optional add on card MI/ODI/O	\$279
16/24-bit	S/PDIF	No	N/A	N/A	N/N	4 ch full duplex in and out (analog and digital)	\$299
N/A	N/A	No	N/A	N/A	N/N	24-bit DAC, headphone out, supports ASIO driver	\$199
16-bit	N/A	No	N/A	N/A	N/N	ASIO 2.0 support	\$199
24-bit	N/A	Yes	N/A	N/A	N/N	2 mic preamps with +48V phantom power, cascade up to 4 units, 32 channel MIDI	\$500
24-bit	N/A	Yes	N/A	N/A	N/N	4 mic preamps with +48V phantom power, 64 channels MIDI, cascade up to 4 units.	\$700
24-bit	SMPTE, word clock, video sync	Yes	N/A	N/A	N/N	8 mic preamps with +48V phantom power, cascade up to 4 units, 16 channels MIDI	\$1,000
24-bit	Word clock I/O, MTC, MMC	No	N/A	N/A	N/N	Additional coaxial I/O, 16 channel MIDI	\$399
24-bit	N/A	Yes	N/A	N/A	N/N	Optional board for WT192 series (X,L,M), 16 channel MIDI	\$99
24-bit	Word clock	No	Software dependent	N/A	N/N	N/A	\$399
24-bit	Word clock	No	Software dependent	N/A	N/N	Zero latency monitoring, integrated MIDI interface, low latency OSX driver	\$399
24-bit	N/A	No	8/0	N/A	N/N	Optical audio interface, S/MUX mode for 4-ch 24-bit/96kHz operation, monitoring, sample-rate select control panel for levels,	\$199
N/A	ADAT, word clock	Yes	N/A	8	Y/Y	Fully programmable control surface, stand-alone digital mixer, programmable audio routing matrix	\$749
24-bit	ADAT sync, MTC, SoDA (SMPTE on digital audio),	No	N/A	N/A	N/N	ASIO 2.0, GigaStudio drivers, MIDI/I/O (8x8 optional), expandable to 32 ADAT channels	\$449
24-bit	MTC	No	N/A	N/A	N/N	2x2 MIDI I/O, ASIO 2.0 and GigaSampler drivers	\$329
24-bit	AES/EBU, word clock, super clock	No	32/unlimited	N/A	N/N	L-Stream modules, 6-foot XLR audio cable, 2-foot sync cable, multichannel ADAT and AES/EBU expansion	\$749
24-bit	AES/EBU, word clock, super clock	Yes	N/A	N/A	N/N	XLR audio and MIDI/clock I/O cables included	\$499
24-bit	AES/EBU, word clock, super-lock, SMPTE, composite video	No	N/A	N/A	N/N	6-foot XLR audio cable, 2-foot sync cable, Multichannel ADAT and AES/EBU expansion cards	\$1,095
24-bit	Word clock, multiscard	No	NA	N/A	N/N	6 Foot XLR cables with AES16-XLR and -SRC models, sample rate conversion on AES16-SRC	\$795
24-bit	Multiscard sync	Yes	N/A	N/A	N/N	On-board digital mixing, routing and monitor controls, SCMS, ASIO 1/2, EASI, GSIF, DirectX	\$230
24-bit/128x	N/A	Yes	N/A	N/A	N/N	Headphone output (1/4" TRS) w/volume control	\$250
24-bit	N/A	No	N/A	N/A	N/N	Hardware monitoring, ASIO 1/2, Mac and Win support	\$350
24	Word clock, S/PDIF, internal	Yes	N/A	N/A	N/N	MIDI	\$800
24	S/PDIF, internal	Yes	N/A	N/A	N/N	MIDI, 2 built-in mic preamps	\$500
24-bit	S/PDIF, internal	Yes	N/A	N/A	N/N	MIDI	\$230
24-bit/128x	N/A	No	N/A	N/A	N/N	2 mic preamps w/phantom power	\$350
24-bit	S/PDIF (coaxial/optical), MTC, and MIDI clock	Yes	N/A	N/A	N/N		\$500
24-bit	Multiscard sync	No	N/A	N/A	N/N	Split console design, 2 mic pres have inserts, 2 line inputs, 4 stereo aux inputs, effects send, monitor outs, 4 direct outs, stereo record outs, 2 headphone outs	\$600
24-bit/128x	N/A	Yes	N/A	N/A	N/N		\$599

Computer-Based Digital Audio Workstations

Manufacturer	Product	Analog I/O	Digital I/O	Platform Version	Bus Type	Plug-In Formats Supported	Sample Rate	A/D/A Converter/Bit Rate
Mackie	UAD-1 DSP	N/A	N/A	Win, Mac	PCI	N/A	32-192 kHz	24-bit
Mackie	Spike Powered Recording System	2 mic/inst in	S/PDIF, MIDI	Win, Mac	USB	VST	96 kHz	24-bit
Marian	Marc 2 Pro	Stereo balanced XLR	AES/EBU on XLR, S/PDIF coax and Toslink	Win, Mac	PCI	N/A	96 kHz	24-bit
Marian	Marc-X	Stereo	ADAT and S/PDIF	Win, Mac	PCI	N/A	96 kHz	24-bit
Marian	Marc 4 MIDI	4/4	N/A	Win, Mac	PCI	N/A	96 kHz	24-bit
Marian	Marc A	N/A	ADAT	Win, Mac	PCI	N/A	48 kHz	24-bit
Marian	Marc 2	Stereo	Stereo S/PDIF	Win, Mac	PCI	N/A	96 kHz	24-bit
Marian	Marc 4 Digi	(4) 1/4" TRS	Stereo S/PDIF	Win, Mac	PCI	N/A	96 kHz	24-bit
Marian	Marc 8 MIDI	(8) RCA	N/A	Win, Mac	PCI	N/A	96 kHz	24-bit
Merging Technologies	PyraMix Virtual Studio 4.1	Optional external 24 bit/96 kHz	ADAT, S/PDIF, MADI, AES/EBU, TDIF, SDIF	Win 2000 Pro/XP Pro	PCI	Native, DirectX, VST	32 kHz, DSD 384	24-bit
Micro Technology	MicroSound/Krystal	2/2	AES/EBU, S/PDIF	Win	PCI	DirectX	8-48 kHz	16-bit
MOTU	24i	(24/2) 1/4" TRS	S/PDIF (RCA and Toslink) out	Win, Mac, ASIO, GSIF	PCI	All native	44.1, 48 kHz	24-bit
MOTU	308	N/A	(8) AES/EBU, 8 S/PDIF (coax)/ (8) S/PDIF (optical)	Win, Mac, ASIO, GSIF	PCI	All native	44.1, 48 kHz	24-bit
MOTU	828	(8/8) 1/4" TRS (2) XLR-1/4" combo	(2/2) S/PDIF (optical) or (8/8) ADAT	Win, Mac	FireWire (IEEE 1394)	All native	44.1, 48 kHz	24-bit
MOTU	896	(8/8) XLR-1/4" combo	(2/2) AES/EBU, (8/8) ADAT	Win ME/2000/XP, Mac OS 9	FireWire (IEEE 1394)	All native	44.1, 48, 88.2, 96 kHz	24-bit
MOTU	1224	(8/10) 1/4" TRS	AES/EBU	Win, Mac	PCI	All native	44.1, 48 kHz	24-bit
MOTU	1296	(12) XLR	AES/EBU	Win, Mac	PCI	All native	44.1, 48, 88.2, 96 kHz	24-bit
MOTU	2408mkII	(8/8) 1/4" TRS	S/PDIF, (3) ADAT Lightpipe, (3) TDIF	Win, Mac	PCI	All native	44.1, 48 kHz	24-bit
Mytek Digital	DAW 9624	(8/8) XLR (expandable)	(4) AES/EBU, ADAT (optional TDIF)	Win 95/NT, Mac BeOS, Linux	PCI	VST, DirectX	44.1, 48, 88.2, 96 kHz	24-bit
PreSonus	Fire Station	(8/8) TRS (2 mic/inst. in)	ADAT, S/PDIF, MLAN, IEEE 1394	Win XP, Mac 9.x	FireWire (IEEE 1394)	N/A	32, 44.1, 48 kHz	24-bit
RME	Digi 96/8	N/A	ADAT, S/PDIF, AES/EBU	Win 98/ME/2000, Mac	PCI	VST, DirectX	32, 44.1, 48, 64, 88.2, 96 kHz	N/A
RME	Digi 96/8 Pad	1/4" stereo	ADAT, S/PDIF, AES/EBU	Win 98/ME/2000/XP, Mac	PCI	VST, DirectX, ASIO	32, 44.1, 48, 64, 88.2, 96 kHz	24-bit
RME	Digi 96/8 PST	1/4" stereo	ADAT, S/PDIF, AES/EBU	Win 98/ME/2000/XP, Mac	PCI	VST, DirectX	32, 44.1, 48, 64, 88.2, 96 kHz	24-bit
RME	Hammerfall 96/36	N/A	(2) ADAT, S/PDIF, AES/EBU	Win 98x/ME/2000/XP, Mac	PCI	VST, DirectX	32, 44.1, 48, 64, 88.2, 96 kHz	24-bit
RME	HDSP MADI	N/A	MADI (optical, coax)	Win	PCI	DirectX, VST	96 kHz	N/A
RME	HDSP 9632	Bal stereo XLR in/ headphone out	S/PDIF, AES/EBU, ADAT	Win, Mac	PCI	DirectX, VST	N/A	24-bit
RME	Hammerfall 96/52	N/A	(3) ADAT, S/PDIF, AES/EBU	Win 98/ME/2000/XP, Mac	PCI	VST, DirectX	32, 44.1, 48, 64, 88.2, 96 kHz	24-bit
RME	Hammerfall Digiface	1/4" TRS stereo line out, headphone out	(3) ADAT, S/PDIF	Win 98/ME/2000/XP, Mac	PCI/PCM CIA	VST, DirectX	32, 44.1, 48, 64, 88.2, 96 kHz	24-bit
RME	Hammerfall Multiface	(8) 1/4" TRS line	ADAT, S/PDIF	Win 98/ME/2000/XP, Mac	PCI/PCM CIA	VST, DirectX	32, 44.1, 48, 64, 88.2, 96 kHz	24-bit
Roland	Studio Package Pro (RPC-SI24)	(8) XLR/line in, gtr in, (6) analog out, headphone out	Coax, 8 ch 24/96	Win, Mac	PCI	VST	96 kHz	24-bit/
Roland	RPC-SI-24W (Sonar)	(8) XLR/TRS	(2) S/PDIF	Win	PCI	VST	96 kHz	24-bit
Roland	VS-2400CD	(8) XLR/TRS	(2) coax, (2) optical, (8) RBUS	Standalone	N/A	N/A	96 kHz	24-bit
SADiE, Inc.	PCM8	8, scalable to 32	8, scalable to 32	Win XP	Full turnkey system	DirectX, proprietary Cedar Restoration plug-ins	192 kHz	24-bit

Digital Recorder Resolutions (max)	Sync Inputs	MIDI Control	Tracks/Virtual Tracks	# of Locate Points	Effects/Dynamic Processing	Additional Features	List Price
24-bit	N/A	No	N/A	N/A	Y/Y	UAD-1 Powered Plug-Ins Card, RealVerb Pro, UA 1176LN, Nigel Guitar Processor, CS-1 Channel Strip	\$999
24-bit	N/A	Yes	Unlimited	Unlimited	Y/Y	Compact, easy-to-use recording system including all software necessary to track, mix, and record	\$419
N/A	MIDI, word clock	No	N/A	N/A	N/N	Samplitude Bundle Software	\$699
N/A	MIDI, word clock	No	N/A	N/A	Y/Y	Full digital DSP Mixer	\$499
24-bit	MIDI	No	N/A	N/A	N/N	2 x MIDI in/out, Samplitude Software	\$369
N/A	N/A	No	N/A	N/A	N/N	Samplitude Bundle Software	\$249
N/A	N/A	No	N/A	N/A	N/N	Samplitude Bundle Software	\$299
N/A	N/A	No	N/A	N/A	N/N	Samplitude Bundle Software	\$369
N/A	MIDI	No	N/A	N/A	N/N	2 x MIDI I/O, Samplitude Bundle Software	\$499
PCM 32-bit, DSD 1-bit	SMPTE, VITC, MTC, word clock, RS422, PAL, NTSC, HDV	Yes	Unlimited	Unlimited	Y/Y	Cross-fade editor, multi-point source/master editing, DSD, supports PMF, SDII, AIFF, AVI, MPS, WAV, BWF, OMF	\$2,495 and up
24-bit	Video black burst, SMPTE (all, optional)	No	Unlimited	32,767	Y/Y	Can edit and mix CD-ROM master files	\$3,995
24-bit	Internal, word clock (in/out), ADAT sync (in)	No	Host dependent	Host dependent	Host dependent	111 dB S/N A-weighted, accepts -10 dB input with software boost, front-panel headphone	\$1,195–\$1,495
24-bit	Internal, word clock, AES/EBU, S/PDIF, Toslink	No	Host dependent	Host dependent	Host dependent	Standalone format conversion of up to 8 ch at a time	\$695
24-bit	ADAT sync (sample-accurate, lightpipe)	No	Host dependent	N/A	Host dependent	CueMix Plus no-latency monitoring, 2 mic inputs with mic preamps, front-panel trims, main out volume knob	\$795
24 bit	ADAT, word clock, optical	No	Host dependent	Host dependent	Host dependent	Expandable to 72 channels	\$1,295
24 bit	Word clock, ADAT sync, AES/EBU	No	Host dependent	Host dependent	Host dependent	XLR main outs, cue-mix notation monitors	\$1,295
24 bit	Internal, word clock, AES/EBU, independent AES word in	No	Host dependent	Host dependent	Y/Y	116 dB S/N A-weighted on inputs and XLR main outs, front-panel headphone control	\$1,795–\$2,095
24 bit	Word clock, lightpipe, ADAT, DTP	No	Host dependent	Host dependent	Host dependent	117 dB S/N A-weighted, supports 5.1 surround I/O, AES/EBU I/O rate converters	\$695–\$995
32-bit, dep. on 3rd-party swtwr	Word clock, video, (SMPTE w/extra hardware)	Yes	8 (expandable)/64	N/A	Optional	Works as standalone format converter, sample-accurate ADAT/Tascam transfers	\$6,495
24-bit	ADAT, BNC, internal, IEEE 1394	No	N/A	N/A	N/N	Various format DIO cards for 8x96	\$1,000
24 bit	N/A	No	8 channel	N/A	N/N	Digichek software	\$395
24 bit	N/A	No	8 channel	N/A	N/N	Digichek software	\$635
24 bit	N/A	No	8 channel	N/A	N/N	Digichek software	\$570
24 bit	ADAT	No	18 channel	N/A	N/N	Digichek software	\$575
24 bit	LTC, MIDI	Yes	N/A	N/A	N/N	Word clock I/O, 64 ch	\$1,749
32 bit	N/A	Yes	N/A	N/A	N/N	Includes Digichek spectrum analyzer, 16 ch meter bridge, vectorscope-bit statistics	\$799
24 bit	ADAT, word clock	No	26 channel	N/A	N/N	Digichek software	\$699
24 bit	Word clock, ADAT	Yes	26 channel	N/A	N/N	(2) MIDI I/O, Digichek software, meter bridge	\$715
24 bit	Word clock, ADAT	Yes	18 channel	N/A	N/N	MIDI I/O, Digichek software, meter bridge	\$910
24 bit	MTC/MMC	Yes	24 audio/ unlimited MIDI	Unlimited	Y/Y	Also MIDI interface, motorized faders, joystick, surround, templates for Steinberg, HUI, User modes, knobs	\$1,495
24 bit	MTC, MMC	Yes	N/A		Y/Y	Comes with Sonar 2.2 Software	\$1,495
24 bit	MTC	Yes	24/384	1000	Y/Y	Vocoder, real-time analyzer, voice transformer	\$3,295
32 float	AES reference, LTC, video ref	No	32	Unlimited	Y/Y	Full Redbook Authoring, complete turnkey system	\$9,750 for 8 I/O

Computer-Based Digital Audio Workstations

Manufacturer	Product	Analog I/O	Digital I/O	Platform Version	Bus Type	Plug-In Formats Supported	Sample Rate	AD/DA Converter/Bt Rate
SADiE, Inc.	PCM4	4/4	4	Win XP	PCI Card	DirectX, proprietary Cedar Restoration plug-ins	96 kHz	24-bit
SADiE, Inc.	DSD2	2/2	2	Win XP	Full turnkey system	DirectX in PCM mode, proprietary in DSD mode	192 kHz	24-bit
SEK'D	ARC88	8/8	Toslink, S/PDIF	Win 95/98/NT, Mac	PCI	N/A	32, 44.1, 48 kHz	16-bit
SEK'D	Prodif-88	Stereo balanced out	(8/8) AES/EBU	Win	PCI	N/A	96 kHz	24-bit
SEK'D	Prodif-T	N/A	(16) TDIF	Win	PCI	N/A	97 kHz	24-bit
Sonic Studio	Sonic Studio HD 1.8	Optional	Optional	Mac	PCI	N/A	192 kHz	N/A
Sonus	Studi/O	Stereo monitor output	16 via 2x8 ADAT optical interfaces	Win 98/NT/2000, Mac, BeOS, Linux	PCI	N/A	44.1, 48, 88.2, 96 kHz	N/A
Sonus	USB Studio D	(2) mic, (2) instrument, (2) phono, (4) line in, (2) line out, phone out	(2) S/PDIF I/O	Win, Mac	USB	N/A	44.1, 48 kHz	20-bit/128x
Sound Devices, LLC	USBPre 1.5	2 mic/line with phantom power	S/PDIF	Mac OS 9, X, Win 98SE+	USB 1.1	N/A	48 kHz	24-bit
Steinberg	Nuendo 2.1	Open	Open	Win 2000/XP, Mac OS X	Open	VST, DirectX	Up to 192 kHz (dep. on hw/dwre)	24-bit (dep. on hw/dwre)
Steinberg	VSL2020 PCI Audio Card	Stereo unbal RCA	32 ADAT, S/PDIF, AES/EBU	Win 2000, XP, Mac OS X (beta)	PCI	VST	96 kHz	24-bit
Steinberg	96/52 HDSP PCI Card	N/A	(3) ADAT, S/PDIF, AES/EBU	Win 98/ME/2000/XP, Mac	PCI	VST, DirectX	32, 44.1, 48, 64, 88.2, 96 kHz	24-bit
Steinberg	Audiolink 96 Digiset I/O	1/4" TRS stereo line out, headphone out	(3) ADAT, S/PDIF	Win 98/ME/2000/XP, Mac	PCI/PCM CIA	VST, DirectX	32, 44.1, 48, 64, 88.2, 96 kHz	24-bit
Steinberg	Audiolink 96 Multiset I/O	(8) 1/4" TRS line	ADAT, S/PDIF	Win 98/ME/2000/XP, Mac	PCI/PCM CIA	VST, DirectX	32, 44.1, 48, 64, 88.2, 96 kHz	24-bit
Swissonic	USB Studio D	(2) mic, (2) instr., (4) line, (1) phono	Stereo S/PDIF coax and Toslink	Win, Mac	USB	N/A	48 kHz	20-bit
TC Electronic	PowerCore 1.7	N/A	N/A	Win XP w/Pentium III, Mac 10.2 or higher	PCI X2	VST, AU	96 kHz	24-bit
TC Electronic	PowerCore FireWire 1.7	N/A	N/A	Win XP w/Pentium III, Mac 10.2 or higher	FireWire	VST, AU	96 kHz	24-bit
Tascam	FW-1884	(8) balanced mic/line in, (8) balanced out	(8/8) ADAT, S/PDIF	Win, Mac	FireWire	N/A	44.1-96 kHz	24-bit
Tascam	PCI-822	N/A	(8) TDIF, S/PDIF	Win, Mac	PCI	N/A	44.1-48 kHz	16-, 20-, 24-bit
Tascam	US-122	(2) XLR, 1/4"/(2) 1/4"	N/A	Win, Mac	USB	N/A	44.1 kHz	24-bit
Tascam	US-224	(2) XLR, 1/4"/(2) 1/4"	S/PDIF	Win, Mac	USB	N/A	44.1 kHz	24-bit
Tascam	US-428	(2) XLR, (4) 1/4" out	S/PDIF	Win, Mac	USB	N/A	44.1 kHz	24-bit A/D/A
TerraTec	DMX 6fire	(7/2) 5.1 analog out	(4/4) S/PDIF (coax, optical)	Win 95/98/2000/NT/XP, Linux	PCI	N/A	32-96 kHz	24-bit
TerraTec	EWS-88D	Stereo out	ADAT, S/PDIF (coax, optical)	Win (all), Linux	PCI	N/A	32-96 kHz	24-bit/96 kHz
TerraTec	EWS-88MT AudioSystem	8/8	(2) S/PDIF	Win	PCI	DirectX	96 kHz	24-bit
TerraTec	EWX-24/96	(2/2) RCA	(2/2) S/PDIF (optical)	Win 95/98/2000/NT/XP, Linux	PCI	N/A	32-96 kHz	24-bit
TerraTec	MIC 2	(8/8) XLR-1/4" combo	ADAT, S/PDIF, AES/EBU	Mac, Win 98/2000/NT/XP	PCI/FireWire	N/A	32-96 kHz	24-bit
TerraTec	MIC 8	(8/8) XLR-1/4" combo	ADAT, S/PDIF, AES/EBU	Win 98/2000/NT/XP, Mac	PCI/FireWire	N/A	32-96 kHz	24-bit
TerraTec	SoundSystem DMX	Stereo line input, (2) stereo outputs	S/PDIF (coaxial, optical)	Win	PCI	DirectX	32, 44.1, 48 kHz	8/16-bit
TerraTec	SoundSystem XLerate	Stereo line input, stereo mic input, switchable stereo speaker/line output	N/A	Win	PCI	DirectX	Up to 48 kHz	8/16-bit
TerraTec	SoundSystem XLerate PRO	Stereo line input, (2) stereo outputs	Optical output	Win	PCI	DirectX	32, 44.1, 48 kHz	8/16-bit
Voyetra	Pinnacle Project Studio	3/1	S/PDIF (coaxial)	Win 3.1/95/98/NT	ISA	N/A	Up to 48 kHz	20-bit
Voyetra	Montego II Home Studio	1/2	S/PDIF (RCA or optical)	Win 95/98/NT	PCI	N/A	Up to 48 kHz	18-bit
Xyatar Digital Systems	IDMS232CDR Indigo Series	(2/2) TRS 3.5 mm		Proprietary	PCI	DirectX, VST proprietary	11-48 kHz	20-bit

Digital Recorder Resolutions (max)	Sync Types	MIDI Control	Tracks/Virtual Tracks	# of Locate Points	Effects/Dynamic Processing	Additional Features	List Price
32 float	SMPTE, AES reference, video ref	No	32	Unlimited	Y/Y	Complete turnkey with computer, etc	\$6,750
DSD	SMPTE, AES ref, word clock	No	4	Unlimited	Y/Y	Edits and authors DSD Audio as well as PCM Audio	\$10,750
24-bit	S/PDIF (dual card)	No	8	N/A	N/N	Input gain amplifier	\$499
24-bit	Word clock	No	N/A	N/A	N/N	Digital Mixer	\$799
N/A	DTRS	No	N/A	N/A	N/N	DTRS control software	\$599
24-bit	SMPTE	No	N/A	N/A	N/N	Professional mastering system	\$12,000
24-bit	MTC	No		N/A	N/N		\$849
N/A	N/A	No	N/A	N/A	N/N	Stereo input VU meter, phantom powered, insert jacks	\$849
24-bit	N/A	No	N/A	N/A	N/N	Bus powered, portable	\$695
32-bit	Nuendo Timebase	Yes	Unlimited	Unlimited	Y/Y	Networking capabilities, VST 3.0 audio engine, latency compensation, VST link, surround	\$1,499
N/A	Superclock/word clock	Yes	N/A	N/A	N/A	V-stack VST shell software included	\$399
24-bit	ADAT, word clock	No	26-channel	N/A	N/N	Digicheck software	\$589
24-bit	Word clock, ADAT	Yes	26-channel	N/A	N/N	(2) MIDI I/O, Digicheck software, meter bridge	\$599
24-bit	Word clock, ADAT	Yes	18-channel	N/A	N/N	MIDI I/O, Digicheck software, meter bridge	\$910
N/A	N/A	No	N/A	N/A	N/N		\$849
24-bit	N/A	No	N/A	N/A	Y/Y	Continually update with new plug-ins	\$1,299
24-bit	N/A	No	N/A	N/A	Y/Y	Continually update with new plug-ins	\$1,795
24-bit	Word clock, MIDI timecode	Yes	18	DAW locate controls	Y/Y	Editing and mixing controls, 4 MIDI I/O, (9) 100mm touch-sensitive faders, FE-8 fader expansion	\$1,599
N/A	N/A	No	N/A	N/A	N/N	Bundled w/Tascam's GigaStudio 24	\$369
24-bit	N/A	Yes	N/A	N/A	N/N	Self powered, bundled w/Tascam's GigaStudio 24, Steinberg's Cubasis recording/sequencing software	\$269
24-bit	N/A	Yes	N/A	N/A	N/N	Self powered via USB cable, ships w/Cubasis VST for Tascam US-224	\$375
24-bit	N/A	Yes	N/A	N/A	N/N	Bundled w/Cubasis VST for the Tascam US-428	\$625
24-bit	MTC	Yes	N/A	N/A	N/N	Front module, gain knobs, headphone, 5.1 playback	\$399
24-bit	MTC	Yes	N/A	N/A	N/N	2 MIDI ports	\$349
24-bit	N/A	Yes	N/A	N/A	N/N	Includes internal/external breakout box, fully routable I/O	\$599
24-bit	MTC	Yes	N/A	N/A	N/N	Daughter card expansion port	\$299
24-bit	LTC, MTC	Yes	N/A	N/A	N/N	32-ch MIDI	\$799
24-bit	LTC, MTC	Yes	N/A	N/A	N/N	32-ch MIDI	\$1,599
N/A	N/A	Yes	N/A	N/A	Y/N		\$199
N/A	N/A	Yes	N/A	N/A	Y/N		\$80
N/A	N/A	Yes	N/A	N/A	Y/Y		\$99
20-bit	SMPTE, MTC	Yes	System dependent	N/A	Y/N	Includes Digital Orchestrator Pro, wavetable sampler, patch editor/librarian software	\$460
18-bit	SMPTE, MTC	Yes	System dependent	N/A	Y/Y	Includes Digital Orchestrator Pro, Roland GS-compliant wavetable daughter card	\$299
20-bit	SMPTE, MTC	No	32/unlimited	Unlimited	Y/Y	Removable Sound Tray (6 to 100 hours record time per tray), Redbook CD mastering, mix console, more	\$2,299

Computer-Based Digital Audio Workstations

Manufacturer	Product	Analog I/O	Digital I/O	Platform Version	Bus Type	Plug-In Format(s) Supported	Sample Rate	A/D/A Converter/Bit Rate
Xytar Digital Systems	IDMS432CDR Indigo Series	(4/4) 3.5 mm TRS jacks	S/PDIF	Proprietary	PCI	DirectX, VST proprietary	11–48 kHz	20-bit
Xytar Digital Systems	IDMS832CDR Indigo Series	(8/8) supplied cables	S/PDIF	Proprietary	PCI	DirectX, VST proprietary	11–48 kHz	20-bit
Xytar Digital Systems	IDMS1632CDR Indigo Series	(16/16) supplied cables	S/PDIF	Proprietary	PCI	DirectX, VST proprietary	11–48 kHz	20-bit
Xytar Digital Systems	IDMS2432CDR Indigo Series	(24/24) supplied cables	S/PDIF	Proprietary	PCI	DirectX, VST proprietary	11–48 kHz	20-bit
Xytar Digital Systems	IDMS232CDRHD Indigo Series	(2/2) 3.5 mm TRS jacks	S/PDIF	Proprietary	PCI	DirectX, VST proprietary	11–96 kHz	24-bit
Xytar Digital Systems	IDMS432CDRHD Indigo Series	(4/4) 3.5 mm TRS jacks	S/PDIF	Proprietary	PCI	DirectX, VST proprietary	11–96 kHz	24-bit
Xytar Digital Systems	IDMS832CDRHD Indigo Series	(8/8) supplied cables	S/PDIF	Proprietary	PCI	DirectX, VST proprietary	11–96 kHz	24-bit
Xytar Digital Systems	IDMS1632CDRHD Indigo Series	(16/16) supplied cables	S/PDIF	Proprietary	PCI	DirectX, VST proprietary	11–96 kHz	24-bit
Xytar Digital Systems	IDMS2432CDRHD Indigo Series	(24/24) supplied cables	S/PDIF	Proprietary	PCI	DirectX, VST proprietary	11–96 kHz	24-bit
Xytar Digital Systems	TDMS232CDR Traveler Series	(2/2) 3.5 mm TRS jacks	S/PDIF, Xytar Sound Network Proprietary	Proprietary	Proprietary	DirectX, VST proprietary	11–48 kHz	20-bit
Xytar Digital Systems	TDMS832CDR Traveler Series	(8/8) supplied cables	S/PDIF, Xytar Sound Network Proprietary	Proprietary	Proprietary	DirectX, VST proprietary	11–48 kHz	20-bit
Xytar Digital Systems	TDMS1632CDR Traveler Series	(16/16) supplied cables	S/PDIF, Xytar Sound Network Proprietary	Proprietary	Proprietary	DirectX, VST proprietary	11–48 kHz	20-bit
Xytar Digital Systems	TDMS232CDRHD Traveler Series	(2/2) 3.5 mm TRS jacks	S/PDIF, Xytar Sound Network Proprietary	Proprietary	Proprietary	DirectX, VST proprietary	11–96 kHz	24-bit
Xytar Digital Systems	TDMS432CDRHD Traveler Series	(4/4) 3.5 mm TRS jacks	S/PDIF, Xytar Sound Network Proprietary	Proprietary	Proprietary	DirectX, VST proprietary	11–96 kHz	24-bit
Xytar Digital Systems	TDMS832CDRHD Traveler Series	(8/8) supplied cables	S/PDIF, Xytar Sound Network Proprietary	Proprietary	Proprietary	DirectX, VST proprietary	11–96 kHz	24-bit
Xytar Digital Systems	TDMS1632CDRHD Traveler Series	(16/16) supplied cables	S/PDIF, Xytar Sound Network Proprietary	Proprietary	Proprietary	DirectX, VST proprietary	11–96 kHz	24-bit
Xytar Digital Systems	TDMS432CDR Traveler Series	(4/4) 3.5 mm TRS jacks	S/PDIF, Xytar Sound Network Proprietary	Proprietary	PCI	DirectX, VST proprietary	11–48 kHz	20-bit
Yamaha	01X	(8/4) (2 XLR)	Coaxial	Win XP, Mac OS 9-X	mLAN	VST, AU	Up to 96 kHz	24-bit
Yamaha	UW10	(2/2) RCA	(1/1) optical (SPDIF)	Win XP	USB	ASIO	48 kHz	16-bit
YRS MIDI Systems	Digital Audio Workstation	8/8 RCA	2/2 S/PDIF (coaxial)	Win 98/2000/XP	PCI, USB, FireWire	VST, Direct X	8–96 kHz	A/D 24-bit, D/A 24-bit

Loop Sequencers

Manufacturer	Product	Version	Minimum System Requirements	Audio Recording/ File Editing	Bit Resolution	Sampling Rate (kHz)	Audio Volume Automation	File Formats Supported
A Designs	MP-2	N/A	None	Y/N	N/A	N/A	No	WAV
Ableton	Live	1.52	Mac OS 9, OS X, Win 98, 2000, XP, ME	Y/N	24-bit	96 kHz	Yes	WAV, AIFF
Adobe	Audition	1	Win 98SE, ME, 2000, XP, 400 MHz, 64 MB RAM	Y/Y	32-bit	192+ kHz	Yes	WAV, AIFF, MP3PRO, WMA, CEL, AU, VOX, PCM, more
BitHeadz, Inc.	Phrazer	2.0	Mac OS 9-X, OS X	Y/N	24-bit	96 kHz	Yes	WAV, AIFF, SD II, MP3, ACID I & II, CD Audio
Cakewalk	Project5	1.0.1	Win 2000, XP, 800 MHz, 256 MB RAM	N/N	24-bit	96 kHz	Yes	WAV, AIFF, LM4, Akai S5000/6000, Kurzweil K2000, SF2
Cycling '74	radial	1	Mac OS, 128 MB RAM	Y/N	32-bit	N/A	Yes	WAV, AIFF, SDII, MP3
IK Multimedia	GrooveMaker	2.5	Mac OS 8.5, OS X, Win 95, 98, ME, NT, 2000, XP 128 MB RAM	Y/Y	16-bit	44 kHz	No	WAV, AIFF, MP3
Sonic Foundry, Inc.	Acid Pro	4.0	Win 98SE, ME, 2000, XP, 300 MHz CPU, 64 MB RAM (128 MB recomm.)	Y/Y	16-bit, 24-bit	192 kHz	Yes	WAV, AIF, AVI, MOV, MP3 MPG, OGG, MID, PCA, RM, WMV, WMA
yowstar	Girl	2.1	G3 266 OS 8.5 or OS X, 64 MB RAM	Y/Y	Any	Any	Yes	All

Digital Recorder Resolutions (max)	Sync Types	MIDI Control	Tracks/Virtual Tracks	# of Locate Points	Effects/Dynamic Processing	Additional Features	List Price
20-bit	SMPTE, MTC	Optional	32/unlimited	Unlimited	Y/Y	Unlimited record time w/removable sound tray, ORB, mic mixing console, CD mastering	\$2,999
20-bit	SMPTE, MTC	Optional	32/unlimited	Unlimited	Y/Y	Unlimited record time w/removable sound tray, ORB, mic mixing console, CD mastering	\$6,499
20-bit	SMPTE, MTC	Optional	32/unlimited	Unlimited	Y/Y	Unlimited record time w/removable sound tray, ORB, mic mixing console, CD mastering	\$8,499
20-bit	SMPTE, MTC	Optional	32/unlimited	Unlimited	Y/Y	Unlimited record time w/removable sound tray, ORB, mic mixing console, CD mastering	\$10,499
24-bit	SMPTE, MTC	Optional	32/unlimited	Unlimited	Y/Y	Unlimited record time w/removable sound tray, ORB, mic mixing console, CD mastering	\$3,499
24-bit	SMPTE, MTC	Optional	32/unlimited	Unlimited	Y/Y	Unlimited record time w/removable sound tray, ORB, mic mixing console, CD mastering	\$3,999
24-bit	SMPTE, MTC	Optional	32/unlimited	Unlimited	Y/Y	Unlimited record time w/removable sound tray, ORB, mic mixing console, CD mastering	\$7,999
24-bit	SMPTE, MTC	Optional	32/unlimited	Unlimited	Y/Y	Unlimited record time w/removable sound tray, ORB, mic mixing console, CD mastering	\$9,999
24-bit	SMPTE, MTC	Optional	32/unlimited	Unlimited	Y/Y	Unlimited record time w/sound tray, ORB, mon, 48-ch mic mixer, FFT noise removal, 32-48 analog I/O	\$12,999
20-bit	SMPTE, MTC	Optional	32/unlimited	Unlimited	Y/Y	Line & 12 Volt operation, mic mixer, 125 hours non-compressed record time, CD mastering	\$1,999
20-bit	SMPTE, MTC	Optional	32/unlimited	Unlimited	Y/Y	Line & 12 Volt operation, mic mixer, 125 hours non-compressed record time, CD mastering	\$3,999
20-bit	SMPTE, MTC	Optional	32/unlimited	Unlimited	Y/Y	Line & 12 Volt operation, mic mixer, 125 hours non-compressed record time, CD mastering	\$4,999
24-bit	SMPTE, MTC	Optional	32/unlimited	Unlimited	Y/Y	Line & 12 Volt operation, mic mixer, 125 hours non-compressed record time, CD mastering	\$2,199
24-bit	SMPTE, MTC	Optional	32/unlimited	Unlimited	Y/Y	Line & 12 Volt operation, mic mixer, 125 hours non-compressed record time, CD mastering	\$2,599
24-bit	SMPTE, MTC	Optional	unlimited	Unlimited	Y/Y	Line & 12 Volt operation, mic mixer, 125 hours non-compressed record time, CD mastering	\$4,499
24-bit	SMPTE, MTC	Optional	32/unlimited	Unlimited	Y/Y	Line & 12 Volt operation, mic mixer, \$5,999 125 hours non-compressed record time, CD mastering	\$5,999
20-bit	SMPTE, MTC	Optional	32/unlimited	Unlimited	Y/Y	Line & 12 Volt operation, mic mixer, 125 hours non-compressed record time, CD mastering	\$2,299
24-bit	mLAN (word clock), S/PDIF	Yes	N/A	N/A	Y/Y	Stand-alone digital mixer, remote control surface for DAW, motorized faders, bundled VST plug-ins	\$1,700
N/A	N/A	No		N/A	N/N	Track down mode allows bouncing of virtual instrument and audio tracks	\$159
24-bit	All	Yes	Unlimited	9	Y/Y	Customized to your specifications	\$1,200-\$2,400

Plug-in Formats Supported	Includes DSP Effects	Effects Parameter Automation	Live-input Effects (Input Monitoring)	Event List	MIDI Controller Support	MIDI Recording/Editing/Playback	Step Sequencer	Multiple Loops per Track	Multitrack Audio Editing	Special Features	List Price
N/A	No	No	Yes	No	No	N/N/N	No	No	Yes	Stereo tube mic pre direct ins, phase switch, phantom switch, 600 ohm to 10k switch, combo xlr/1/4	\$1,499
VST	Yes	Yes	Yes	No	Yes	N/N/N	No	No	No	Resampling/Time-Warping/ReWire/unlimited undo/ASIO	\$349
DirectX	Yes	No	No	No	Yes	N/N/Y	No	Yes	Yes	Stereo and multitrack editor, 45+ effects, real-time effects & EQ, multi-I/O, mastering, batch processing	\$299
DirectConnect, MAS, ReWire	Yes	No	No	No	Yes	N/N/N	No	Yes	No	QuickTime movie support, support for live performance	\$299
DX, DXi, MFx, VST, VSTi, ReWire	Yes	Yes	Yes	Yes	Yes	Y/Y/Y	Yes	Yes	Yes	Pattern-based sequencers, looping tools, open-studio environment	\$429
VST	Yes	Yes	Yes	No	Yes	Y/N/N	Yes	No	No		\$249
N/A	No	No	No	No	Yes	N/N/N	No	Yes	Yes	Patented random groove generator, include up to 1,000 loops	\$129
DirectX, VSTi, DLS	Yes	Yes	Yes	Yes	Yes	Y/Y/Y	Yes	No	Yes	5.1 surround mixing, ASIO, MIDI piano-roll editing, alternate time signatures, Yamaha DPT support	\$500
VST	Yes	No	Yes	No	Yes	N/N/N	Yes	Yes	Yes	Scratch files with MsPinky vinyl, interactive loop controls	\$99

Editor/Librarian Software

Manufacturer	Product	Type	Minimum System Requirements	Category Search Features
Chicken Systems, Inc.	Constructor	Editor/Librarian	Win 98, Mac OS 8.6, 128 MB RAM	N/A
Emagic	SoundDiver	Editor/Librarian	Win 95, 98, NT, 2000, Mac OS 7.5.3	N/A
FMJ-Software	Awave Studio 8.8	Editor/Librarian	Win 9X, ME, NT, 2000, XP	N/A
Gefen Inc.	SFX Search	Librarian	Mac, Win, supports Digidesign, Pro Tools, Avid, and other workstations	Internet enabled, search online at www.sfxsearch.com
Gefen Inc.	SFX Net	Librarian	Mac, PC crossplatform software application versions, Mac and NT servers	Full bandwidth auditions, supports Digidesign, ProTools, Avid, Fairlight, other PC workstations
jambient Software	PowerMIDIverb4	Editor/Librarian	Win 98, XP, 32 MB	MIDIverb4
MAGIX Entertainment Corporation	Magix MP3 Maker 2004 Diamond	Editor	Win 98/98SE/ME/2000/NT/XP, 400 MHz CPU, 64 MB RAM, 250 MB Free, 16 bit full-duplex soundcard	CDDb, Supertagging, ID3
MOTU	Unisyn	Editor/Librarian	Win 98SE or higher, Mac OS 8.5 or higher	Name, comment, date, type, keyword, wildcard
Riden Consulting, Inc.	The Recording Music Library 5.1	Librarian	Win 95, system 7.1	Search by any and all categories
Riden Consulting, Inc.	The Band Music Library 5.1	Librarian	Win 95, system 7.1	Search by any and all fields
Riden Consulting, Inc.	The Choral Music Library 5.1	Librarian	Win 95, System 7.1	Search by any and all fields
Riden Consulting, Inc.	The Orchestra Music Library 5.1	Librarian	Win 95, system 7.1	Search by any and all fields
Riden Consulting, Inc.	The Keyboard Music Library 5.1	Librarian	Win 95, system 7.1	Search by any or all fields
Riden Consulting, Inc.	The Church Music Library 5.1	Librarian	Win 95, system 7.1	Search by any or all fields
Riden Consulting, Inc.	The Organist Music Library Plus 5.1	Librarian	Win 95, system 7.1	Search by any or all categories
Riden Consulting, Inc.	The Singer Music Library 5.1	Librarian	Win 95, system 7.1	Search by any or all categories
Roland Corporation	Fantom-S patch editing software	Editor/Librarian	Win XP/2000/ME, Mac OS 9	N/A
SmartSound Software, Inc.	SmartSound Sonicfire Pro 3.1	Editor/Librarian	Win 2000 or higher, Mac 9.2 or higher, 16 MB RAM, 16 MB disk space	N/A
SmartSound Software, Inc.	Movie Maestro 1.0	Editor/Librarian	Win 98 or higher, Mac OS 9 or higher	N/A
Sonic Desktop Software, Inc.	SmartSound Sonicfire Pro 2.1	Editor/Librarian	Win 98 or higher, Mac 9.0 or higher, 16 MB RAM, 16 MB disk space	N/A
Sound Quest Inc.	MIDI Quest Universal Editor/ Librarian 4	Editor/Librarian	Mac 1MB RAM	Search by name, comment, 16 assignable keys, duplicates, similar sounds
Sound Quest Inc.	MIDI Quest Universal Editor/ Librarian 9	Editor/Librarian	Win 98, ME, NT, 2000, XP, 32 MB RAM	Search by name, comment, 16 assignable keys, duplicates, similar sounds
Sound Quest Inc.	MIDI Quest Jr. 7	Librarian	Win 95, 98, ME, NT, 2000, XP	Search by name, comment, 16 assignable keys, duplicates, similar sounds
Sound Quest Inc.	MIDI Quest XL	Editor/Librarian	Win 98, ME, NT, 2000, XP, 48 MB RAM	Search by name, comment, 16 assignable keys, duplicates, similar sounds
Sound Quest Inc.	UniQuest Editor/Librarian 9	Editor/Librarian	Win 98, ME, NT, 2000, XP	Search by name, comment, 16 assignable keys, duplicates, similar sounds
Sound Quest Inc.	Solo Quest Editor/Librarian 7	Editor/Librarian	Win 95, 98, ME, NT, 2000, XP	Search by name, comment, 16 assignable keys, duplicates, similar sounds
Soundminer Inc.	Soundminer 3.0	Editor/Librarian	Mac Classic and OS X	Multiple category search
Soundminer Inc.	Ripper 3.0	Editor/Librarian	Mac Classic and OS X	Digitizes CD
Terzoid Software	NoiZe 3.2	Editor/Librarian	Win XP, 2000, ME, 98SE, 95	Keyword, name, description, notes
Terzoid Software	NoiZe:Lib 3.0	Librarian	Win 95, 98SE, ME	Keyword, name, description, notes

● STEALTH MP3s *continued from page 28*

Dragging an MP3-encoded WAV file onto the icon changes it back to an MP3. The program also works on groups of files. Unfortunately, it only works in Windows. I couldn't find a similar program for the Mac, although I successfully ran WaveMP3 under Connectix Virtual PC. (Incidentally, Virtual PC is a terrific tool for Web developers,

because it lets you quickly test your pages on multiple operating systems.)

During my file-format experiments, I noticed that I was able to "convert" MP3s to MP3-encoded WAVs and play them in Windows Media Player just by changing the file extension from MP3 to WAV, so I asked WaveMP3 author Luijer if his program was really

necessary. "Unfortunately, simply renaming an MP3 doesn't make it a real WAV file," he replied. That point was borne out when I tried unsuccessfully to open the bogus WAV file in other programs. "The reason Media Player will still play it is because it determines the format by looking at the contents of the file," Luijer continued. "Try renaming

Import/Export File Types	Number of Supported Devices	Number of Included Templates	Patch Randomize	Software Link to Sequencer	Test-sequence Playback	User-programmable Editors	Special Features	List Price
N/A	N/A	N/A	No	No	No	No	Load, edit, and save any Sampler Instrument file (with the samples) in a format-independent environment	\$200
SMF, SYX, Galaxy	346	N/A	Yes	Yes	Yes	Yes	Patch overview, screen sets	\$199
200 formats	200	N/A	No	No	Yes	Yes	Multi-purpose audio tool, reads many audio-carrying file formats	\$100
400 CDs to choose from. Several are in MP3 format for real-time sampling online.	N/A	N/A	No	No	Yes	No	Access/audition SFX instantly online at www.sfxsearch.com . Various categories.	\$5-\$15 per SFX
Sound Designer II, AIFF, WAV, MP3, and others. It supports any format that QuickTime 4.0 supports	N/A	N/A	No	No	Yes	No	Auditions and transfers any sound instantly from hard disk to workstation	\$995
SYX	1	N/A	No	No	No	No	Specially designed for the MIDI/Verb4	\$20
WAV, MP3, MP3PRO, WMA, OGG, CDDA, Play, ASF, WMA, REAL	Multiple	N/A	No	No	Yes	Yes	Music Editor, MP3 to WAV and WAV to MP3, unlimited encoding, CD burning, Internet Radio, database	\$35
SYX, X-OR, Galaxy	300	N/A	Yes	Yes	Yes	Yes	Unlimited undo/redo, studio snapshots, window sets, compare patch/bank, auto keyword assignment	\$195
FM*, SLK, TAB, TXT, WK1, WKS, DIF	1	Many	No	No	No	No	Designed for the home collector	\$49
FM*, SLK, TAB, TXT, WK1, WKS, DIF	1	Many	No	No	No	No	Manages all aspects of the school band program	\$129
FM*, SLK, TAB, TXT, WK1, WKS, DIF	1	Many	No	No	No	No	Manages all aspects of the school choral program	\$129
FM*, SLK, TAB, TXT, WK1, WKS, DIF	1	Many	No	No	No	No	Manages all aspects of the orchestra program	\$129
FM*, SLK, TAB, TXT, WK1, WKS, DIF	1	Many	No	No	No	No	Manages all aspects of the piano/keyboard teacher	\$129
FM*, SLK, TAB, TXT, WK1, WKS, DIF	1	Many	No	No	No	No	Manages all aspects of the church-music program	\$129
FM*, SLK, TAB, TXT, WK1, WKS, DIF	1	Many	No	No	No	No	18,000 hymns cross-referenced with 3,000 hymn tunes	\$199
FM*, SLK, TAB, TXT, WK1, WKS, DIF	1	Many	No	No	No	No	Designed for the classical singer/teacher	\$129
N/A	1	N/A	No	No	No	No	Links via USB to Fantom-S/S88	Ships w/ unit
AIFF, WAV, MP3 (import only), QuickTime, any QuickTime-compatible file type	N/A	N/A	No	No	No	No	Audio-editing software, music library, soundtrack creation software, professionally edits prerecord	\$2,999
WAV, AIFF, QuickTime, AVI	N/A	N/A	No	No	No	No	Music library, soundtrack creation	\$50
AIFF, WAV, MP3 (import only), QuickTime, any QuickTime-compatible file type	N/A	N/A	No	No	No	No	Audio-editing software, music library, soundtrack creation software, professionally edits prerecorded royalty-free music	\$349
SYX, SMF, customizable import filters	300	600	Yes	No	Yes	Yes		\$99
SYX, SMF, customizable import filters	500	1,039	Yes	Yes	Yes	Yes	Parent/child editing, Sonar Name support, skins, 70,000 patches	\$199
SYX, SMF, custom import filters	400	400	Yes	No	Yes	No	Sonar Name support, 60,000 patches, video tutorials, patch auditioning	\$79
SYX, SMF, customizable import filters	600+	1155	Yes	Yes	Yes	Yes	VST, MFX & OPT plug-ins, parent/child editing, SONAR/Cubase/XML Name support	\$299
SYX, SMF, customizable import filters	300	800	Yes	No	Yes	No	Parent/child editing, Sonar Name support, skins, 60,000 patches, automation	\$99
SYX, SMF, customizable import filters	300	800	Yes	No	Yes	No	Parent/child editing, Sonar Name support, skins, 60,000 patches, automation	\$99
SD2F, AIFF, BWAV, AIFC, MP3, MP4, SampleCell	N/A	N/A	No	Yes	No	No	Feature list at www.soundminer.com	\$895
AIFF, MP4, SD2F, BWAV	N/A	N/A	No	No	No	No	Converts commercial SFX CDs to format with embedded metadata	\$295
SYX	50	33	Yes	No	Yes	No	Project oriented, multiple windows, customizable layouts, variable size banks, virtual keyboard	\$100
SYX	50	N/A	No	No	Yes	Yes	Project oriented, multiple windows, interactive librarian module creator	\$40

ing an MP3 or WAV to DOC and opening it in Media Player [from the File menu by setting the file type to 'All files']. It will still play."

Luijter also notes that it's not possible to rewrite the file chunks with a text editor, because "MP3 files and the WAV header use raw byte data—values from 0 to 255." It might be possible

with a binary file-viewing utility and a morbidly detailed knowledge of the file formats, but we're here to make music.

IT'S A BRAND-NEW WAV

Rather than disguise an MP3 as a WAV to sneak it onto a Web page, you can embed the MP3 itself, using the syntax in the "Embedding Manual" sidebar.

But for that to work, your server must be configured to handle the MP3 MIME type. Also, some Web-hosting services specifically prohibit MP3s. With Macromedia's Flash Player supposedly deployed in 90 percent of browsers, saving the MP3 as a Flash file is a good alternative. Another option is to save the MP3 as an audio-only

MIDI Keyboard Controllers

Manufacturer	Product	Number of Keys	Full-size Keys	Type of Action	Aftertouch	Number of Zones/Overlapping	Computer Interface	Displays	Footswitchable Patch Changes	Independent MIDI Ins/Outs
Alternate Mode, Inc.	malletKAT 4.0	39	No	Unweighted	Poly	Unlimited	None	4, 16	Chains	1/2
Creative Labs	Creative Prodikeys	37	No	Unweighted	None	N/A	PS/2	On computer monitor	None	0/1
Doepfer	PK88	88	Yes	Weighted	None	0/No	MIDI	None	None	0/2
Doepfer	LMK2+	88	Yes	Weighted	Channel	4/Yes	None	3-digit LED	None	0/1
Doepfer	LMK4+	88	Yes	Weighted	Channel	8/Yes	MIDI	2x16	Chains	2/2
Doepfer	SK2000	88	Yes	Weighted	None	2/Yes	None	None	None	1/1
Edirol	PCR-50	49	Yes	Unweighted	None	N/A	USB	LED	None	1/1
Edirol	PCR-30	32	Yes	Unweighted	None	N/A	USB	LED	None	1/1
Edirol	PCR-80	61	Yes	Unweighted	None	N/A	USB	LED	None	1/1
Edirol	PCR-A30	32	Yes	Unweighted	None	1/No	USB	LED	None	1/1
Evolution	MK-225C	25	Yes	Unweighted	None	0/No	USB, MIDI, Gameport	LED (3 digit blue)	None	0/1
Evolution	MK-249	49	Yes	Unweighted	None	0/No	USB, MIDI, Gameport	LED (3 digit blue)	None	0/1
Evolution	MK-249C	49	Yes	Unweighted	None	0/No	USB, MIDI, Gameport	LED (3 digit blue)	None	0/1
Evolution	MK-361	61	Yes	Unweighted	None	0/No	USB, MIDI, Gameport	LED (3 digit blue)	None	0/1
Evolution	MK-361C	61	Yes	Unweighted	None	0/No	USB, MIDI, Gameport	LED (3 digit blue)	None	0/1
Korg USA	microKONTROL	37	No	Unweighted	None	1/No	USB	9 multicolor backlit LCDs	None	1/1
M-Audio	USB Keystation 49	49	Yes	Unweighted	None	0/No	USB	LED (3 digit)	None	0/1
M-Audio	USB Keystation 61	61	Yes	Unweighted	None	0/No	USB	LED (3 digit)	None	0/1
M-Audio	Oxygen 8	24	Yes	Unweighted	None	0/No	USB	LED (3 digit)	None	0/1
MIDtech	MIDistudio 2	49	Yes	Unweighted	None	1/No	USB	LED (3 digit)	Increment	1/1
MIDtech	MIDicontrol 2	49	Yes	Unweighted	None	1/No	USB	LED (3 digit)	Increment	1/1
TerraTec	MIDI master USB	49	Yes	Unweighted	Poly	0/No	USB	LED (3 digit)	Chains	0/1

● STEALTH MP3s

QuickTime movie with the extension MOV; although not as universal as WAV or Flash, QuickTime is reasonably well supported.

Nonetheless, there's a lot to be said for near-universal compatibility. "I actually did a rewrite of WaveMP3 because I received many requests from users of Flak MPEG and VirtualDub," says Luijer. "Those programs are used to make backup copies of DVD-video discs and to recode DVDs to the new DivX format [for CD-ROM]. They support only WAV files as audio input, so people are using my program to be able to use MP3s."

If you don't label your MP3-encoded WAVs clearly, you could inadvertently use one in a situation in which you would otherwise want a high-quality WAV file—burning a CD, for example. Besides that, I've found only one drawback with the format, and although it's potentially serious, it probably won't affect many people. Specifically, the Mac version of Microsoft Internet Explorer crashes if RealNetworks' RealPlayer has been set to handle WAV files and the Mac tries to load a page with embedded MP3 WAVs.

"On Windows systems it all seems to work nicely," Luijer says. "Because the

WAV format was designed to be flexible, it is not very optimized when it comes to adding data like cue points, playlists, and so on. Those chunks need to be 'wrapped' inside subchunks and filled with 'junk' chunks—empty bytes—to make sure they're all correctly aligned, which increases the file size. Another drawback of the format is that it's not streamable. But apart from those minor drawbacks, it's a good, well-thought-out format."

David Battino makes big sounds and little sounds for *Batmosphere.com*, a music-technology consulting service.

Programmable Continuous Footswitches	Programmable Footswitches	Programmable Controllers	System Real-time Controls	Velocity Curves: # of Preset/Programmable	Dimensions (WxHxD)	Weight (lbs.)	Special Features	List Price
2	2	Keyboard acts as slider/wheel	Yes	8/0	47x11x2.5	28 lbs.	Latch modes per pad, keyboard acts as multiple-cc# controller	\$2,095
N/A	N/A	N/A	N/A	N/A	N/A	7.28	PC/music keyboard in one. 104-key keyboard w/ 37 touch sensitive music keys. Play/Learn/Create/Record	\$99
1	1	0	N/A	N/A	53.1x10.6x4.3	40 lbs.	Built into flight case with handle, pop the lid, plug and play	\$850
1	2	2	Start, stop, continue	8/0	57.1x10.2x4	44 lbs.	Hammer-action keyboard, built into a black flight case with removable lid	\$1,100
2	2	2 wheels, 2 sliders, 1 rotary control	Start, stop, continue, clock	32/0	61x10.2x4	53 lbs.	Built into a flight case with removable lid, hammer-action keys	\$1,400
0	2	N/A	N/A	N/A	53.2x11x4.7	44 lbs.	Built-in Yamaha sound card, hammer-action keys, built into a black flight case with removable lid	\$1,000
1	1	8 faders, 8 knobs, 9 buttons	Dynamically assignable	N/A	N/A	N/A	Faders, knobs, buttons assignable to Note, Timing clock, Control Change, RPN, NRPN, SysEx	\$295
1	1	8 faders, 8 knobs, 8 buttons	Dynamically assignable	N/A	N/A	N/A	Faders, knobs, and buttons can be assigned to Note, Timing clock, Control Change, RPN, NRPN, SysEx	\$225
1	1	1 pitch-mod X/Y stick, 8 sliders, 8 knobs, 9 buttons (assignable)	Dynamically assignable	N/A	N/A	N/A	27 assignable controls, 16 memory points, assignment software, USB powered	\$395
1	1	Assignable controls: 8 sliders, 8 knobs, 9 buttons, 1 sustain & 1 expression pedal	Dynamically assignable real-time controls	N/A	N/A	N/A	Built-in 24-bit/96kHz audio interface, USB powered	\$395
0	0	1 wheel, 8 rotary	N/A	12/0	18.9x3.9x8.3	4.4 lbs.	Fully Class Compliant	\$159
0	0	1 slider, 1 wheel	N/A	12/0	31.5x3.2x8.3	7 lbs.	Provides USB/MIDI interface	\$189
0	0	1 slider, 1 wheel, 12 rotary	N/A	12/0	31.5x3.9x8.3	7 lbs.	Provides USB/MIDI interface	\$210
0	0	1 slider, 1 wheel	N/A	12/0	38.2x3.2x8.3	9 lbs.	Provides USB/MIDI interface	\$239
0	0	1 slider, 1 wheel, 16 rotary	N/A	12/0	38.2x3.9x8.3	9 lbs.	Provides USB/MIDI interface	\$285
N/A	1	8 sliders/8 rotary encoders/ joystick (with switch) 16 illuminated dynamic trigger pads	Song position pointer, song select, tune request, tap, start, continue, stop, active sensing, sys. reset	9/0	20.6x2.8x9.1	5.7 lbs.	12 scenes, battery/USB/AC power, librarian w/templates for popular DAW/sequencing/soft synth programs	\$350
0	0	1 slider, any CC#	N/A	1/1	30x9x2.5	N/A	USB powered/battery/power supply, USB MIDI out, Win 98-XP & Mac OS 8.6-9.22/10.1.5/10.2 + support	\$230
0	0	1 slider	N/A	1/1	36x8.5x3	N/A	USB powered/external power supply, support for Win 98-XP & Mac OS 8.6-9.22/10.1.5/10.2	\$280
0	0	8 knobs, 5 banks of knobs, any CC#, each on any MIDI Channel	1 programmable slider	1/1	16x9.5x3	N/A	USB powered/battery/power supply, 5 banks of 8 programmable knobs, OS X support	\$180
0	1	1 pitch wheel, 1 mod wheel	N/A	N/A	33x8x3	7.5 lbs.	Splitpoint	\$199
0	1	1 pitch wheel, 1 mod wheel	14 assignable controllers	1/0	30x9x3	7 lbs.	Splitpoint	\$299
1	1	1 pitch wheel, 1 mod wheel	N/A	N/A	33.5x9.8x4.3	10 lbs.	10 programmable preset memories, nonvolatile. Acts as a MIDI interface via USB. MAC & PC drivers.	\$399

Interactive Music-Composition/Auto-Accompaniment Software

Manufacturer	Product	Minimum System Requirements	Audio Support	# of Chords per Measure	# of Styles	# Editable/User-created Styles	Maximum # of Generated Parts	Generates Chord Progression	Guarantees Solo Part	Melody Harmonizing	Odd Meters	Prints Chart/Notation/Tablature	Records User Performance	Records MIDI Control Change Messages	Resolution (ppqn)	Regulation	Individual Parts	Style Changes Within Song	Support for nonGM/XG Instruments	Special Features	List Price
GenieSys Voice L.C.	Uhm-Tza-Tzar 1.0	P II-266, Win 98, 32 MB RAM	No	32	Unlimited	Unlimited	5	Yes	Yes	No	Yes	N/N/N	MIDI	Yes	960 ppqn	Yes	No	No	No	Virtual 5-channel MIDI ins/outs driver	\$35
MakeMusic!, Inc./Coda Music Technologies	SmartMusic Studio 8.1	Win 98/ME/2000/XP 128 MB RAM, Mac G3 OS 8.6 or OS 9.x	Yes	N/A	All	Unlimited	N/A	No	Yes	No	Yes	N/N/N	Audio	No	N/A	No	No	No	No	Intelligent Accompaniment, 20,000 accompaniments, band & string methods	\$120
MiBAC Music Software, Inc.	MiBAC Jazz	Win 95, 98, ME, NT4, 2000, XP Mac OS 8, OS 9. Serial or USB	Yes	2	12	None	3	No	No	No	No	Y/N/N	N/A	No	125	No	Yes	Yes	Yes	Flexible song forms, lg. chord vocab, print lead sheets, export standard MIDI files	\$125
QRS Music Technologies, Inc.	Gulbransen Digital Hymnal	None	Yes	N/A	127	None	3	No	Yes	Yes	Yes	N/N/N	N/A	No	N/A	No	Yes	No	No	Memory contains thousands of popular hymns	\$1,175

MIDI Control Surfaces

Manufacturer	Product	Minimum System Requirements	Computer Interface	Displays	Number of Faders	Number of Knobs	Footpedal Inputs	Software-assignable Switches
Doefer	Pocket Dial	Any	MIDI	N/A	N/A	16	N/A	N/A
Doefer	Pocket Fader	Any	MIDI	N/A	16	N/A	N/A	N/A
Doefer	Drehbank	Any	MIDI	N/A	N/A	2x64	8	N/A
Doefer	Regelwerk	Any	MIDI	2x16	24	N/A	N/A	48
Doefer	Pocket Control	N/A	MIDI	none	N/A	16	N/A	N/A
Doefer	MAQ16/3	N/A	MIDI	3-digit LED display, 48 LEDs	N/A	48	N/A	N/A
Emagic	Logic Control	Logic Platinum 5 or higher, 1 free MIDI in & 1 MIDI out port	MIDI	Multifunction display, channel assignment, song position	9	8	2	N/A
Event Electronics	EZbus	Win, Mac	USB	LCD/LED	9	1	1	37
Evolution	UC-16	Win 98, ME, 2000, XP, 128MB, Mac OS 9/X/Jaguar	USB, MIDI	3 digit blue LED display	N/A	16	N/A	N/A
Infusion Systems Ltd.	I-CubeX	Win 98 or Mac OS 9	USB, Serial, FireWire	Computer monitor	32	32	32	32
JLCooper Electronics	MCS-3800 USB Software Option	Mac OS 9.2, OSX, Win	USB	N/A	N/A	N/A	N/A	N/A
JLCooper Electronics	MCS-Bridge, Channel display and pan option 1.05	Cross-platform	Telephone connection to MCS-3000 series	8 multicolor switches/display	N/A	16	N/A	8
JLCooper Electronics	MCS3-USB with Software Editor	Win, Mac	USB	N/A	N/A	N/A	N/A	24
JLCooper Electronics	FM-4/100	Win, Mac	USB, Serial RS-422, RS-232, MIDI	LED indicators	4	N/A	N/A	10
JLCooper Electronics	ES-4/100	Win XP, Mac OSX	USB	LED for channel functions	4	N/A	N/A	18
JLCooper Electronics	ES-8/100	Win XP, Mac OSX	USB, RS-422, RS-232, and MIDI	LED track status	8	N/A	N/A	32
JLCooper Electronics	MCS-3000X	MIDI	MIDI	LED track status	8	N/A	N/A	32
JLCooper Electronics	MCS-Panner	N/A	MIDI	LED	N/A	5	N/A	9
JLCooper Electronics	MCS-Clipshot	N/A	USB, RS-422, RS-232 and Ethernet	On every switch, LED	N/A	N/A	N/A	60
Mackie Designs	Mackie Control Universal	N/A	MIDI	N/A	9	8	N/A	N/A
Mackie Designs	HUI	N/A	Serial	N/A	8	13	2	8
Mackie Designs	Baby HUI	N/A	MIDI	N/A	8	8	N/A	N/A
Mixed Logic	Mixed Logic M24 1.7	Win, Mac	USB, MIDI	LCD	24	54	N/A	147

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Sends Sysex Strings	Transport Controls	Track Switches	Automation Type	Dimensions (inches)	Weight (lbs.)	Special Features	List Price
No	No	N/A	N/A	9.5x3.5x2.5	4	16 endless encoders, 128 user definable presets, free editor, silver-gray metal case, blue LEDs	\$239
No	No	N/A	N/A	10x4.5x2.5	4	16 ALPS faders, 128 user definable presets, free editor, silver-gray metal case, blue LED	\$239
Yes	No	N/A	N/A	17.25x5x2	8	Two bank buttons, CC and Sysex programmable, free editor software (Sounddiver OEM version)	\$400
Yes	No	48 programmable buttons	N/A	19x9x3.5	8	ALPS faders, all faders and buttons are fully programmable	\$750
No	No	N/A	N/A	6.7x2.8x1.6	0.7	128 user definable presets, free editor software (PC version)	\$150
No	No	N/A	N/A	18.9x7x4.3	6.6	MIDI and CV/Gate Analog sequencer, 3 rows with 16 controls each	\$750
Yes	Yes	4 buttons with integrated LED for functions such as record, solo	MIDI	17.6x3.8x17.8	11		\$1,299
No	Yes	11	MIDI	16.75x2.25x9.5	12	Audio interface w/mic/line/inst. ins, 8 x analog outs, ADAT & S/PDIF I/O, dig. mixer w/EQ & dyn	\$749
No	No	None	MIDI	12x2x4.8	2	25 non-volatile memories to store 25 sets	\$139
Yes	Yes	N/A	MIDI	4.8x3.7x1.3	0.4	MIDI Sensor Development Environment, Use with Infusion Sensors to create alternate MIDI controllers	\$649
No	No	Mute, solo, select, insert	MIDI	N/A	N/A	Allows MCS-3000 series controllers to control any application via USB with custom editor software	\$299
No	No	Record, meter, pan, scribble strip track names	MIDI	9.25x6.25x2.0	N/A	Pro Tools Support added to new revision 1.05 using HUI personality	\$999
No	Yes	User assignable	MIDI	6.5x7x1.25	5	Jog/shuttle custom software can create keysets to control any DAW or NLE video application	\$599
No	No	Mute, solo, select, aux	MIDI	6.5x8.5x3	5	Professional, motorized, touch-sensitive faders, compact design	\$900
No	No	Bank select, mute, solo, record	MIDI	6x10x2.5	5	USB, RS-422, RS-232	\$899
No	No	Mute, solo, record, aux, and bank select	MIDI	10.75x10.5x3	6	8 touch-sensitive faders	\$1,499
No	No	Mute, solo, aux record	MIDI	11x11.25x2	9	64 channel Pro Tools mode, Avid support and MIDI	\$1,900
No	No	Select, software dependant	MIDI	6.25x11.25x2.5	3	3-axis joystick mechanism for surround panning	\$999
No	Yes	N/A	MIDI, internal	13x10x2.5	20	Instant access to audio clips, LCD buttons and Query keyboard	\$4,999
No	Yes	Mute, solo, channel select, record arming, V-Pot	MIDI	N/A	N/A	Software support includes Logic Audio, Pro Tools, Digital Performer, SONAR, Cubase, Nuendo, more	\$1,299
No	Yes	Mute, solo, select, auto, rec/rdy, insert, v sel.	MIDI	20.8x6.9x22.6	37		\$2,999
No	No	Mute, solo	MIDI	14.6x3.4x10.1	7.6		\$799
Yes	Yes	Mute, solo, select, pre/post, rec. enable, automation, more	MIDI, internal	37.5x5x17 before options	38	Extensive control of multiple plug-ins, custom control assignment, full EQ and dynamics section	\$3,499



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Computer Music Product Guide 2004 55

MIDI Interfaces, Patch Bays, and Processors

Manufacturer	Product	Computer interface	# of MIDI Ins/Outs	Merging	Filtering	Rechannelizing	Controller Remapping	Keyboard Split/Zones	# of Patches	Synchronization Type	Special Features	List Price
Audiotrak	XP MIDIMate	USB	1/1	No	No	No	No	No	N/A	N/A	Win XP, Mac OS 10.x only, tiny cable type	\$19
DACS	MIDI Patch Bay	N/A	10/10	No	No	No	No	No	N/A	N/A	Uses 1/4" patch cords, operates like audio patchbay	\$295
Digidesign	MIDI I/O	USB	10/10	No	Yes	Yes	No	No	N/A	N/A	USB powered, full OMS/WDM compatibility, Hardware Thru, MIDI Time Stamping	\$595
Doepfer	CTM64	MIDI	1/1	No	No	No	No	No	N/A	N/A	Contact-to-MIDI interface for up to 64 contacts for DIY switchboards, keyboards, prg-change boards	\$125
Doepfer	MCV4	MIDI	1/1	No	No	No	No	No	N/A	Ctrl voltg/gate-analog synths	Two MIDI assignable CV outputs	\$138
Doepfer	MCV24	MIDI	1/2	No	No	No	No	No	16	MIDI, ctrl voltg, gate	Four high res. CV outs for pitch and 20 outs for gate or cv	\$595
Doepfer	MSYII	MIDI	1/2	No	No	No	No	No	N/A	MIDI, Sync24, clock out	MIDI to Sync24, clock output	\$110
Doepfer	MTC64	MIDI	1/1	No	No	No	No	No	N/A	N/A	Interface with 0/5V outputs to control up to 64 relays, lamps, motors, magnets via MIDI note on/off	\$125
Doepfer	Pocket Electronic	MIDI	1/1	No	No	No	No	No	N/A	N/A	16 controls (potentiometers, faders, buttons, switches) can be connected, transmit 16 MIDI CC	\$100
Edirol	UM-2C	USB	2/2	No	No	No	No	No	N/A	MTC	Power supplied by USB	\$75
Edirol	UM-550	USB, Win, Mac	5/5	Yes	Yes	No	No	No	N/A	MTC	Fast Processing Technology guarantees low-latency, low-jitter MIDI transmission	\$240
Edirol	UM-880	USB, Win, Mac	8/8	Yes	Yes	No	No	No	N/A	MTC	FPT & HDMR for low-latency, low-jitter MIDI transmission	\$375
Edirol	UM-1X	USB	1/1	No	No	No	No	No	N/A	MTC	Complete connection between computer & MIDI device, MIDI Indicators, OS Driver switchable	\$50
Edirol	UM-1SX	Win, Mac	1/1	No	No	No	No	No	N/A	MTC	MIDI Indicators, OS Driver switch	\$45
Emagic	AMT 8	USB, Serial	8/8	Yes	Yes	No	No	No	32	N/A	Expandable to 192 MIDI I/O, Mac/PC	\$499
Emagic	MT4	USB	2/4	Yes	Yes	No	No	No	32	N/A	Software included for patch-bay programming, Mac/PC	\$199
Emagic	Unitor 8 MkII	USB, Serial	8/8	Yes	Yes	No	No	No	32	SMPTE, VTC	VTC burn-in, click in, OMS, Mac/PC	\$799
Encore Electronics	Expressionist 2 MIDI/CV interface	Win, Mac	1/1	Yes	Yes	No	No	6	100	MIDI clock	16-bit D/A all channels	\$499
ESI	MIDlterminal M8U	USB	8/8	No	No	No	No	No	N/A	N/A	Various MIDI THRU function, connects via USB, Win XP, and Mac OS X only	\$329
ESI	MIDlterminal M4U	USB	4/4	No	No	No	No	No	N/A	N/A	Connects via USB, Win XP, and Mac OS X only	\$119
ESI	MIDlterminal 8180FS	FireWire	8/8	No	No	No	No	No	N/A	SMPTE I/O, word clock out, video sync in	Connects via FireWire, SMPTE I/O, standalone MIDI Thru/patch bay	\$TBA
ESI	RoMi/O	USB	1/2	No	No	No	No	No	N/A	N/A	Connects via USB, Win XP, and Mac OS X only	\$69
Friend Chip	DMX 12/12	Win, Mac	1/1	No	No	No	No	No	N/A	N/A	6 optical in/out, 6 coaxial in/out, S/PDIF, and ADAT	\$749
Friend Chip	DMX 16	MIDI	1/1	No	No	No	No	No	50	N/A	16 stereo channel digital patch bay for AES/EBU, S/PDIF, or 16 x ADAT	\$798-\$1,545
Friend Chip	DMX 32	MIDI	1/1	No	No	No	No	No	50	N/A	32 stereo channel digital patch bay for AES/EBU, S/PDIF, or 32 x ADAT	\$1,048-\$2,791
Frontier Design Group	Sierra MIDI/SMPTE	PCI	8/8	No	No	No	No	No	N/A	MTC, SMPTE (LTC)	Dedicated SMPTE I/O	\$299
JL Cooper Electronics	9 Pin/MMC	Win, Mac	1/1	No	No	No	No	No	N/A	GVG, ESAM2, MIDI, MMC	Control MMC via VTR 9-pin control	\$499
JL Cooper Electronics	MLA-1/MLA-10	N/A	4/4	No	No	No	No	No	N/A	N/A	Extends the range of MIDI cables to over 1,000'	\$499
JL Cooper Electronics	MLA-XLR	N/A	1/1	No	No	No	No	No	N/A	N/A	Extends the range of MIDI cables to over 1,000'	\$199
JL Cooper Electronics	MMC/9 Pin +	Win, Mac	1/1	No	No	No	No	No	N/A	Video, SMPTE	VTR 9-pin RS-422 control from MMC	\$499
JL Cooper Electronics	PPS-2	Win, Mac, MIDI	1/1	Yes	No	No	No	No	N/A	SMPTE, MTC, MIDI Clock, Smart FSK	Allows MIDI clock sequencers/workstations like Triton and Kurzweil to sync to recorders/tape/HD	\$170
M-Audio	Macman	Mac	1/3	No	No	No	No	No	N/A	N/A	Passive thru, serial thru (geo port)	\$60
M-Audio	Merge 2x2	N/A	2/2	Yes	No	No	No	No	N/A	N/A		\$100
M-Audio	Thru 1x4	N/A	1/4	No	No	No	No	No	N/A	N/A		\$60
M-Audio	Thru 3x8	N/A	3/8	No	No	No	No	No	N/A	N/A		\$100

MIDI Interfaces, Patch Bays, and Processors

Manufacturer	Product	Computer Interface	# of MIDI Ins/Outs	Merging	Filtering	Rechannelizing	Controller Remapping	Keyboard Split/Zones	# of Patches	Synchronization Type	Special Features	List Price
M-Audio	USB MIDISport 1x1	USB	1/1	No	No	No	No	No	N/A	N/A	USB cable included, Mac/PC	\$70
M-Audio	USB MIDISport 2x2	USB	2/2	No	No	No	No	No	N/A	N/A	USB cable included, Mac/PC	\$90
M-Audio	USB MIDISport 4x4	USB	4/4	No	No	No	No	No	N/A	N/A	USB cable included, Mac/PC	\$200
M-Audio	USB MIDISport 8x8	USB	8/8	Yes	No	No	No	No	N/A	SMPTE, MTC	USB and serial cable included, Mac/PC	\$399
MIDIator	LD1	N/A	1/1	No	No	No	No	No	N/A	N/A	MIDI long cable driver, up to 1,000 ft.	\$82
MIDIator	MP-128EP	Parallel	1/2	No	No	No	No	No	N/A	N/A		\$80
MIDIator	MP-128NP	Parallel	2/4	No	No	No	No	No	N/A	N/A		\$110
MIDIator	MP-128SP	Parallel	2/8	No	No	No	No	No	N/A	SMPTE	SMPTE in and out	\$180
MIDIator	MS-101	Serial	1/1	No	No	No	No	No	N/A	N/A		\$70
MIDIator	MS-124	Serial	1/4	No	No	No	No	No	N/A	N/A		\$100
MIDIator	MS-124W	UNIX, serial	1/4	No	No	No	No	No	N/A	No		\$160
MIDIator	UM1	N/A	1/1	No	No	No	No	No	N/A	N/A	Keyboard encoder, solenoid low-side driver up to 128 lines	\$215-\$345
MIDIator	UM2	N/A	1/1	No	No	No	No	No	N/A	N/A	Solenoid high-side driver up to 128 lines	\$195-\$330
MIDIator	UM0	N/A	1/1	No	No	No	No	No	N/A	N/A	Solenoid low-side driver, up to 128 lines, no case	\$177
MIDI Solutions	Mapper	N/A	1/1	No	No	No	Yes	No	N/A	N/A	Maps one type of MIDI message (ex. Control Change) to another type	\$149
MIDI Solutions	Merger/Quadra Merge/M8	N/A	2/1, 4/1, 8/1	Yes	No	No	No	No	N/A	N/A	Merges all messages received at the MIDI inputs to the MIDI output	\$79/\$129/\$279
MIDI Solutions	Relay/R8	N/A	1/1, 1/1	No	No	No	No	No	N/A	N/A	MIDI to contact closure products	\$149/\$479
MIDI Solutions	Router	N/A	1/2	No	Yes	Yes	No	Yes/10	N/A	N/A	Routes/filters/rechannelizes MIDI data to either of two MIDI outputs	\$149
MIDI Solutions	Thru/Quadra Thru/T8	N/A	1/2, 1/4, 1/8	No	No	No	No	No	N/A	N/A	Provides additional MIDI outputs from a single MIDI input	\$49/\$59/\$199
MIDI Solutions	Velocity Converter	N/A	1/1	No	No	No	No	No	N/A	N/A	Applies velocity curves to MIDI data	\$149
MIDI Solutions	Footswitch Controller/F8	N/A	1/1, 1/1	Yes	No	Yes	No	No	N/A	N/A	Contact closure to MIDI products	\$149/\$329
MIDI Solutions	Breath Controller	N/A	1/1	Yes	No	No	No	No	N/A	N/A	Generates MIDI messages from the Yamaha BC3A	\$199
MIDI Solutions	Pedal Controller	N/A	1/1	Yes	No	No	No	No	N/A	N/A	Generates MIDI messages from an external expression pedal	\$149
MIDtemp	Multiplayer MP88-CDW 4.30	SCSI	8/8	Yes	Yes	Yes	Yes	Yes/16	1024	MIDI clock	MIDI file player, wave player, CD-ROM, hard disk, remote controller	\$1,500
MIDtemp	Multistation 2.0	USB	8/8	Yes	Yes	Yes	Yes	Yes/16	16384	MIDI clock, MTC	MIDI file player, MP3 player, 8 tracks Wave player, remote controller with touch	\$2,600
MOTU	FastLane Serial	Mac serial	1/3	No	No	No	No	No	N/A	N/A	Powers off computer, bypass for use when computer is off	\$59
MOTU	Micro Express-USB	USB, serial	4/6	Yes	Yes	Yes	No	No	16	SMPTE, MTC	Operates w/o computer, supps MMC, converts click to MIDI, 2 pedal ins	\$295
MOTU	MIDI Express XT-USB	USB, serial	8/9	Yes	Yes	Yes	No	No	16	SMPTE, MTC	Operates w/o computer, supps MMC, converts click to MIDI, 2 pedal ins	\$395
MOTU	MIDI Timepiece AV-USB	USB, serial	8/8	Yes	Yes	Yes	No	No	128	SMPTE, MTC, video, word clock	Operates w/o computer, MIDI time stamping, many A/V sync features	\$595
MOTU	PC MIDI Flyer	Parallel	2/2	No	No	No	No	No	N/A	N/A	Powers off computer, bypass for use when computer is off	\$89
MOTU	Pocket Express	Serial, Parallel	2/4	No	No	No	No	No	N/A	SMPTE, MTC	Operates w/o computer, SMPTE free-wheeling over drop-outs	\$165
MOTU	FastLane USB	USB	2/2	No	No	No	No	No	N/A	N/A	5 colors + charcoal, thru button passes MIDI in to out w/computer off	\$79
Roland	GI-20	USB Win, Mac	1/1	Yes	Yes	Yes	Yes	Yes/6	50	MIDI	Guitar-MIDI, 13-pin din pickup, USB, tuner, transposer, direct guitar out, 1/2U	\$395
Rolls	RFX MP1288 MIDI Wizard	N/A	1/1	Yes	No	No	Yes	No	128	N/A	MIDI song select & str/strp, up to 8 program changes on 8 MIDI chans w/1 switch, 8 CCs	\$200
Rolls	RP93s Patchwork	MIDI	1/1	No	No	No	No	No	128	MIDI	MIDI controlled audio switcher and effects loop	\$200
Steinberg	Midex 3	Win, Mac	1/3	Yes	Yes	No	No	No	128	LTB linear	Time-base technology	\$150
Steinberg	Midex 8	Win, Mac	8/8	Yes	Yes	No	No	No	128	LTB	USB, cable checker, MIDI thru	\$499
Yamaha	UW-500	Win, Mac	1/1	No	No	No	No	No	N/A	MIDI	20-bit A/D stereo record and playback, optical I/O, software suite	\$400
Yamaha	UX-16	Win, Mac	1/1	No	No	No	No	No	N/A	N/A	(2) status LED	\$50
Yamaha	UX-96	Win, Mac	1/1	No	No	No	No	No	N/A	MIDI	USB powered, to host serial port	\$90
Yamaha	UX-256	USB	6/6	Yes	No	No	No	No	N/A	N/A	Bundled patch-bay software for Mac and PC, self-powered	\$300

Miscellaneous Software

Manufacturer	Product	Version	Minimum System Requirements	Type	Special Features	List Price
AIPL	AIPL Singular	4	Win 95 or higher, Pentium 90 CPU, 16 MB RAM (32 for NT), 16 colors, 1 MB disk space	Audio recording software, make CDs, rip MP3s	Records albums, tapes, and DATs onto PC while auto-separating songs in real-time, stopping when done	\$29
AcousticX Software Corporation	AcousticX	N/A	Win 95, 98, 20 MB disk free space, 486 or higher	Room acoustics software	Speaker boundary interference, ray tracing, reverb time, modal response modules	\$400
Ahead Software	Nero 6 Ultra Edition	N/A	Win 95B, 98, 98SE, NT4, 2000, XP, ME, 300 MHz, 64 MB RAM	CD/DVD Burning Suite Software	Complete set of media tools for Audio, Data, Photo, Video, backup	\$99
Ahead Software AG	Feurio!	N/A	Win 95, 98, NT, 2000, ME, XP, Pentium 90, 16 MB RAM, hard-disk space: 8 MB	Audio CD recording software	Digital ripping of CDs, managing and editing of song files, burning the final CD, music database	\$29
APB Tools	TH-S	2.0	Mac OS 9, 256 MB	G3, G4	Multichannel cue/show playback system	\$2,190
Audio Ease	BarbaBatch	3.1	Mac OS 8.6	Batch sound file conversion	Sample rate converter	\$395
Automation Services Company, Inc.	SendKeys	1.0	Win 98SE, 2000, XP - see requirements for Cakewalk and Sonar	Utility for Sonar	Custom keyboard macros for Cakewalk and Sonar	\$15
Blaze Audio	MIDIMaster Karaoke	3.5	Win 9X, ME, 2000, XP	Karaoke and music education	Sing with MIDI karaoke files, record your voice, record duets	\$30
Cycling '74	Cyclops	1	Mac OS, 128 MB RAM	Video tracking		\$99
Cycling '74	Max	4.1	Mac OS, 128 MB RAM	Programming environment		\$295
Cycling '74	Jitter	1	Mac OS, 128 MB RAM	Video-processing software		\$395
Datasonics	VS Pro Score	5.5	Win 95, 98, ME, 2000, XP, 500 MHz, 96 MB RAM	Roland VS Workstation control	Includes MIDI Sequencer, notation, and digital audio	\$399
Datasonics	VS Pro Studio	5.5	Win 95, 98, ME, 2000, XP, 500 MHz, 96 MB RAM	Roland VS Workstation control	Includes MIDI Sequencer and digital audio	\$299
Datasonics	VS Pro ToolBox	5.5	Win 95, 98, ME, 2000, XP, 500 MHz, 96 MB RAM	Roland VS Workstation control	Audio Editor, Mix Editor, and FX Editor	\$199
Emersys	Maven Player	1.0	Win 9x/ME/NT/2000/XP, 166 MHz CPU, 16 MB RAM, 250 KB disk space	Multichannel Player	Free WAV and WAV extensible format player for up to 5.1 channels	Free
FMJ-Software	Awave Audio	8.3	Win 9X, ME, NT, 2000, XP	Audio-file format batch converter	Convert from the 60 available audio file formats, and read into 30 output formats	\$50
Gallery	VirtualVTR	4.0	Mac OS 9.1 QT 6, or OS X 10.2 QT 6	QuickTime-based VTR	Standalone video Deck based on QuickTime	\$799
Gallery	VirtualVTR Pro	4.0	Mac OS X 10.2 QT 6	Nonlinear video system	VirtualVTR, plus Video Streamer, Foley Control and more	\$1,495
Gallery	mTools	4.0	Mac OS 9.1, OS X 10.2 QT6	Sound-effects/music-management system	Networked large-scale Sound Effects library system	\$995
Gallery	VoicePro	3.0	Mac OS 9.2, OS X 10.2	Dialog recording system for multimedia	Batch, scripted Dialog recording system for large-scale multimedia, video games projects	\$895
Gallery	ADRStudio	2.0	Mac OS 9.1, OS X 10.2 (v 3.0)	ADR system for Pro Tools/Nuendo	Complete Dialog replacement system for Pro Tools and Nuendo (Nuendo support in v 3.0)	\$1,695
Gallery	SessionBrowser	3.0	Mac OS 9.2, OS X 10.2	Pro Tools session manipulation tool	Session contents browsing, media linking, session manipulation tools	\$549
Gallery	LibraryLoader	1.1	Mac OS X 10.2.4 QT6	Sound effects CD-ripping system	Batch ripping of all commercial SFX and production music CDs, with automatic names and descriptions	\$299
Gallery	MetaFlow	4.0	Mac OS 9.2, OS X 10.2	Film sound workflow management system	Automatic 24-bit reformatting, integration with location sound recorders, Avid Bins, etc.	\$1,995
Gig Logic, Inc.	Gigorama Soloflight	1.0	Win 95, 98, ME, XP, 64 MB RAM	Gig management	Book gigs, print contracts, song and set lists, financial summaries	\$70
Gig Logic, Inc.	Gigorama	1.0	Win 95, 98, ME, XP	Band management	Track gigs, create a virtual network that allow users to transfer gig stats to bandmates	\$90
Gig Logic, Inc.	Gigorama Virtual Network	1.0	Win 95, 98, ME, 64 MB RAM	Gig data-transfer portal	Allows band members and musicians to receive personal gig data from Gigorama Virtual Network users	Free
Gig Logic, Inc.	Gigorama Gig Importer	1.0	Win 95, 98, ME, 64 MB RAM	Bonus plug-in	Imports hundreds of clubs and venues into Gigorama software Clubs and Venues database	Free
Innovative Music Systems, Inc.	intelliScore Standard	5.1	Win XP/NT/ME/98/95/2000,	WAV to MIDI, MP3 to MIDI converter Pentium, 32 MB RAM	Helps transcribe monophonic audio files, compose MIDI in real-time by playing any instrument	\$59
Innovative Music Systems, Inc.	intelliScore Polyphonic	5.1	Win XP/NT/ME/98/95/2000,	WAV to MIDI, MP3 to MIDI converter Pentium, 32 MB RAM	Helps transcribe polyphonic audio files, compose MIDI in real-time by playing any instrument	\$79
Korg USA	Karma MW (for Korg Karma Music Workstation)	1.0	Win 98, ME, NT, XP 64 MB RAM, Pentium III/233 MHz, Power Mac OS 8.6-9.X, 604/166 MHz	Editor for the Karma algorithmic music function	Turn phrases and Triton arps into GEs, edit all 400+ GE parameters	\$150
Magix Entertainment Corporation	Magix Guitar Workshop 2nd Edition	N/A	Win 98/98SE/2000/ME/XP, 350 MHz, 64MB RAM, 150 MB free	Interactive education/training	16 tracks, virtual instruments, mixer, effects, loops, virt. metronome, beg-adv. video lessons	\$50
Magix Entertainment Corporation	Magix Piano & Keyboard Workshop 2nd Edition	N/A	Win 98/98SE/2000/ME/XP, 350 MHz, 64MB RAM, 150 MB free	Interactive training/education	Music composing/arranging, assessment, sheet music printing, song recording, progressive instruct.	\$50
Magix Entertainment Corporation	Soundpool DVD Collection 2004	N/A	Win or Mac (any system that supports WAV format)	Samples and sound loops	10,000 Exclusive Royalty-Free Samples, Professional 16-bit CD quality in 44.1 kHz	\$30
Mezzo Technologies	Mezzo Mirror	4.5	Mac (G3 min. recommended), OS 9 and higher (OS X required for CD/DVD-R support)	Backup, disk mirroring	Project-based disk mirroring supports Pro Tools, Digital Performer, background data transfer	\$299

Miscellaneous Software

Manufacturer	Product	Version	System Requirements	Type	Special Features	List Price
Mezzo Technologies	Mezzo for Digital Performer	4.5	Mac (G3 min. recommended), OS 9 and higher	Backup, archiving, asset management	Custom support of Digital Performer file format, background data transfers, online database	\$399
Mezzo Technologies	Mezzo for Pro Tools	4.5	Mac (G3 min. recommended), OS 9 and higher	Backup, archiving, asset management	Custom support of Pro Tools Session file format, background data transfers, online database	\$499
Micro Technology Unlimited	Microstudio	2.5	Win 98, 2000, XP, 128 MB, CD/RW, 350 mHz	Karaoke duplication software	Back up your CD+G discs, make custom compilations, and play them on your PC	\$40
Micro Technology Unlimited	Keyrite	1.302	Win 98, 2000, XP, 128 MB, 700 mHz	Key/pitch changing software	Change pitch of Karaoke CDG files and preserve the lyrics sync	\$40
Micro Technology Unlimited	Vogone	2.104	Win 98, 2000, XP, 128 MB, 700 mHz	Vocal reduction software	Process WAV files to reduce/remove vocals for Karaoke singing or audio recordings	\$55
Micro Technology Unlimited	Karaoke Pro	4.008	Win 98, 2000, XP, 128 MB, 350 mHz	Karaoke authoring software	Create Professional Karaoke CDG files by synching music and lyrics	\$90
Micro Technology Unlimited	Hoster	2	Win 2000, XP, 256 MB, 1GHz	Karaoke show hosting software for PC	Now you can host your Karaoke show from your computer or a MTU Laptop or Portable PC	\$299
Micromat Inc.	SoundMaker	1.0.3	Mac 7 - 9.2.2, 5 MB RAM	Sound editing	Create custom effects. Open, edit, save almost any sound format	\$70
Micromat Inc.	Drive 10	1.1.4	Mac OS X, 128 MB RAM, CD or DVD drive	Utilities	Utility program for Mac OS X, includes bootable OS X CD. Optimizes OS X drive.	\$70
Micromat Inc.	TechTool Pro	3.0.9	Mac 7 - 9.2.2, 5 MB RAM, CD or DVD drive	Utilities	Recovers lost data, repairs drive problems, recovers deleted files, over 300 tests. Bootable OS CD	\$100
Micromat Inc.	TechTool Pro 4	4.0.1	Mac OS 10.2 or greater, 128 MB RAM, CD or DVD drive	Utilities	Recovers lost data and deleted files, repairs drive problems, over 300 tests. Bootable OS X CD	\$100
MicroSound International Ltd.	Wow! Bach	N/A	Win 95, 98, 2000, ME, XP, 64 MB RAM	Interactive, reorchestration	6 Brandenburg Concertos with scores, includes 2 audio CDs	\$40
MicroSound International Ltd.	SuperConductor	N/A	Win 95, 98, 2000, ME, XP, Mac	Standalone software, synth, sequencer, sampler	Create, interpret, perform new and classical works	\$295
MicroSound International Ltd.	SuperConductor II	N/A	Win 98, 2000, ME, XP	Combined sequencer, synth, sampler	24-bit performance, expressive intonation tuning (EIT)	\$595
Molto Music	Musicians Online Practice Planner	N/A	Internet connection with Mac or Win	Performance management software	Database program available on Web site, keep practice logs and rosters online	\$75 and up
mSoft Inc.	MusicCue/Server Sound	3.0	Mac, Win	Digital asset management server	Server for SFX and Music Library with interface to any DAW. Over 12,000 CDs available - replaces CDs	\$4,995 and up
Music Manager Software	Master Music Manager	5.0	Mac, Win	Music library, administration	Comprehensive music library, membership, inventory, calendar, directory, recordings	\$400
Music Manager Software	WorshipManager	5.0	Mac, Win	Worship planning	References hymnals & song books - over 30 available	\$200
My Sheet Music	My Sheet Music	N/A	Win 95 or higher, Mac OS 7 or higher, internet connection	Performance software	Print sheet music in any key, for over 100 different instruments. Includes over 350 selections.	\$40
Ninelocks	MiniMIDI	3	PalmOS 3.1	Palm PDA	Normal MIDI and DMIDI network protocol support	\$10
QSound Labs	QTools/AX	2.04.001	Win 95 +	DirectX plug-in	Three separate DirectX plug-ins at www.qsound.com/products	\$80
Propellerhead Software	Reload	1.0	Win XP, Mac OS X	Program and sample conversion	Converts AKAI S1000 and S3000 formatted media into WAV/MIFF sample files and NN-XT patches	\$49
reFuse Software	reFuse	1.02	Mac OS 8.1 - 9.2	Utility	Audio and transport linking between Pro Tools and Reason or Ableton Live	\$29
SeerMusic Systems	ReMixer/WaveMaker	1.10	Win 9x, ME	SeerMusic and MIDI file playback, mixing application	Rendering to WAV or MP3, Web audio, sonification, synth/sampler engine as Reality	Freeware/\$19
Shubb Software	Gigmaster	4.5	Win 95 and up, 18 MB - power Mac 18 MB	Organizational database software for musicians	Gigbook performance list, financial reports, songbook database, contacts, and contracts	\$80
Sound Quest Inc.	SQ MIDI Tools	1	Win 95, 98, ME, NT, 2000, XP	MIDI Utilities	11 Programs, 30,000 patches, Drum Pattern Sequencer, MIDI Quest Jr. 6, MIDIXer, MIDIMapper	\$89
Sound Quest Inc.	Infinity	2	Win 95, 98, ME, NT, 2000, XP, 64 MB RAM	Audio and MIDI development tool	Create custom audio, MIDI and multimedia tools using 370+ different objects (standalone, VST, DX)	\$399
Sounds Logical	ReSample	1.1	Win 98, ME, NT, 2000	Batch WAV file sample rate conversion		\$30
SSoM Software	Music Admin Pro	3.3	Win 95 to XP, NT, Mac OS 8 to OS X	Administration software for music departments & schools	Handles all aspects of running a music dept, music school, or band program	\$595
Synchro Arts Ltd.	Titan	3.0	Mac OS		Essential functions to assist Auto Conforming	\$1,495
Synrise	Synrise - the Database	2003	Netscape 4.7 or Internet Explorer 6.0	Database	Database, but only available in German, all Synths and related products listed up to the end of 1999	\$20
Trillium Lane Labs	TL Metro	1.1	Mac	Digidesign Pro Tools utility	Metronome, 50 to 250 bpm, vols: 1/4, 1/8 1/16 notes, triplets/tap tempo, samples included	\$149
Trillium Lane Labs	TL InTune	1.2	Mac	Digidesign Pro Tools utility	Digital tuner, TDM plug-in, tuning fork, ships w/20 guitar type presets, add'l presets avail	\$149
Waldorf Music	Soundcorner	1.0	Win or Mac with internet access	Data bank	Intelligent sound data bank for Waldorf synthesizer	Free
WaveAccess-MindPeak	WaveRider Pro	2.5	Wintel 486	Brainwave-to-MIDI converter	Plays four channels of biological signals in the voices, keys and scales of your choice	\$1,700
WaveAccess-MindPeak	WaveRider Jr.	2.5	Wintel 486	Brainwave-to-MIDI converter	Plays two channels of biological signals in the voices, keys, and scales of your choice	\$950
Yeah! Solutions Ltd.	Music Publisher +	2.65	Win		Publishing/record company/film company/etc. administration	\$1,750 sgl user

Notation Software

Manufacturer	Product	Minimum System Requirements	Imported File Formats	Includes Fonts	Supports Alternative Fonts	Alternate Note Heads	Chord Symbols/Transposition/Auto-frets	Cross-staff/Cross-measure Beaming	Max # Staves/Voices per Staff/MIDI Channels per Staff	MIDI File Import/Export	MIDI Step Time Entry/Real-time Entry	Music Input via Mouse/Via Computer Keyboard	Non-standard Key Signatures
Adept Music Notation Solutions, Inc.	Nightingale Music Notation Software	Mac OS 7.0-9.2	MIDI, NoteScan, Notelist, Finale ETF (v.3, 3.5 only)	Yes	Yes	Yes	Y/Y/N	Y/Y	64/100/16	Y/Y	Y/Y	Y/Y	No
Adept Music Notation Solutions, Inc.	NightLight 2002 Music Notation Software	Mac OS 7.0, 5 MB RAM	MIDI, Notelist	Yes	Yes	Yes	Y/Y/N	Y/Y	9/100/9	Y/Y	Y/Y	Y/Y	No
Adept Music Notation Solutions, Inc.	Nightingale X	Mac OS X	MIDI, NoteScan, Notelist, Finale ETF (v.3, 3.5 only)	Yes	Yes	Yes	Y/Y/N	Y/Y	64/100/16	Y/Y	Y/Y	Y/Y	No
GenieSoft Music Software	Overture 3	Win or Mac (including OS X)	MIDI, Encore, and MusicTime	Yes	Yes	Yes	Y/Y/Y	Y/Y	64/8/8	Y/Y	N/Y	Y/Y	No
GenieSoft Music Software	Score Writer 2	Win or Mac (including OS X)	MIDI, Encore, and MusicTime	Yes	No	Yes	Y/Y/N	N/N	16/4/4	Y/Y	N/Y	Y/Y	No
Graphire Corporation	Music Press	Mac OS 7, 16 MB RAM, Win 95, 32 MB RAM	N/A	Yes	No	Yes	Y/Y/Y	Y/Y	Unlimited/4/1	N/Y	Y/N	Y/Y	No
MakeMusic!, Inc./Coda Music Technologies	Finale 2004	Mac 9.0.4, Win 98, 64MB RAM	MIDI, Encore, TIFF, EPS, SCORE, Rhapsody, SharpEye, SmartScore, MIDIScan, MusicXML, Finale Family	Yes	Yes	Yes	Y/Y/Y	Y/Y	Unlimited/8/6	Y/Y	Y/Y	Y/Y	Yes
MakeMusic!, Inc./Coda Music Technologies	Finale Guitar	Mac 8.6, Win 98, 64 MB RAM	MIDI, SmartScore, Encore, Rhapsody, MIDIScan, Finale Family Files	Yes	Yes	Yes	Y/Y/Y	N/N	32/8/6	Y/Y	Y/Y	Y/Y	No
MakeMusic!, Inc./Coda Music Technologies	PrintMusic!	Mac 8.6, Win 98, 64 MB RAM	MIDI, SmartScore, Encore, Rhapsody, MIDIScan, Finale Family Files	Yes	No	No	Y/Y/Y	N/N	24/8/6	Y/Y	Y/Y	Y/Y	No
MakeMusic!, Inc./Coda Music Technologies	NotePad Plus	Mac 8.6, Win 98	MIDI, all same or earlier version Finale Family Files	Yes	No	No	N/Y/N	N/N	8/8/1	Y/Y	N/N	Y/N	No
MakeMusic!, Inc./Coda Music Technologies	Finale NotePad	Mac 8.6, Win 98	All same or earlier version Finale Family Files	Yes	No	No	N/Y/N	N/N	8/4/1	N/N	N/N	Y/N	No
miniMusic	NotePad	Palm OS 3.0 and higher, 100 K free	N/A	No	No	No	N/Y/N	N/N	2/4/4	N/Y	N/N	N/Y	No
Musitek	SmartScore Pro	Win 9x, NT, ME, 2000, XP, 24 MB RAM	TIFF, MIDI, ENF, NIFF	Yes	No	No	Y/Y/N	Y/N	32/4/4	Y/Y	Y/Y	Y/Y	Yes
Musitek	SmartScore Songbook Edition	Win 9x, NT, ME, 2000, XP, 24 MB RAM	TIFF, MIDI, ENF, NIFF	Yes	No	No	Y/Y/N	Y/N	3/4/4	Y/Y	Y/Y	Y/Y	Yes
Musitek	SmartScore MIDI Edition	Win 9x, NT, ME, 2000, XP, 24 MB RAM	TIFF, MIDI, ENF, NIFF	Yes	No	No	N/Y/N	Y/N	4/4/4	Y/Y	Y/Y	Y/Y	Yes
Musitek	SmartScore Piano Edition	Win 9x, NT, ME, 2000, XP, 24 MB RAM	TIFF, MIDI, ENF, NIFF	Yes	No	No	N/Y/N	Y/N	2/4/4	Y/Y	Y/Y	Y/Y	Yes
Musitek	SmartScore Guitar Edition	Win 9x, NT, ME, 2000, XP, 24 MB RAM	TIFF, MIDI, ENF, NIFF	Yes	No	No	Y/Y/N	Y/N	1/4/4	Y/Y	Y/Y	Y/N/A	Yes
Notation Technologies	Play Music	Win 95, 98, 2000, ME, XP, 16 MB RAM	MIDI, MusicTime, Rhapsody, Encore	Yes	Yes	Yes	Y/Y/Y	Y/Y	24/8/8	Y/Y	Y/Y	Y/Y	Yes
Personal Composer, Inc.	Personal Composer 44	Win 95 - XP	MIDI, NIFF	Yes	Yes	Yes	Y/Y/N	Y/N	44/4/1	Y/Y	Y/Y	Y/Y	No
Personal Composer, Inc.	PC-16	Win 95 - XP, 64 MB RAM	MIDI, NIFF	Yes	Yes	Yes	Y/Y/N	Y/N	16/4/1	Y/Y	Y/Y	Y/Y	No
Personal Composer, Inc.	PC-8	Win 95 - XP, 64 MB RAM	MIDI	Yes	Yes	Yes	Y/Y/N	N/A	8/4/1	Y/Y	Y/Y	Y/Y	No
Sibelius Software	Sibelius	Win 95, 98, Me, 2000, XP, NT4, Mac G4/G3/iMac, OS 8.6	Finale, Score, Allegro, Printmusic, MIDI, TIFF	Yes	Yes	Yes	Y/Y/Y	Y/Y	Unlimited/4/1	Y/N	N/A/Y	Y/Y	Yes
Yowza Software	MusEdit Music Notation Software	Win 95, 98, ME, NT, 2000, XP, 32 MB RAM	MusEdit, text, MIDI, ABC	Yes	No	Yes	Y/Y/Y	N/N	20/4/20	Y/Y	Y/Y	Y/Y	Yes

Complex Meters/ Non-metric Music	Parts Dynamical- ly Linked to Score	Rhythmic Range	Tuplet Range	Scanning/OCR	Single-line Percus- sion Staff	Tablature/User- definable	Tablature Converts To/From Standard Notation	Text: Lyrics/Headers & Footers/Annotative	Transposition	Special Features	List Price
Y/Y	No	128th note to double whole note	Unlimited	Y/N	Yes	Y/Y	N/N	Y/Y/Y	Chromatic, diatonic, enharmonic	QuickChange and Get Info interfaces, Threader Tool, NoteScan Program (\$29)	\$200
Y/Y	No	128th note to double whole note	Unlimited	N/N	Yes	Y/Y	N/N	Y/N/Y	Chromatic, diatonic, enharmonic	QuickChange and Get Info interfaces, Threader Tool, four-page maximum	Free
Y/Y	No	128th note to double whole note	Unlimited	Y/N	Yes	Y/Y	N/N	Y/Y/Y	Chromatic, diatonic, enharmonic	QuickChange and Get Info interfaces, Threader Tool, NoteScan Program (\$29)	\$289
Y/Y	No	128th note to double whole note	(2-99) including nested tuplets	N/N	Yes	Y/Y	N/Y	Y/Y/Y	Chromatic, diatonic, enharmonic	Full graphical editing of all MIDI data in Graphic Window	\$349
N/N	No	128th note to double whole note	(2-99)	N/N	No	N/N	N/N	Y/Y/Y	Chromatic, diatonic, enharmonic	Opens Overture 3 files. Scores are cross-platform compatible.	\$59
Y/Y	No	128th note to double whole note	Unlimited	N/N	Yes	N/Y	N/Y	Y/Y/Y	Chromatic, diatonic, enharmonic	High-end printing features	\$600
Y/Y	No	128th note to double whole note	Unlimited	Y/N	Yes	Y/Y	Y/Y	Y/Y/Y	All	Save as audio file, exercise wizard, auto-harmonize, instant orchestration, rhythm-section generator	\$300/ \$600
N/Y	No	128th note to double whole note	128th note to double whole note	Y/N	Yes	Y/Y	Y/Y	Y/Y/Y	All	Exports as TIFF, MicNotator, Rhyming Dictionary, SmartMusic Accompaniment	\$100
N/N	No	128th note to double whole note	128th note to double whole note: unlimited nesting	Y/N	Yes	N/N	N/N	Y/Y/Y	All	Engraver slurs, MicNotator (real-time entry from acoustic inst.), exports as SmartMusic Accompaniment	\$70
N/N	No	32nd note to whole note	32nd note to whole note: 3 nested layers	N/N	Yes	N/N	N/N	Y/Y/Y	Key signature only	Exports as SmartMusic Accompaniment	\$10
N/N	No	32nd note to whole note	33rd note to whole note: 3 nested layers	N/N	Yes	N/N	N/N	Y/Y/Y	Key signature only	Opens any same or earlier version Finale Family File, exports as SmartMusic Accompaniment	Free
N/N	No	16th-triplet note to whole note	Triplet only	N/N	No	N/N	N/N	N/N/N	Chromatic	Pen-based input and editing on handheld computers	\$30
N/N	Yes	128th note to double whole note	6 presets plus user-defined	Y/Y	Yes	N/N	N/N	Y/Y/Y	Chromatic, diatonic, enharmonic	Exports scanned music to Finale import format (FIN)	\$400
N/N	Yes	128th note to double whole note	6 presets plus user-defined	Y/Y	Yes	N/N	N/N	Y/Y/Y	Chromatic, diatonic, enharmonic	Exports formatted pages to Finale- readable format (FIN)	\$200
N/N	Yes	128th note to double whole note	6 presets plus user-defined	Y/N	Yes	N/N	N/A	N/Y/N	Chromatic, diatonic, enharmonic		\$100
N/N	Yes	128th note to double whole note	6 presets plus user-defined	Y/N	Yes	N/N	N/A	N/Y/N	Chromatic, diatonic, enharmonic		\$100
N/N	Yes	128th note to double whole note	6 presets plus user-defined	Y/N	Yes	N/N	N/A	N/Y/N	Chromatic, diatonic, enharmonic		\$100
Y/Y	Yes	128th note	Yes	N/N	Yes	Y/Y	N/N	Y/Y/Y	All		\$50
N/N	No	128th note to double whole note	15 X	N/N	Yes	Y/N	N/N	Y/Y/Y	Chromatic, enharmonic, diatonic, modal	Imports/exports graphics, imports NIFF	\$200
N/N	No	128th note to double whole note	15 X	N/N	Yes	Y/N	N/N	Y/Y/Y	Chromatic, diatonic, enharmonic		\$140
N/N	No	128th note to double whole note		N/N	Yes	Y/N	N/N	Y/Y/Y	Chromatic, diatonic, enharmonic		\$70
Y/Y	No	512th note to 'Longa'	Unlimited	Y/Y	Yes	Y/Y	Y/Y	Y/Y/Y	All	Internet publishing, enhanced playback, OS X carbonized, auto-arrange, Flexitime note entry	\$299/ \$599
Y/Y	No	64th note to double whole note	Unlimited	N/N	Yes	Y/Y	Y/Y	Y/Y/Y	Chromatic	Image export, custom chord diagrams, alternate tunings, 284 pg. printed manual	\$79

Sequencers

Manufacturer	Program	Platform	Simultaneous MIDI Tracks	Maximum Clock Resolution (ppqn)	Quantization Types	Sequencing Method	Editing Views	Graphic Faders	SysEx Editing	Looping
Cakewalk	Guitar Tracks Pro	Win 98/SE/ME/2000/XP	N/A	N/A	N/A	Linear audio recording	Audio edit, mixer	Up to 42	No	Region, sequence
Cakewalk	Home Studio 2004	Win 98/SE/ME/2000/XP	Unlimited	960	Groove, swing by %, tick offset	Linear, pattern	Piano roll, SysEx, event, notation, console, studioware, tempo, markers	Unlimited	Yes	Yes
Cakewalk	Plasma	Win 98/SE/ME/2000/XP	Unlimited	960	Groove, swing by %, tick offset	Linear, pattern	Piano roll, track, loop explorer, loop editor event, console, big time, video, temp	Unlimited	No	Region, groove clips
Cakewalk	Sonar Producer Edition	Win 2000/XP	Unlimited	960	Groove, swing by %, offset, randomize	Linear	Piano roll, event list, staff, drum editor, controller, console loop construction, loop explore	Unlimited	Yes	Yes
Cakewalk	Sonar 3 Studio	Win 2000/XP	Unlimited	960	Groove, swing by %, offset, randomize	Linear	Piano roll, event list, staff, drum editor, controller, console loop construction, loop explore	Unlimited	No	Yes
Emagic	Logic Audio 6	Mac OS 9, OS X	Unlimited	960	Swing by %	Linear	Event list, matrix, hyper, score	Unlimited	No	Region, sequence
Emagic	Logic Gold 6	Mac OS 9, OS X	Unlimited	960	Groove templates, swing by %	Linear	Event list, score, matrix, hyper, transform	Unlimited	Yes	Region, sequence
Emagic	Logic Platinum 6	Mac OS 9, OS X	Unlimited	960	Groove templates, swing by %, extended quantize parameters	Linear	Event list, score, matrix, hyper, transform	Unlimited	Yes	Region, sequence
Emagic	MicroLogic AV 4.7	Mac, Win 98/ME/2000/XP	Unlimited	960	Normal, swing	Linear	List, score, matrix	Yes	No	Yes
FASoft	n-Track Studio 3.3	Win 95/98/NT/ME/2000/XP	Unlimited	1,920	Grid, swing, randomize	Linear	Timeline, piano roll, events list	Yes	Yes	Yes
Future Retro	Mobius	Hardware	1	16th note	Up to 16th note	Loop-based step	N/A	No	Yes	Yes
Howling Dog Systems	Power Chords Pro	Win 3.1/9x/NT/2000/XP	N/A	96	Strum, humanize, roll/pick, quantize	Pattern, loop	Piano roll	No	No	Yes
Image-Line Software	FL Studio 4.12	Windows 95/98/ME/2000/XP	Unlimited	768	All + custom	Linear, step and pattern based	Piano roll, track view and event view	Unlimited	No	Yes
Midisoft	Studio Recording Session	Win 95-XP	Unlimited	1,000	Percentage	Linear	Notation, MIDI list	Yes	Yes	No
Mil Productions	Modularing	Mac OS X	Unlimited	999	Real-time steps shifting	All	Analog, matrix, pad, controllers	Unlimited	Yes	Yes
miniMusic	BeatPad	Palm OS 3.0 and higher	12	24	N/A	Pattern	Melodic, drum	No	No	Yes
MOTU	Digital Performer 4.0	Mac	Unlimited	Configurable	Input, output, swing, groove, humanize	Linear, pattern	Track overview, graphic, drum editor, event list, notation	Yes	Yes	Yes
MOTU	FreeStyle 2.3	Mac, Win	Trackless	960	Straight, offset	Linear, loop event list	Piano roll, notation	No	Yes	Yes
MOTU	Performer 6	Mac	Unlimited	480	Input, output, swing, groove, humanize, GrooveEditor	Linear, pattern, chunk	Graphic, event list, notation	Yes	Yes	Yes
Musicator	Musicator Win 4.0	Win 95/98/ME/NT/2000/2002/XP	255	480	Swing, percentage	Linear	Track/passage/bar, roll view, notation, audio, effects	Yes	Yes	Yes
Personal Composer	Personal Composer	Win	8, 16, 44	1,024	Note-on, note-off	Linear	Page, scroll, split-screen	Yes	No	No
PG Music	PowerTracks Pro Audio	Win 9x/NT/2000/2002/XP	48	960	Swing, percentage, randomize	Linear, step	Tracks, audio, mixer, events, bars, roll notation, SysEx editor	Yes	Yes	Yes
Roland	MC-50mkII	Roland S-MRC	8 (32 ch)	96	Grid	Linear, step	Track, event	No	Yes	Yes

# of Audio Tracks	Integrated MIDI/Audio Edit Screen	Audio Effects	Dynamics Processing	Time Compression and Expansion	Pitch-Shift Type	Sample-Rate Conversion	DSP Plug-In Formats	Audio-to-MIDI Conversion	Extract Timing from Audio	Special Features	Generates Time Code	Synchs to Incoming Time Code	List Price
32	Yes	Amp sim, chorus, delay, flanger, dyn proc, lim, EQ, pitch shifter, reverb	Yes	No	Formant preserving	Yes	DirectX	No	No	Import ACID wave files, Revalver SE amp simulator, delay time calc, tuner, support for multi-I/O	No	No	\$139
Unlimited	Yes	Reverb, chorus, flange, delay, parametric EQ	Yes	Yes	Yes	No	DirectX, DXi 2.0	No	No	24-bit/96 kHz support, ReWire 2.0, ASIO hardware support, multiport drum grid editing	No	No	\$129
Unlimited	Yes	Effects pad, parametric EQ, pitch shift, delay, reverb, flange, chorus	Yes	Yes	Yes	Yes	DirectX, DXi	No	No	AUI, slip editing, ACID file support	No	No	\$49
Unlimited	Yes	EQ, amp sim, chorus, delay, flanger, tape sim, EQ, reverb, parametric EQ, pitch shifter, time	Yes	Yes	Formant preserving, traditional	Yes	DirectX, DXi, VST, VSTi, MFX	No	Yes	Integrated channel EQ, Universal Bus Architecture, Lexicon LexiVerb, V Sampler 3.0, Sonitus fx suite	Yes	Yes	\$499
Unlimited	Yes	EQ, amp sim, chorus, delay, flanger, tape sim, EQ, reverb, parametric EQ, pitch shifter, time	Yes	Yes	Formant preserving, traditional	Yes	DirectX, DXi, VST, VSTi, MFX	No	Yes	Universal Bus Architecture, Lexicon LexiVerb, input monitoring	Yes	Yes	\$299
48 stereo	Yes	28 real-time effects	Yes	Yes	Traditional	Yes	VST (OS 9), AU (OS X)	No	No	3-step undo/redo, track based automation, 8 stereo busses, integrated stereo sample editor	Yes	Yes	\$399
64 stereo	Yes	42 real-time effects	Yes	Yes	Formant preserving, traditional	Yes	VST (OS 9), AU (OS X)	Yes	Yes	30-step undo/redo, track based automation, 16 stereo busses, integrated stereo sample editor	Yes	Yes	\$649
255 stereo	Yes	Over 50 real-time effects, 3 included virtual synths	Yes	Yes	Formant preserving, traditional	Yes	TDM, VST (OS 9), AU (OS X)	Yes	Yes	Unlimited undo/redo, freeze tracks, advanced automation, open TL, OMF support	Yes	Yes	\$949
16	Yes	9 native plug-ins	Yes	No	N/A	Yes	ASIO	No	No	ASIO 2.0, WDM, MME, ReWire, spectrum analyzer	Yes	Yes	\$99
Unlimited	Yes	Reverb, echo, pitch shift, chorus, EQ	No	Yes	Formant preserving	Yes	DirectX, VST, DXi, VSTi	No	No	Works with WDM and ASIO drivers, spectrum analyzer	Yes	Yes	\$45
0	No	N/A	No	No	N/A	No	N/A	No	No	Copy/paste pattern shifting; real-time pattern editing, MIDI to control voltage conversion			\$325
20	No	N/A	No	No	N/A	No	N/A	No	No	Configurable stringed instrument interface, chord+plucking/strumming pattern	No	No	\$60
Unlimited	Yes	30+ effects included	Yes	No	Linear, sync 64-256	Yes	VSTi, DXi, Buzz	No	Yes	Internal controllers, integrated speech & guitar synth	No	No	\$49-\$149
8	No	Delay, echo, chorus, flanger, EQ	Yes	No	Traditional	Yes	N/A	No	No	Multisequence playback, articulation marks, more	Yes	Yes	\$60
2	No	Reverb, delay, echo, chorus, saturator	No	No	N/A	No	Standalone software	No	No	Integrated synthesizers	Yes	Yes	\$TBA
0	No	N/A	No	No	N/A	No	N/A	No	No	Pen-based editing	Yes	No	\$30
Unlimited	Yes	50+ native MIDI and audioplug-ins	Yes	Yes	Formant preserving, traditional	Yes	TDM, MAS, Premiere	No	No	Supports Mac OS X CoreAudio/CoreMIDI, Mackie control surface, 3rd-party plug-ins, software inst	Yes	Yes	\$795
0	No	N/A	No	No	N/A	No	N/A	No	No	Sense tempo, note-spelling algorithms, step sequencing	No	No	\$195
Up to 8	Yes	EQ, dyn, chorus, flanger, delay, phase shifter, autopan, echo, trml	Yes	No	N/A	No	MAS	No	No	QuickTime support, Unisyn, custom consoles for Roland VS-880, window sets, WYSIWYG notation editing	Yes	Yes	\$495
32	Yes	N/A	No	No	N/A	Yes	N/A	No	No	Notation, front-panel controls for GS, XG, SC-88 Pro FX	No	No	\$299
0	No	N/A	No	No	N/A	No	N/A	No	No	Transpose, copy to WP and DTP apps	No	No	\$70-\$200
Up to 48	Yes	Comp, gate, dist, reverb, echo, chorus, flanger, ring mod, trem, tone, EQ, exciter	Yes	No	Traditional	Yes	Proprietary, DirectX	No	No	Detect chords from MIDI file, export to WMA and MP3, CD-RW software, guitar tuner	No	No	\$49
0	No	N/A	No	No	N/A	No	N/A	No	No	2 MIDI outs, 1.4 MB floppy drive, read/write, mid	Yes	Yes	\$795

Sequencers

Manufacturer	Program	Platform	Simultaneous MIDI Tracks	Maximum Clock Resolution (ppm)	Quantization Types	Sequencing Method	Editing Views	Graphic Faders	SysEx Editing	Looping
Steinberg	Cubase SL	Win 2000/XP, Mac OS X	Unlimited	Sample-level	N/A	Linear, loop	Key, drum, list, SysEx, score, logical, loop	Unlimited	Yes	Yes
Steinberg	Cubase SX 2.0	Win 2000/XP, Mac OS X	Unlimited	Sample-level	Auto, custom, swing, groove	Linear, loop	Key, piano roll, list, drum, logical, sample, part, loop, score	Unlimited	Yes	Yes
Steinberg	Cubase SE (Studio Case)	Win 2000, XP, Mac OS X 10.2	Unlimited	Sub-sample	Groove, soft	Linear, loop, overdub, step, punch	Key, list, drum, score,	Unlimited	No	Yes
Synapse Audio	Orion Platinum	Win 98/ME/2000/XP	128	768	Shuffle, groove, humanize	Pattern, step	Piano roll, song arrangement, pattern events, song events	128	No	Yes
Technosaurus	Cyclodon	Hardware 16 step sequencer	N/A	N/A	N/A	16 step	N/A	No	No	Yes
WinJammer	WinJammer Pro 5.0	Win 3.1/95/NT	256	960	Swing, groove, input, variable strength	Linear	Piano roll, event list, score, drum view	Yes	Yes	Yes
Yamaha	QY 100	Hardware	24	480	Percentage, swing	Linear, pattern	Event list	16	Yes	Pattern section
Yamaha	QY 700	Hardware	48	480	Percentage, swing, groove templates	Linear, pattern	Piano roll, event list	48	Yes	Track, pattern
Yamaha	RM1x	Hardware	16	480	Grid, percentage, groove templates	Step, real, pattern, linear	Event, track, pattern chain	Yes	Yes	Yes
Yamaha	RS 7000	Hardware	16	480	Percentage, swing, groove grid	Linear, pattern	Event list	16	Yes	Pattern section
Yamaha	XGworks 3.0	PC	100	480	Strength, sensitivity, swing, gate, velocity	Step, real, pattern, linear	Track view, piano roll, staff, drum, event list	Yes	Yes	Yes

● CLOSING THE LOOP *continued from page 36*

the currently selected Warp marker will shift as the current Warp marker is moved.

Live Warp and Grid markers really come into play with files that contain tempo changes or unsteady playing. You can use Warp markers to fine-tune the groove or to completely disrupt the time flow. Ableton founder and CEO Gerhard Behles says Warp markers were designed to align song-length audio files to the session beat but are often used for other purposes, "like moving beats back and forth in time, by milliseconds or note intervals. We have been surprised by how frequently this method is used," says Behles.

PICK YOUR FLAVOR

Acid and Live (version 2) both can optimize the slicing process according to the type of audio. That can have a tremendous impact on the sound quality of the sliced loop.

In Acid, go into the Stretch tab in the Track Properties display:

- Click on the Stretching Method pull-down menu to select the type of audio you'll be working with.
- Select Looping Segments when slicing drum tracks or other nonsustaining audio.
- Choose Nonlooping Segments for sustained phrases, including synth "pads."

- Use Pitch Shift Segments to decrease artifacts or distortion that can be caused by pitch-shifting or extreme tempo changes.

In Live 2, check out the Mode menu, which you will find in the Warp section of the Clip view:

- The Beats setting is the default and is best for drum or percussion loops.
- The Tones setting is for bass lines, singing, and other monophonic melodies.
- The Texture setting works well on polyphonic orchestral or band recordings in addition to pads and noisy textures.
- The Re-Pitch mod stretches both

# of Audio Tracks	Integrated MIDI/Audio Edit Screen	Audio Effects	Dynamics Processing	Time Compression and Expansion	Pitch Shift Type	Sample-Rate Conversion	DSP Plug-In Formats	Audio-to-MIDI Conversion	Extract Timing from Audio	Special Features	Generates Time Code	Synchs to Incoming Time Code	List Price
Unlimited	Yes	Many	Yes	Yes	Traditional	Yes	VST, DXi	No	Yes	VST system link, video track, Rewire 2, CD grabbing, video track, unlimited undo/redo	Yes	Yes	\$499
200+	Yes	Delays, dynamics, de-esser, over-drive, quadra fuzz, flange, phase, rotary, chorus, symphonic, reverb	No	Yes	Yes	Yes	VST, DirectX	No	Yes	Surround sound, unlimited undo/redo, VST system link technology, video track with thumbnail	Yes	Yes	\$799
48	Yes	Reverbs, delays, chorus, flange, more	Yes	Yes	Traditional	Yes	VST, DirectX	No	No	Special bundle includes Virtual Guitarist SE, The Grand SE, Groove Agent SE, D'Cota SE, HALion SE	No	Yes	\$299
128	Yes	Delay, reverb, dynamics, EQ, distortion, chorus, flanger, phaser, misc.	Yes	Yes	Traditional	Yes	DX, VST	No	Yes	Groove Slicer, Genetics, Chord & Groove Templates, Event Editing Tools, MultiFX Control	No	No	\$199
0	No	N/A	No	No	Knobs	No	N/A	No	No	Analog 16-step sequencer	No	No	\$329
0	No	N/A	No	No	N/A	No	N/A	No	No		Yes	Yes	\$200
0	No	Hardware, reverb, chorus, variations	No	No	N/A	No	N/A	No	No	A/D input with effects for guitar and microphone	No	No	\$630
0	No	Processors, effects	No	No	N/A	No	N/A	No	No	XG tone generator, phrase database, FDD 2 MIDI outs, pitch and modulation	Yes	Yes	\$1,495
0	No	Reverb, chorus, variations	Yes	Yes	Normal	No	N/A	No	No	654 normal voices, 46 drum kits, 3.5 FDD, SMF compatible, 8 real-time control knobs with 16 parameters	No	No	\$900
16	Yes	Hardware, reverb, delay/chorus, variations, master	No	Yes	Intelligent Slice Type X	Yes	N/A	Yes	No	Integrated sampling sequencer, AIEB2 output expander, SIMMs expansion	No	No	\$1,695
6 stereo	Yes	Hardware dependent	Yes	Yes	Normal	Yes	Proprietary (hardware)	Yes	Yes	Guitar arranger, auto arranger, XG editor, Voice to score, multiple notation formats	No	No	\$100

time and pitch, much like changing the speed on a turntable or tape deck.

• Live Tones and Texture modes have a Grain size setting instead of the Transient parameter. Grain is a type of resolution control, and it determines the size of the data-stream window that is to be processed. Ableton recommends using a smaller Grain setting on monophonic pitched passages and a larger window on complex polyphonic passages; the default values make good starting points. The Texture mode also includes a Flux value that adds a bit of randomization to the result; modest amounts can be beneficial when stretching complex passages.

As Ableton's Behles says, "By choosing the right stretching methods and setting the respective parameters, you will get very good quality even for heavy stretch factors."

CLOSING THE LOOP

To recap, remember to avoid placing slice markers or edits inside the body of a note, and always cut immediately before the attack.

For pitched, melodic loops, use larger grid settings such as eighth or quarter notes. Make sure that you know how to adjust transient-detection sensitivity and how to add, move, or remove slices by hand.

Acquaint yourself with advanced controls such as Acid's Stretching Methods and Live's Warp modes. Utilize these optimization features anytime that you are slicing a pitched or a melodic part.

Start using these simple techniques and you'll be well on your way to having great-sounding sliced loops.

Todd Souvignier is the author of *The Musician's Guide to the Internet, 2nd ed.* (Hal Leonard, 2002), and the forthcoming *Loops & Grooves: The Musician's Guide to Groove Machines and Loop Sequencers* (Hal Leonard, 2003). Visit Todd online at <http://souvignier.net>.

Signal-Processing Software

Manufacturer	Product	Version	Processor Type	Minimum System Requirements	Format and Platform	Automation	Operates in Real-time	Special Features	List Price
4Front Technologies	OSS/3D	5.5	Spatialization, bass boost, reverb, exciter, DVD mixdown	Win, Intel P3 or higher, 64 MB RAM	DirectSound, Winamp, WMP 9, MusicMatch	Yes	Yes	Spatialization, bass boost, reverb, exciter, DVD mixdown, surround-sound emulation	\$12
AIPL	AIPL WarmTone, Standard	2.2	Dynamics processor	Win 95, Pentium 90 CPU, 16 MB RAM, 256 colors, 1 MB disk space	DirectX	No	No	Add 24-bit analog warmth & compression to PC digital audio, fully functional try-before-you-buy	\$34
AIPL	AIPL SpinCycle, Standard	2.1	Dynamics processor	Win 95, Pentium 120 CPU, 16 MB RAM, 1 MB disk space	DirectX	No	No	Add 24-bit rotary speaker sound to PC digital audio, fully functional try-before-you-buy software	\$49
AIPL	AIPL WarmTone, Pro	2.2	Dynamics processor	Win 95 or higher, Pentium 90 CPU, 16 MB RAM, 256 colors, 1 MB disk space	DirectX	No	No	Add 24-bit analog warmth and compression to your digital audio. Pro eliminates digital by-products	\$64
AIPL	AIPL SpinCycle, Pro	2.1	Dynamics processor	Win 95, Pentium 120 CPU, 16 MB RAM, 256 colors, 1 MB disk space	DirectX	No	No	Add big 24-bit rotary speaker sound to your PC digital audio. Pro eliminates digital by-products	\$79
Antares Audio Technologies	Auto-Tune 3	N/A	Intonation processor	Computer compatible with host application	RTAS (Mac OS X/PC), VST (Mac OS X/PC), MAS, TDM (Mac OS X), DX	Yes	Yes	Pitch correction	\$299-\$599
Antares Audio Technologies	Mic Modeler	N/A	Modeling	Mac OS 8.6, Win 9x or higher	DX, RTAS (Mac OS X), VST (Mac), MAS, TDM (Mac OS X)	Yes	Yes	Makes input microphone sound like rare or expensive microphone	\$399-\$599
Antares Audio Technologies	Tube	1.0	Tube emulator	Mac OS 9x, Win 98	DX, MAS, VST (Mac OS X/PC), RTAS (Mac OS X/PC)	Yes	Yes	Choose between a clean "blue tube" or a distorted, glowing "orange tube"	\$129
Anwida Soft	DX Reverb	2.0	Reverb	200 MHz Pentium CPU, 32 MB RAM, Win 9x/ME/NT4/2000/XP	DirectX	Yes	Yes	2 small rooms, 2 medium rooms, 2 large rooms/halls, 2 plate reverbs, 2 gate rev, 1 inverse rev	\$149
Anwida Soft	DX Reverb Light	2.0	Reverb	200 MHz Pentium CPU, 16 MB RAM, Win 9x/ME/NT4/2000/XP	DirectX	No	Yes		Free
Anwida Soft	DX Modulation Pack	2.0	Phaser, flanger, chorus, tremolo, c delay, HP/LP filter	200 MHz Pentium CPU, 32 MB RAM, Win 9x/ME/NT4/2000/XP	DirectX	Yes	Yes	Full MIDI support, built-in preset manager, the value of control parameters can be inserted manually	\$99
Anwida Soft	CX1V	1.1	Compressor/expander	200 MHz Pentium CPU/PowerMac G3/300 MHz, 32MB RAM, Win 9x/ME/NT4/2000/XP, Mac OS X	VST	Yes	Yes	Look ahead, hard/soft knee, above threshold monitoring	\$69
Anwida Soft	GEO15V	1.1	15-band 2/3-octave graphic equalizer	200 MHz Pentium CPU/PowerMac G3/300 MHz, 32MB RAM, Win 9x/ME/NT4/2000/XP, Mac OS X	VST	Yes	Yes		\$49
Anwida Soft	GEO31V	1.1	31-band 1/3-octave graphic equalizer	200 MHz Pentium CPU/PowerMac G3/300 MHz, 32MB RAM, Win 9x/ME/NT4/2000/XP, Mac OS X	VST	Yes	Yes		\$69
Anwida Soft	Graphic Equalizer Pro	2.2	Stereo 15-band 2/3-octave graphic equalizer	166 MHz Pentium CPU, 16MB RAM, Win 9x/Me/NT4/2000/XP	Standalone, PC, Win	No	Yes	Real-time processing of sound-card inputs, off-line and real-time processing of WAV files	\$40
Anwida Soft	L1V	1.1	Limiter/maximizer	200 MHz Pentium CPU/PowerMac G3/300 MHz, 32MB RAM, Win 9x/ME/NT4/2000/XP, Mac OS X	VST	Yes	Yes	Look ahead, hard/soft knee, above threshold monitoring	\$59
Audio Ease	Altverb	3	Reverb	Mac G4, OS 9 - OS X, 40 MB free	MAS, VST, RTAS, Audio Unit	Yes	Yes	Sampled acoustics processor	\$495
Audio Ease	Altverb HTDM	3	Reverb	Mac G4 733MHz, OS 9 - OS X, 40 MB Free	HTDM, RTAS, MAS, VST, Audio Unit	Yes	Yes	Sampled acoustics processor	\$795
Audio Ease	Nautilus Bundle	1	Exotic effects	Mac OS 8.6, 10MB free	MAS	Yes	Yes	Sound-sculpting tools	\$299
Audio Ease	Rocket Science Bundle	2	Room simulation, vover filter	Mac OS 8.6, 5MB free	MAS	Yes	Yes	2-D sound positioning, talking filter, envelope follower	\$199
BIAS Inc.	Vbox	1.3	Multi-effects control environment for VST plug-ins	Mac OS 8.6/9 & OS X 10.1/10.2, 64 MB, Win 95 or higher, 64 MB	Standalone and VST plug-in	No	Yes	Combine, route, and mix hundreds of plug-ins per channel, audio file, or live feed	\$99
BIAS Inc.	SuperFreq	1.1	Scalable 10-band paragrahic equalizer	Mac OS 8.6/9 & OS X 10.1/10.2	VST	No	Yes	Optionally, SuperFreq can be launched as a 4, 6, 8, or 10-band paragrahic EQ	\$79

The PowerCore DSP Platform by TC... It stands alone.



When we decided to bring our processing tools into the world of Digital Audio Workstations, we realized we couldn't rely on native systems to provide the horsepower our products would need. That was the beginning of the PowerCore platform – an open DSP-backbone that takes the load off your computer's CPU and runs the most intense TC and 3rd party processing algorithms.

Today, PowerCore stands alone as the world's only cross-platform and cross-application DSP engine with a choice of PCI and Firewire solutions. PowerCore includes ten world-class quality TC plug-ins right out of the box. What's more, you can add great optional tools from TC and a growing number of respected 3rd party developers such as Sony Oxford, TC-Helicon, Waldorf, D-Sound, ...

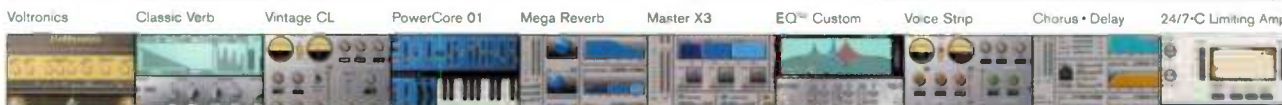


THE POWERCORE PLATFORM

PowerCore is the open platform DSP engine for professional signal processing on Mac and PC. Serious processing power that seamlessly integrates with any Audio Units- or VST-compatible host application. Available as PCI-card or external FireWire version.



PowerCore - The open DSP solution with ten quality effects included



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ULTIMATE SOUND MACHINES

Signal-Processing Software

Manufacturer	Product	Version	Processor Type	Minimum System Requirements	Format and Platform	Automation	Operates in Real-time	Special Features	List Price
BIAS Inc.	SoundSoap	1.1	Broadband noise reduction	Mac OS 10.2, Win XP	Standalone and VST on Mac/standalone, VST & DirectX on Win XP	Yes	Yes	Simple to use, learn noise/noise-only functions	\$99
Camel Audio	CamelPhat	2.11	Multi-effect (compressor/distortions/filters/bass enhancer, more)	Any Mac or Win computer running a VST host	VST Mac (OS 8/ OS 9/OS X)/ Win (Win 95 or later)	Yes	Yes	High-quality, 64-bit, analog-modeling, signal-processing algorithms	\$49
CreamWare Audio Solutions Inc.	Interpole	N/A	Stereo analog filterbank	Win, Mac, CPU 400+, 256 MB RAM	Luna II, PowerSampler II, Pulsar XTC, Pulsar II, Power-Pulsar, Scope/SP, software version 3.1c, PC/Mac9.2	Yes	Yes	Wild filter modulations and warm analog feel for digital production	\$112
CreamWare Audio Solutions Inc.	Masterverb Pro	N/A	Reverb	Win 95/98/2000/XP, 400 MHz, 128 MB RAM, Mac OS 8.6 up to 9.2, G3 B/W, 400 MHz, 128 MB RAM	PC, Mac, VST, standalone, Scope Fusion Platform	Yes	Yes	Effect with zero latency, no CPU-load	\$198
CreamWare Audio Solutions Inc.	Optimaster	N/A	Multiband dynamics	SFP 3.1c	Win, Mac	Yes	Yes	The processor combines a normalizer, multiband expander, multiband compressor, and multiband limiter	\$249
CreamWare Audio Solutions Inc.	PSY Q	N/A	Psycho acoustic processor	SFP 3.1c	Win, Mac	Yes	Yes	Professional psychoacoustic equalizer behind an unassuming surface	\$198
CreamWare Audio Solutions Inc.	Vinco	1	Compressor	SCOPE Fusion Platform 3.1	Scope Fusion Platform	Yes	Yes	High-end vintage compressor	\$198
Cycling '74	pluggo	3	Variety	Mac OS, 128 MB	VST, MAS, RTAS	Yes	Yes	Over 100 plug-ins and synths	\$199
DARTech, Inc.	DART Pro 98	1.1.13	Click/hiss removal, wideband noise removal, hum removal, equalizer	Intel or AMD CPU (400MHz or higher) 64 MB RAM, 1.2 GB HD	Win 95/98/ME, Win NT, Win 2000, Win XP	No	Yes	DirectX support, CD-burning utility included	\$99
DARTech, Inc.	DART XP Pro	1.x	Noise removal, equalizer, pitch and time compression/expansion, reverb	Intel or AMD CPU (400MHz or higher) 64 MB RAM, 1.2 GB HD	Win 95/98/ME, Win NT, Win 2000, Win XP	No	Yes	Audio restoration, noise reduction, CD-burning utility included	\$199
delaydots.com	Phat Pro DX	3.2	Sub-harmonic processor	Win 9x, 128 MB RAM	DirectX	No	Yes	Two bass-enhancing modes, full controllable limiter. Recommended for DD 5.1 LFE channel processing.	\$25
delaydots.com	Spectral Plug-ins Pack	1.5	Spectral processors: morpher, shaper and extractor	Win 9x, 128 MB RAM	DirectX, VST PC	Yes	Yes	3 unique DSP plug-ins: Spectral Morpher, Shaper, and Extractor. Presets created by Martin Walker.	\$55
delaydots.com	Sound Designers Plug-ins Pack	2.4	Multiband pitch shifter, subharmonic processor, distortion device	Win 9x, 128 MB RAM	DirectX, VST PC	Yes	Yes	Phat Pro DX (advanced version of Phat), subharmonic generator as bonus for bundle buyers	\$55
delaydots.com	PitchWorks DX (freeware)	1.1	Pitch/tempo/speed processor	Win 9x, 128 MB RAM	DirectX Media	No	Yes	Allow alternate pitch (preserve time), tempo (preserve pitch), and speed (quality resampler)	Free
DSound	VL2 Multichannel Valve Interface	1.0	Surround dynamics	Mac, Win	PowerCore	Yes	Yes	Up to 8-channel operation	\$279
DUY	DUY DSPider	3.0	Modular plug-in builder	Mac OS 9, 2 MB RAM, compatible with OS X	TDM (Mix & HDI)/ Mac, compatible with OS X	Yes	Yes	DUY DSPider allows user to make plug-ins modularly	\$1,195
DUY	DUY ReDSPider	3.0	Plug-in library (reverb, dynamics processor, NR, synth effect, EQs, distortion)	Mac OS 9, 2 MB RAM, compatible with OS X	TDM (Mix & HDI)/ Mac, compatible with OS 9 and OS X	Yes	Yes	Plug-in library of over 250 plug-ins which can be loaded from any Digidesign host	\$545
DUY	DUY Analog Bundle	3.0	Analog-sound simulation (tubes/valves & tape saturation)	Mac OS 9, 2 MB RAM, compatible with OS X	TDM (Mix & HDI)/ Mac, compatible with OS 9 and OS X	Yes	Yes	DUY Analog Bundle includes DUY DaD Tape and DUY DaD Valve analog simulation plug-ins	\$875
DUY	DUY Global Bundle	3.0	Analog simulation (tapes/tubes), dynamics, stereo enhancer	Mac OS 9, 2 MB RAM, compatible with OS X	TDM (Mix & HDI)/ Mac, compatible with OS 9 and OS X	Yes	Yes	Includes DUY DaD Tape, DaD Valve, ReDSPider, Shape	\$1,545
DUY	DUY EverPack RTAS/Audiosuite	2.0	Reverb, analog tube simulation, stereo enhancer, dynamics	Mac OS 9, 2 MB RAM, compatible with OS X	RTAS & AudioSuite/ Mac OS 9 and OS X	Yes	Yes	Includes DUY DaD Valve, DUY Z-Room, DUY Shape, Max DUY and DUY Wide plug-ins	\$425
DUY	DUY EverPack for VST	1.5/1.1	Reverb, analog tube simulation, stereo enhancer, dynamics	Mac OS 9, 2 MB RAM	VST/Mac	Yes	Yes	Includes DUY DaD Valve, Z-Room, Shape, Max DUY, and Wide plug-ins for VST	\$229

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Signal-Processing Software

Manufacturer	Product	Version	Processor Type	Minimum System Requirements	Format and Platform	Automation	Operates in Real-time	Special Features	List Price
DUY	DUY EverPack for MAS	1.4	Reverb, analog tube simulation, stereo enhancer, dynamics	Mac OS 9, 2 MB RAM	MAS-MOTU/Mac	Yes	Yes	Includes DUY DaD Valve, Z-Room, Shape, Max DUY and DUY Wide plug-ins for MOTU/MAS	\$249
DUY	DUY EverPack for Premiere	1.5	Reverb, analog tube simulation, stereo enhancer, dynamics	Mac OS 9, 2 MB RAM	Premiere/Mac	No	No	Includes DUY DaD Valve, Z-Room, Shape, Max DUY and Wide plug-ins for Adobe Premiere	\$229
DUY	DUY SynthSpider	2.0	Modular synthesizer for TDM	Mac OS 9, 2 MB RAM. Compatible with OS X	TDM (Mix & HDI)/Mac, compatible with OS 9 and OS X	Yes	Yes	Modular synthesizer for TDM with high-quality sounds and creative versatility	\$895
Elemental Audio Systems	Firium	1.1	Linear phase EQ	Mac OS 9 (PowerPC G3), Mac OS X (PowerPC G4), Win 95/ME/2000/XP	VST (Mac OS 9/Mac OS X/Win), Audio Unit (Mac OS X)	No	Yes	Spectrum analyzer, draw EQ freehand, mastering quality	\$129
Elemental Audio Systems	Eqium	1.1	Paragraphic EQ	Mac OS 9 (PowerPC G3), Mac OS X (PowerPC G4), Win 95/ME/2000/XP (P III equivalent or better)	VST (Mac OS 9/Mac OS X/Win), Audio Unit (Mac OS X)	No	Yes	Unlimited bands, 11 filter types, hum-removal filters	\$129
Epinoisis Software	Digital Ear	4.2	Audio-to-MIDI converter	Pentium class, 16 MB RAM, sound card	Win 95/98/2000/XP	No	Yes	Converts audio to MIDI in real-time, tracks brightness and volume	\$79
Epinoisis Software	Digital Ear Real-Time	4.02	Audio (WAV)-to-MIDI converter	32 MB RAM, sound card, Win 95/98/XP/2000/NT	Win 95/98/XP/2000/NT	No	Yes	Real-time conversion, pitch, volume and brightness conversion	\$119
FASoft	ParEQ	1.2	Paragraphic EQ	Win 95/98/ME/NT/2000/XP	DirectX	Yes	Yes	Spectrum analyzer, guitar tuner	\$20
FASoft	Compressor	1.1	Dynamics processor	Win 95/98/ME/NT/2000/XP	DirectX	Yes	Yes		\$20
GenieSys Voice L.C.	DeClipper	2.0	Audio restoration	Intel P-II-266, Win 98 SR, 32 MB	DirectX Plug-In/Win 98/ME/NT/2000/XP	Yes	Yes	Restore overclipping distortions in audio file	\$20
GenieSys Voice L.C.	SchizoRat Pack	1.0	Spectral & harmonic FFT-analysis/synth	Intel Celeron 400, Win ME, 64 MB	DirectX Plug-In/Win 98/ME/NT/2000/XP	Yes	Yes	Pack includes 5 DirectX plug-Ins	\$48
IK Multimedia Production	AmpliTube	N/A	Guitar/amp and effects modeling	Win 98/XP, Mac OS 9 and OS X, 256 MB RAM	HDTM, RTAS, VST, MAS, DXi	Yes	Yes	Guitar amp and effects model for PC/Mac for Pro Tools	\$399
IK Multimedia Production	T-RackS standalone	N/A	Equalizer, tube-comp, multiband limiter, soft clipper	Win 98/XP, Mac OS 9 and OS X, 256 MB RAM	Standalone	No	No	Models actual hardware mastering gear circuit by circuit	\$299
IK Multimedia Production	T-RackS plug-in	N/A	Equalizer, tube-comp, multiband limiter, soft clipper	Win 98/XP, Mac OS 9 and OS X, 256 MB RAM	HDTM, RTAS, VST, DXi	Yes	Yes	Complete analog mastering suite for your host program	\$399
IK Multimedia Production	Amplitude Live	N/A	Guitar amp and effects modeling	Mac OS X	Standalone	No	Yes	Operates independently of a host program, making your computer your amp	\$129
INA-GRM	Classic Bundle	1.5	Doppler, EQ, delays, band pass, comb filters, resonance, others	Mac OS X/OS 9, Win XP	TDM, HDTM/RTAS/AS, VST	Yes	Yes	Unique interface including 2-D potentiometer, elastic string, savable snapshots, and preset morphing	\$399-\$549
INA-GRM	ST Bundle	1.5	Compression-expansion, EQ, spectral transform, transposer	Mac OS X/OS 9, Win XP	HTDM, RTAS, AudioSuite, VST	Yes	Yes	Unique interface controls, real-time EQ band automation, FFT analysis	\$399-\$549
iZotope, Inc.	Ozone	2.0	Multiband dynamics, equalization, reverb, exciter	Win 98SE/ME/2000/XP, 450 MHz Pentium II or higher, 128 MB RAM	DirectX	Yes	Yes	Complete 64-bit analog-modeled mastering system	\$199
iZotope, Inc.	Vinyl	1.5	Lo-fi vinyl record simulation	Win 98SE/ME/2000/XP, 450 MHz Pentium II or higher, 128 MB RAM	DirectX	No	Yes	64-bit lo-fi record-player emulation	Free
iZotope, Inc.	Trash	1.0	Multiband distortion, amp simulation, filters, and delays	Win 98SE/ME/2000/XP, 450 MHz Pentium II or higher, DirectX for Win, 128 MB RAM	Yes	Yes		48 distortion models, 85 amp and cabinet models, and 6 vintage delay models	\$199
iZotope, Inc.	Spectron	1.0	Spectral processing effects	Win 98SE/ME/2000/XP, 450 MHz Pentium II or higher, 128 MB RAM	DirectX	Yes	Yes	Spectral delay, morphing, panning, and modulation effects	\$99
Keyfax NewMedia	GridLok	1.0	Tempo-synced MIDI LFOs	Mac, system requirements as for Logic 5.0	Mac, Emagic Logic 5.0	Yes	Yes	260 tempo-synced MIDI LFO templates for Logic Automation	\$35

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Manufacturer	Product	Version	Processor Type	Minimum System Requirements	Format and Platform	Automation	Operates in Real-time	Special Features	List Price
Line 6	Amp Farm	N/A	Guitar amps and tube distortion	N/A	TDM	Yes	Yes	An industry standard for guitar recording on TDM, with classic amp emulations	\$595
Line 6	Echo Farm	N/A	Vintage echo and delay	N/A	TDM	Yes	Yes	Classic tape echo, old-school analog delay, and filterswept echophonic modulations	\$495
Magix Entertainment Corporation	Magix Audio Cleaning Lab 2004	N/A	Declicker, decrackler, de-hisser, de-esser, derumbler + compressor, sound cloner, brilliance/EQ	Win 98/98SE/2000/ME/NT/XP, 400 MHz, 64 MB RAM, 16-bit full-duplex sound card	Standalone/Win	Yes	Yes	DirectX support, CD Burning, 25 pro effects, 4-ch. surround, spectral analysis, time stretch, pitch shift	\$50
Metric Halo	ChannelStrip	1.2.3	EQ, gate, compressor	Mac OS	TDM, RTAS/AS, MAS, VST	Yes	Yes	3 plugs in one interface	\$299-\$699
Mixman Technologies, Inc.	Mixman VST	N/A	25 DSP algorithms	Win 98, ME, 2000, XP	VST plug-in for Cubase	No	Yes	Includes Mixman track playback and loading, plus DSP	\$79
Native Instruments	NI-Spektral Delay	1.5	Delay	Mac OS 8.6 or higher, G3 300 MHz, 128 MB RAM, Win 98 Pentium 400 MHz, 128 MB RAM	Standalone, VST 2.0, Direct Sound, DirectConnect, ASIO, SoundManager, DXi, MME	Yes	Yes	Real-time Fast Fourier Transformation, level, delay time, feedback level for each band	\$299
Prosoniq	Orange Vocoder	2.0	Vocoder	Mac G3, OS 8.1/PC Pentium II/266	VST, Mac and PC (RTAS Mac only)	Yes	Yes		\$199
Prosoniq	Magenta	1.0	Pitch resynthesizer	Mac: 350 MHz PPC	Mac and PC (RTAS Mac only)	Yes	Yes	Choir maker	\$199
Prosoniq	VST Bundle	1.0	Reverb, 3D/VoxCiter effect rack voc. processing/ effect, rack mastering	Mac: PPC601/120MHz PC: PentiumII/266	VST: Mac and PC (RTAS Mac only)	Yes	Yes		\$349
Prosoniq	TimeFactory	1.8	Time stretch/pitch shift	PC PentiumII 266MHz/Mac PPC 120MHz	Standalone Mac/PC	No	No	Batch processing	\$449
Prosoniq	sonicWorx Studio	2.6	Complete mastering and restoration	Mac PPC G3	Mac only, OS 8.6	Yes	Yes	Batch processing/voice reduction	\$449
Prosoniq	sonicWorx PowerBundle	2.6	Mastering, restoration, sound design	Mac G3	Mac only, OS 8.7	Yes	Yes	70 Soundesign algorithms, complete mastering and restoration	\$649
PSPaudioware.com s.c.	PSP VintageWarmer	N/A	Dynamics processor	Mac/PC 128 MB RAM	VST, DirectX, MAS, RTAS	Yes	Yes	Single or multiband signal processing	\$149
PSPaudioware.com s.c.	PSP VintageMeter	N/A	Metering plug-in	Mac/PC 128 MB RAM	VST, DirectX, MAS	Yes	Yes	Provides professional VU and PPM metering for mono and stereo tracks	Free
PSPaudioware.com s.c.	Lexicon PSP 42	N/A	Stereo delay and phrase sampler	Mac/PC 128 MB RAM	VST, DirectX, MAS, RTAS	Yes	Yes	Up to 9,600 ms of delay time depending on internal sampling frequency, phrase sampler capability	\$149
PSPaudioware.com s.c.	PSP StereoPack	N/A	Stereo plug-in	Mac/PC 64 MB RAM	VST, DirectX, MAS	Yes	Yes	Stereo enhancer, stereo controller, stereo analyser, pseudostereo	\$24
PSPaudioware.com s.c.	PSP MixPack	N/A	Dynamics processors	Mac/PC 128 MB RAM	VST, DirectX, MAS	Yes	Yes	Mix saturator, mix treble, mix bass, mix pressor	\$100
PSPaudioware.com s.c.	PSP PianoVerb	N/A	Reverb	Mac/PC 128 MB RAM	VST, DirectX, MAS	Yes	Yes	Reproduces reverberation originally provided by piano strings	Free
Roland	Boss GS-10	N/A	Guitar multi-effects processor	Win 98, Mac OS 8.6	Standalone	Yes	Yes	Audio to USB converter, bundled on-screen editing and Cakewalk recording software	\$595
Serato Audio Research	Equalizer	N/A	Spectrum analyzer, graphic EQ	Mac OS & Win	RTAS & HTDM for Mac OS & Win	Yes	Yes	Phase linear, automatic room tuning, edit EQ curves over a spectrum analysis	\$299
Serato Audio Research	Scratch - studio edition	N/A	Record scratching within Pro Tools	Mac OS & Win	RTAS & HTDM	No	Yes	Scratch digital samples or sound files in Pro Tools using your existing turntables or mouse	\$299
Serato Audio Research	Pitch	N/A	Pitch	Mac OS, Win	RTAS & TDM Mac OS & Win	Yes	Yes	Polyphonic, real-time, multichannel pitch shifting with MIDI control	\$399
Serato Audio Research	Pitch n Time 2	N/A	Pitch shifting and time compression/expansion	Mac OS & Win	AudioSuite - Pro Tools 4.0 and higher including HD & Pro Tools Free	No	No	Artifact-free pitch shifting and time compression/expansion	\$799
Sonic Timeworks	Equalizer V1	1.1	EQ	Win 98/ME/NT/2000/XP, Pentium II	DirectX	Yes	Yes	TrueResponse	\$249
Sonic Timeworks	ReverbX	1.01	Reverb	ProTools/ProTools LE Win/Mac	RTAS	Yes	Yes		\$149
Sonic Timeworks	ReverbX	1.03	Reverb	Win 98/ME/NT/2000/XP, Pentium II	DirectX	Yes	Yes		\$249
Sonic Timeworks	CompressorX	1.01	Dynamics	ProTools/ProTools LE Win/Mac	RTAS	Yes	Yes		\$149

Signal-Processing Software

Manufacturer	Product	Version	Processor Type	Minimum System Requirements	Format and Platform	Automation	Operates in Real-time	Special Features	List Price
Sonic Timeworks	CompressorX	1.3	Dynamics	Win 98/ME/NT/2000/XP, Pentium II	DirectX	Yes	Yes		\$179
Sonic Timeworks	ChannelX	1.01	EQ/Dynamics	ProTools/ProTools LE Win/Mac	RTAS	Yes	Yes		\$149
Sonic Timeworks	X-Bundle	1.01	Reverb/EQ/Dynamics	ProTools/ProTools LE Win/Mac	RTAS	Yes	Yes		\$349
Sonic Timeworks	Studio Bundle	3.1	Reverb/EQ/Dynamics	Win/Mac	Creamware SFP Scope/Pulsar	No	Yes		\$499
Sony Electronics Inc.	Oxford Plug-in PCR-3EQG1	N/A	EQ	Approved TC Works CPU	Win 98SE/ME/2000/XP, Mac OS 9.0.4	Yes	Yes	4 selectable EQ styles, noise below -130 dB, 2 separate HF and LF filters	\$540
Sony Electronics Inc.	Oxford Plug-in PTH-REOM1	N/A	EQ	Approved Digidesign CPU and hardware configuration	Mac	Yes	Yes	5 separate sections with HF and LF selectable to shelf, 4 EQ styles	\$850
Sony Electronics Inc.	Oxford Plug-in IPTH-GEQM1	N/A	EQ	Approved Digidesign CPU	Mac	Yes	Yes	GML 8200 emulation	\$1,200
Sony Electronics Inc.	PT-INFLG1	N/A	Inflator	Approved Digidesign CPU and hardware, Mac OS 9.0.4 or higher including OS X 10.2	Mac OS 9.0.4 or higher including OS X 10.2, 256 MB RAM	Yes	Yes	Increases the loudness of almost any program material, creates warmth, character, and dynamics	\$450
Sony Electronics Inc.	PC-INFLG1	N/A	Inflator	Approved TC Works CPU and hardware, Mac OS 9.0.4 or higher	Win 98SE/ME/2000/XP	Yes	Yes	Increases the loudness of almost any program material, creates warmth, character and dynamics	\$340
Sony Electronics Inc.	PTR-3DYG1	N/A	Dynamics	For Digidesign: Mac OS 9.0.4 or higher including OS X 10.2. For TC Works: Mac OS or Win 98SE	Digidesign: Mac OS. TC Works: Mac OS or Win 98SE/ME/2000/XP	Yes	Yes	Channel dynamics with separately controlled sections for compressor, limiter, gate, and expander	\$850
Sound Toys by Wave Mechanics	FlangeThing	1.0	Analog tape flange simulation	Pro Tools 5.0-6.1	RTAS, TDM, and AudioSuite for Mac OS 9, OS X, Win XP	Yes	Yes	Rhythmic modulated tape flanging	\$TBA
Sound Toys by Wave Mechanics	PhaseMistress	1.0	Phasing	Pro Tools 5.0-6.1	RTAS, TDM, AudioSuite for Mac OS 9 and OS X, Win XP	Yes	Yes	Analog-modeling phase shifter, tempo-locked modulation	\$TBA
Sound Toys by Wave Mechanics	FilterFreak	1.0	48db/octave resonant filtering	Pro Tools 5.0-6.1	RTAS, TDM, and AudioSuite for Mac OS 9 and OS X, Win XP	Yes	Yes	Super Steep Filter and tempo modulation	\$249
Sound Toys by Wave Mechanics	EchoBoy	1.0	Analog style tape echo/delay	Pro Tools 5.1-6.1	RTAS, TDM, AudioSuite for Mac OS 9, OS X, and Win XP	Yes	Yes	Emulation of classic tape echo machines, with rhythmic control	\$TBA
Sound Toys by Wave Mechanics	Tremolator	1.0	Rhythmic amplitude modulation	Pro Tools 5.1-6.1	RTAS, TDM, AudioSuite for Mac OS 9, OS X, and Win XP	Yes	Yes	The Tremolator offers full manipulation of groove	\$TBA
Sound Toys by Wave Mechanics	PanMan	1.0	Automatic panner	Pro Tools 5.1-6.1	RTAS, TDM and AudioSuite for Mac OS 9, OS X, and Win XP	Yes	Yes	Create clean, smooth sweeps, or hard-dotted 32nd note stutter panning	\$TBA
Sound Toys by Wave Mechanics	Crystallizer	1.0	Granular echo synthesizer	Pro Tools 5.1-6.1	RTAS, TDM and AudioSuite for Mac OS 9, OS X, and Win XP	Yes	Yes	This versatile granular echo processor creates synthlike textures	\$TBA
Sound Toys by Wave Mechanics	Decapitator	1.0	Bit- and sample-rate reduction	Pro Tools 5.1-6.1	RTAS, TDM and AudioSuite for Mac OS 9, OS X, and Win XP	Yes	Yes	Intensify a drum track, add dust or gravel to a track, or create harsh distortion or noise	\$TBA
Sounds Logical	WaveWarp	2.0.4	Multi-effects	Win 98/Me/NT4/2000/XP	Standalone, DirectX	No	Yes	Modular, hundreds of components, unlimited combinations	\$199
Symbolic Sound Corporation	Kyma X	X	Define your own algorithms in software	Mac OS 9, Win ME	Mac OS X, Win XP	Yes	Yes	Live spectral analysis/resynthesis, live granulation, morphing, cross-synthesis	\$3,570
Synchro Arts Ltd.	VocAlign Project	2.7	Audio-alignment software	Win, Mac	Standalone/Win, Mac	No	No	Automatically edits one audio signal to align with another	\$299
Synchro Arts Ltd.	VocAlign Project for Pro Tools	2.9	Automatic audio alignment	Win, Mac	AudioSuite plug-in	No	No	Edits one audio signal to align with another automatically	\$299
TC Works	Assimilator	1.0	EQ assimilation and morphing	Win, Mac, OS X: VST/AU - OS 9.x: VST/MAS, sequencer, PowerCore v1.6.1 or higher	DSP, PowerCore	Yes	Yes	Learns EQ curves to apply to own material	\$249
TC Works	Native Bundle	3.0	Dyn. processor, limiter, reverb, graphic/parametric EQ, filter, sidechainer	Mac OS X or Classic, Win, 128 MB RAM, VST/AU sequencer	VST/AU, Mac or Win	Yes	Yes	Pro EQs, Filter plug-In with Envelope Follower	\$499

Signal-Processing Software

Manufacturer	Product	Version	Processor Type	Minimum System Requirements	Format and Platform	Automation	Operates In Real-time	Special Features	List Price
TC Works	Master X3 f or PowerCore	2.2	Mastering processor	Win, Mac, VST/MAS sequencer, PowerCore	DSP, PowerCore	Yes	Yes	Multiband dynamics and dithering	\$249
TC Works	FX Machine	2.5	Multi-effect and synth generator	Mac OS Classic or Win, 128 MB RAM, VST/MAS sequencer	VST/MAS, Mac or Win	No	Yes	21 plug-ins included, doubles as VST Instrument, Sonic Destructor upon Registration	\$199
TC Works	TC Tools	3.5	Reverb, EQ, chorus/delay	Pro Tools 24 Mix or HD, Mac/PC meeting DigiDesign requirements	TDM - HD	Yes	Yes	New support HD and 96k	\$795
TC Works	Master X3	3.0	Mastering processor	Pro Tools 24 Mix or HD, Mac/PC meeting DigiDesign requirements	TDM - HD	Yes	Yes	Multiband dynamics and dithering	\$495
The Sound Guy, Inc.	SFX Machine RT	1.02	Multi-effects, modulation effects	VST2.0 or Audio Unit host, 300 MHz	VST, Audio Unit, Mac OS 8.5/9 & OS X 10.2, Win 9x-XP	Yes	Yes	Pitch tracker and envelope follower, Randomizer, MIDI Learn, hundreds of presets	\$99
Trillium Lane Labs	TL MasterMeter	1.0	Oversampling meter	Mac OS X	Pro Tools TDM	No	Yes	Oversampling meter for critical mastering applications	\$199
Ultrafunk	fx.compressor	R3	Dynamics processor	Win 95/98/Me/NT4/2000/XP	DirectX and VST	Yes	Yes		\$50
Ultrafunk	fx.delay	R3	Delay	Win 95/98/Me/NT4/2000/XP	DirectX and VST	Yes	Yes		\$50
Ultrafunk	fx.equalizer	R3	Equalizer	Win 95/98/Me/NT4/2000/XP	DirectX and VST	Yes	Yes		\$50
Ultrafunk	fx.gate	R3	Dynamics processor	Win 95/98/Me/NT4/2000/XP	DirectX and VST	Yes	Yes		\$50
Ultrafunk	fx.modulator	R3	Modulator	Win 95/98/Me/NT4/2000/XP	DirectX and VST	Yes	Yes		\$50
Ultrafunk	fx.multiband	R3	Dynamics processor	Win 95/98/Me/NT4/2000/XP	DirectX and VST	Yes	Yes		\$100
Ultrafunk	fx.phase	R3	Phase processor	Win 95/98/Me/NT4/2000/XP	DirectX and VST	Yes	Yes		\$25
Ultrafunk	fx.reverb	R3	Reverb	Win 95/98/Me/NT4/2000/XP	DirectX and VST	Yes	Yes		\$50
Ultrafunk	fx.surround	R3	Surround/stereo	Win 95/98/Me/NT4/2000/XP	DirectX and VST	Yes	Yes		\$50
Ultrafunk	fx.wahwah	R3	Equalizer	Win 95/98/Me/NT4/2000/XP	DirectX and VST	Yes	Yes		\$25
Ultrafunk	Sonitus: fx plug-in pack	R3	Multi-effects	Win 95/98/Me/NT4/2000/XP	DirectX and VST	Yes	Yes	Includes all ten Sonitus:fx plug-ins	\$299
Waldorf-Music	D-Coder	1.0	Vocoder with an integrated synthesizer for tone generation	Mac OS X: VST/AU sequencer, OS 9.x: VST/MAS sequencer, Win XP, PowerCore v1.6.1 or higher	DSP, PowerCore	Yes	Yes	Responds to polyphonic or monophonic MIDI and Free Run	\$249
Waldorf-Music	AFB16	1.0	Analog filter bank with USB2.0 for computer connection	Win XP SP1, 500 MHz or faster, 256 MB RAM, compatible host software	Standalone box with USB 2.0	Yes	Yes	Total integration of 16 real analog filters into a computer based digital studio environment	\$2,495
Wave Arts	MasterVerb	3.08	Reverb	N/A	VST (Mac OS 9/OS X/Win), DX (Win), MAS (OS 9/OS X), AU, RTAS (OS 9/OS X)	Yes	Yes	CPU efficient	\$150
Wave Arts	TrackPlug	3.08	10-band EQ, compressor, gate	N/A	VST (Mac OS 9/OS X/Win), DX (Win), MAS (OS 9/OS X), AU, RTAS (OS 9/OS X)	Yes	Yes	All-in-one channel strip, CPU efficient	\$130
Wave Arts	WaveSurround	3.08	Spatial enhancer, wide reverb	N/A	VST (Mac OS 9/OS X/Win), DX (Win), MAS (OS 9/OS X), AU, RTAS (OS 9/OS X)	Yes	Yes		\$90
Wave Arts	Power Couple	3.08	MasterVerb/TrackPlug bundle	N/A	VST (Mac OS 9/OS X/Win), DX (Win), MAS (OS 9/OS X), AU, RTAS (OS 9/OS X)	Yes	Yes		\$200
Wave Mechanics	PurePitch	2.8	Pitch change, harmonizer, vocal effects	Pro Tools TDM 5.0-6.1	TDM, Mac OS 9 and OS X, Win 2000, NT, XP	Yes	Yes	High-quality formant-preserving vocal pitch processor	\$495
Wave Mechanics	PitchDoctor	2.8	Pitch correction	Pro Tools TDM 5.0-6.1	TDM, Mac OS 9 and OS X, Win 2000, NT, XP	Yes	Yes	Possibly the only formant-preserving automatic tuning plug-in	\$495
Wave Mechanics	SoundBlender	1.4	Multi-effects	Pro Tools TDM 5.0-6.1	TDM, Mac OS 9 and OS X, Win 2000, NT, XP	Yes	Yes	Diatonic harmonizing, delay, chorus, filter and modulation effects	\$495
Wave Mechanics	Speed	1.4	Time compression, expansion, and pitch shifting	Pro Tools 5.0-6.1	AudioSuite, Mac OS 9, and OS X; Win 2000, NT, XP	Yes	Yes	Polyphonic pitch and time correction	\$495
Wave Mechanics	UltraTools	2.3	Pitch, time, and effects	Pro Tools TDM 5.0-6.1	TDM, Mac OS 9 and OS X; Win 2000, NT, XP	Yes	Yes	Complete effects bundle including Pure Pitch, Pitch Doctor, Sound Blender, and Speed	\$1,195

Signal-Processing Software

Manufacturer	Product	Version	Processor Type	Minimum System Requirements	Format and Platform	Automation	Operates in Real-time	Special Features	List Price
WaveMachine Labs	Drumagog	3.9	Drum replacer	Win 95, 98, ME, 2000, XP	DirectX	No	Yes	Automatically replaces drum tracks with new samples. Includes library, or use WAV files	\$149
Waves, Ltd.	Native Power Pack	4.x	EQ, comp/gate/expander, limiter, delay, reverb, de-esser, stereo imager	Mac OS 9.2.2 or 10.2 and above, G4, Win 98, NT, 2000, XP, 512 MB RAM	RTAS, AudioSuite, VST, Audio Units, MAS, and DirectX	Yes	Yes	All-in-one bundle. Includes 8 plug-ins.	\$500
Waves, Ltd.	Masters Native Bundle	4.x	L2 Ultramaximizer, linear phase EQ/multi band compressor	Mac OS 9.2.2 or 10.2 and above, G4, Win 98, NT, 2000, XP, 512 MB RAM	RTAS, AudioSuite, VST, Audio Units, MAS, and DirectX	Yes	Yes	Linear phase EQ and Multiband introduce no phase distortions. Includes the award-winning L2.	\$900
Waves, Ltd.	Gold Native Bundle	4.x	EQ, multi band comp, reverb, dynamics, delay, flange, chorus	Mac OS 9.2.2 or 10.2 and above, G4, Win 98, NT, 2000, XP, 512 MB RAM	RTAS, AudioSuite, VST, Audio Units, MAS, and DirectX	Yes	Yes	Includes daily tools, sweetening, mastering processors, and sound-design mindbenders	\$1,300
Waves, Ltd.	Platinum Native Bundle	4.x	EQ, reverb, dynamics, psycho-acoustics, delay, flange, chorus	Mac OS 9.2.2 or 10.2 and above, G4, Win 98, NT, 2000, XP, 512 MB RAM	RTAS, AudioSuite, MAS, VST, Audio Units, and DirectX	Yes	Yes	Includes Waves Gold Bundle, Masters Bundle, Renaissance Channel, and Renaissance Collection 2	\$2,100
Waves, Ltd.	Masters TDM Bundle	4.x	L2 Ultramaximizer, linear phase EQ/multiband compression	Mac OS 9.2.2 or 10.2 and above, G4, Win 98, NT, 2000, XP, 512 MB RAM	TDM, RTAS, AudioSuite, VST, Audio Units, MAS, and DirectX	Yes	Yes	Linear phase EQ and Multiband introduce no phase distortions. Also includes the L2 Limiter.	\$1,800
Waves, Ltd.	Gold TDM Bundle	4.x	EQ, reverb, dynamics, delay, flange, chorus, comp/gate/expansion	Mac OS 9.2.2 or OS 10.2 and above G4, Win 98SE, ME, 2000, XP, 512 MB RAM	HD, TDM, RTAS, AudioSuite, VST, AU, MAX, DirectX	Yes	Yes	Includes daily tools, sweetening, mastering processors, and sound-design mindbenders.	\$2,600
Waves, Ltd.	Platinum TDM Bundle	4.x	EQ, multiband comp, flange, linear phase, dynamics, psychoacoustics	Mac OS 9.2.2 or 10.2, G4, Win 98, NT, 2000, XP, 512 MB RAM	TDM, VST, Audio Units, RTAS, AudioSuite, MAS, and DirectX	Yes	Yes	Includes Waves Gold, Masters, and Renaissance Maxx Collection	\$4,200
Waves, Ltd.	Renaissance Maxx Native Collection	4.x	Compressor, EQ, reverb, bass enhancement, channel strip, d-essing	Mac OS 9.2.2 or OS 10.2 and above, G4, Win 98, NT, 2000, XP, 512 MB RAM	RTAS, AudioSuite, VST, Audio Units, MAS, and DirectX	Yes	Yes		\$600
Waves, Ltd.	Renaissance Maxx TDM Collection	4.x	Compressor, EQ, reverb, bass enhancement, channel strip, d-essing	Mac OS 9.2.2 or OS 10.2 and above, G4, Win 98, NT, 2000, XP, 512 MB RAM	HD, TDM, RTAS, AudioSuite, VST, Audio Units, MAS, and DirectX	Yes	Yes		\$1,200
Waves, Ltd.	Restoration Native Bundle	4.x	Noise reduction, hum removal, click removal, crackle removal	Mac OS 9.2.2 or OS 10.2 and above, G4, Win 98, NT, 2000, XP, 512 MB RAM	RTAS, AudioSuite, VST, Audio Units, MAS, and DirectX	Yes	Yes	Software-based restoration and noise reduction. Includes 4 plug-ins.	\$1,200
Waves, Ltd.	Restoration TDM Bundle	4.x	Noise reduction, hum removal, click removal, crackle removal	Mac OS 9.2.2 or OS 10.2 and above, G4, Win 98, NT, 2000, XP, 512 MB RAM	TDM, RTAS, AudioSuite, VST, Audio Units, MAS, and DirectX	Yes	Yes	Software-based restoration and noise reduction. Includes 4 plug-ins.	\$2,400
Waves, Ltd.	Transform Native	4.x	Time and pitch shifting, vocoding, doubling, transient shaping	Mac OS 9.2.2 or OS 10.2 and above, G4, Win 98, NT, 2000, XP, 512 MB RAM	RTAS, AudioSuite, VST, Audio Units, MAS, and DirectX	Yes	Yes	Control with shape time, pitch, instrument sound, rhythmic contour, and dimension	\$1,200
Waves, Ltd.	Transform TDM Bundle	4.x	Time and pitch shifting, vocoding, doubling, transient shaping	Mac OS 9.2.2 or OS 10.2 and above, G4, Win 98, NT, 2000, XP, 512 MB RAM	TDM, RTAS, AudioSuite, VST, Audio Units, MAS, and DirectX	Yes	Yes	Control with shape time, pitch, instrument sound, rhythmic contour, and dimension	\$2,400
Waves, Ltd.	360 Surround TDM Tools	4.x	Limiting, panning, reverb, compressing, dithering, filters	Mac OS 9.2.2 or OS 10.2 and above, G4, Win 98, NT, 2000, XP, 512 MB RAM	TDM	Yes	Yes	A complete surround toolkit	\$2,400
Waves, Ltd.	Broadcast & Production Native Bundle	4.x	EQ, multiband comp, reverb, hum/crackle/click/noise removal, linear phase	Mac OS 9.2.2 or OS 10.2 and above, G4, Win 98, NT, 2000, XP, 512 MB RAM	VST, Audio Units, RTAS, AudioSuite, MAS, and DirectX	Yes	Yes	Includes the Renaissance Maxx Bundle, the Masters Bundle, and the Restoration Bundle	\$2,400
Waves, Ltd.	Broadcast & Production TDM Bundle	4.x	EQ, comp, reverb, hum/crackle/click/noise removal, phase, dynamics	Mac OS 9.2.2 or OS 10.2 and above, G4, Win 98, NT, 2000, XP, 512 MB RAM	TDM, VST, Audio Units, RTAS, AudioSuite, MAS, and DirectX	Yes	Yes	Includes the Renaissance Maxx Bundle, the Masters Bundle, and the Restoration Bundle	\$4,800
Yamaha Corporation of America	Pitch Fix	1.0	Pitch correction	Win XP, Mac OS 9-X	VST/AU Mac OS 9-X, Win XP	Yes	Yes	Formant-based pitch correction and shifting, pitch control via a MIDI keyboard	\$299
Yamaha Corporation of America	Vocal Rack	1.0	Dynamics, EQ, enhancer, and gate	Win XP, Mac OS 9-X	VST/AU Mac OS 9-X, Win XP	Yes	Yes	Includes highpass filter, compressor, harmonic enhancer, 3-band EQ, de-esser, gate, and delay	\$199
Yamaha Corporation of America	Final Master	1.0	Dynamics	Win XP, Mac OS 9-X	VST/AU Mac OS 9-X, Win XP	Yes	Yes	Multiband compressor, limiter with adjustable frequency control, 3 soft-clipping models, look ahead	\$199
zplane development	z.matrix	1.01	Surround Panning Module	Win, Mac	Creamware Pulsar/Scope	Yes	Yes	Support for up to 16 loudspeaker, doppler effect, source grouping	\$498

Software Instruments

Manufacturer	Product	Version	Type	Minimum System Requirements	Automation	Number of Envelope Generators	Format	Multitimbral (number of parts per instance)	Modulation Sources (Number/Type)
Access Music GmbH	Indigo TDM	N/A	Synth	Win, Mac	Yes	2	TDM	20	30
Antares Audio Technologies	kantos	1.0	Audio-controlled synth	Win 9x or higher, Mac OS 8.6	Yes	2	DirectX, VST (Mac OS X/PC), MAS, RTAS (Mac OS X/PC)	1	7
Applied Acoustics Systems	Tassman	3.0	Modular sound-synthesis studio	Win 98SE, 2000, XP, PIII 500 MHz; Mac OS 9.x, OS X 2, G4 recommended	Yes	Unlimited	Standalone, DXi, VSTi, RTAS, Audio Unit	1	Unlimited: LFO, ADAR, VADAR, ADSR, VADSR, envelope follower, keyboard
Applied Acoustics Systems	Lounge Lizard EP	2	Synth/emulation of electric pianos	Win 98/SE/2000/XP; Mac OS X 2/PIII 450 MHz, G3 400 MHz	Yes	N/A	Standalone, VSTi, DXi, RTAS, Audio Unit	N/A	3: keyboard, velocity, LFO
Arturia	Moog Modular V	1.1	Modular synthesizer	Win 9x/2000/ME/XP; Mac OS 9.x/X.2, 128 MB RAM, 500 MHz CPU	Yes	8	Standalone, DXi, VSTi, HTDM, MAS, RTAS	N/A	2 LFOs + 1 sequencer (3x8 steps)
Arturia	Storm Music Studio	2.0	Virtual studio including synths, drum machines, and effects	Win 9x/2000/ME/XP; Mac OS 9.x/ Mac OS X - 128 MB RAM	Yes	N/A	Standalone, VSTi, ReWire	N/A	N/A
BitHeadz, Inc.	Unity AS-1	3.2	Analog synth	Mac OS 8.6-9.x, 10.1 G3 500 MHz, 128 MB RAM	Yes	N/A	Standalone, Audio Unit, VST, MAS, RTAS, ReWire, Direct Connect	CPU dependent	CPU dependent
BitHeadz, Inc.	Unity DS-1	3.2	Digital sampler	Mac OS 8.6-9.x, 10.1 G3 500 MHz, 128 MB RAM	Yes	N/A	Standalone, Core Audio, Audio Unit, VST, MAS, RTAS, ReWire, Direct Connect	CPU dependent	CPU dependent
BitHeadz, Inc.	Unity Session	3.2	Synth and sampling environment	Mac OS 8.6-9.x, 10.1 G3 500 MHz, 128 MB RAM	Yes	N/A	Standalone, Core Audio, Audio Unit, VST, MAS, RTAS, ReWire, Direct Connect	CPU dependent	CPU dependent
BitHeadz, Inc.	Unity Synth Expander	3.2	Synth/sampler	Mac OS 8.6-9.x, 10.1 G3 400 MHz, 128 MB RAM	No	Unlimited	Standalone, Audio Unit, RTAS, VST, MAS (OS 9)	CPU dependent	CPU dependent
Camel Audio	Cameleon 5000	1.01	Synth	Win 95 or later/Mac OS X	Yes	128	VSTi, AU	1	2 flexible LFOs
Chicken Systems, Inc.	Translator	3.0	Sample-conversion software	Win 95, Mac OS 8.6, 32 MB RAM	Yes	N/A		N/A	N/A
CreamWare Audio Solutions Inc.	Minimax	N/A	Synth	SCOPE Fusion Platform 3.1	Yes	2	SCOPE Fusion Platform	1	N/A
CreamWare Audio Solutions Inc.	Modular	3	Synth, sound design	SCOPE Fusion Platform 3.1	Yes	Unlimited	Scope Fusion Platform	1	N/A
Cycling '74	Max/MSP	4/2	Sound design	Mac OS, 128 MB RAM	No	Unlimited	Standalone	Unlimited	Unlimited
Edirol	HQ HyperCanvas	1.5	Synth	Win 98/ME/SE/2000/XP, 128 MB RAM, Mac OS 8.6, 9.x, 192 MB RAM	Yes	N/A	VST, DXi	16	2 per patch/modulation, tremolo
Edirol	HQ SuperQuartet	N/A	Synth	Win 98/ME/SE/2000/XP, 128 MB RAM, Mac OS 8.6, 9.x, 192 MB RAM	Yes	N/A	VST, DXi	16	2 per patch/modulation, tremolo
Edirol	HQ Orchestral	N/A	Synth	Win 98/ME/SE/2000/XP, 128 MB RAM, Mac OS 8.6, 9.x, 192 MB RAM	Yes	N/A	VST, DXi	16	3 per patch/modulation, random modulation, vibrato
Edirol	Virtual Sound Canvas	3.23	Synth	Win 98/ME/SE/2000/XP, 64 MB RAM, Mac OS 8.6, 9.x, 128 MB RAM	Yes	N/A	Standalone, VST, DXi	16	2 per patch/modulation, tremolo
eowave	iSynth	1.2	Sound design	Mac G3 OS 8.6	Yes	4	RTAS, VST, MAS	5	10
FXpansion Audio UK Ltd.	DR-008	1.11	Drum machine	Pentium II/233	Yes	Varies	DXi, DXi2, VSTi	96	Varies
FXpansion Audio UK Ltd.	BFD	1.0	Acoustic drum module	Win 2000, XP, Mac OS X, 512 MB RAM, VSTi, DXi, RTAS, Audio Unit	Yes	N/A	VSTi, DXi, RTAS, Audio Unit, stand-alone	1	N/A
FXpansion Audio UK Ltd.	VST-AU Adapter	1.1	Adapter	Mac OS X	Yes	N/A	Audio Unit	16	N/A
FXpansion Audio UK Ltd.	Mind FX Vol. 1	1.0	Sound design	Win 9x/2000/XP, Mac OS X, Pentium 3 500, Athlon 500, G4 400	Yes	N/A	VSTi, DXi, RTAS, Audio Unit	N/A	Up to 4
FXpansion Audio UK Ltd.	MindFX vol. 2	1.0	Sound design	Win 9x/2000/XP, Mac OS X, Pentium III/500, Athlon 500, G4 400	Yes	N/A	VSTi, DXi, RTAS, Audio Unit	N/A	Up to 4
IK Multimedia Production	SampleTank XL	1.1.9	Virtual sound module	Mac/PC, OS 9 and OS X, 256 MB RAM	Yes	N/A	HTDM, RTAS, MAS, VST, DXi	16	8
IK Multimedia Production	SampleTank 2	N/A	Virtual sound workstation	Mac/PC, Win 98 thru XP, OS 9 and X	No	N/A	RTAS, VST, MAS, DXi, AU	16	Up to 50
IK Multimedia Production	SampleTank L	N/A	Virtual sound module	Mac/PC, OS 9 and OS X, 256 MB RAM	No	N/A	HTDM, RTAS, MAS, VST, DXi	16	8

Filters (Number/Type)	Oscillators (Number/Type)	Real-time Editing	Number of Programs/ Performances	Synthesis Methods	Special Features	List Price
2	4	Yes	N/A	Virtual analog	Build in effects, vocoder, patch compatible with Access hardware synthesizers	\$798
3 filters, 2P highpass, 4P highpass, 2 & 4 pole bandpass	4: two wavetable, 2 LFO	Yes	20+/N/A	Wavetable, user-added waveforms	Driven by audio input, extracts pitch, dynamics and harmonic content from input audio	\$299
Lowpass 12 & 24 db, bandpass, highpass, comb, phaser, flanger	Unlimited: VCO strings, plates, membranes, bars, flute, FM sinus	Yes	Unlimited/unlimited	Physical modeling, analog modeling, additive, FM, subtractive, sample playback	Fully modular, unique modules reproducing acoustic objects via physical modeling	\$499
4 wah wah, phaser, tremolo, delay	Mallet, tone, time, noise, key release 5	Yes	50+	Physical modeling	Emulation of classic electric pianos: Rhodes, Wuritzer, RMI	\$249
3 filters - 10 modes (lowpass, highpass)	9 oscillators (square, saw, sin, triang) + 1 noise (pink/white)	Yes	400+ presets	Subtractive synthesis	Polyphonic up to 64 voices, fixed filter bank, delay, chorus	\$329
N/A	N/A	Yes	N/A	Sample playback, wavetables, analog model, physical model	Composition wizard, Hall (Internet chat and file exchange tool), 10 effects, built-in sequencer	\$149
2 filters/13 filter types	3 stereo	Yes	1,700/N/A	Analog model	Tables, built-in effects	\$199
2 filters/13 filter types	2 stereo	Yes	N/A	Sample playback	Support for multiple sample file formats, tables, built-in effects	\$399
2 filters/13 filter types	Sampler has 2 stereo, synth has 3 stereo	Yes	2,500+/N/A	Sample playback, analog model, FM, physical modeling	Stream from disk, support for multiple sample file types, built-in effects, tables, split/layered programs	\$499
2/13 types	8	Yes	550	FM, wave sequencer, vector synth, brass model, glottal model, electric piano	Modular/plugin-in architecture	\$199
2	64	Yes	300	Additive (also subtractive)	Unique resynthesis ability to analyze sampled sounds, realtime morphing between four sounds	\$299
N/A	N/A	Yes	N/A	N/A	44x44 matrix of sampler formats, transferrable between each other	\$150
1 per voice, 24 db/octave	3	Yes	400+/N/A	Analog model	Complete emulation of the minimoog	\$249
N/A	N/A	No	N/A	N/A	More than 200 modules and 100 patches	\$249
Unlimited	Unlimited	Yes	N/A	Any		\$495
1 per patch/cutoff, resonance	N/A	Yes	256/128	Sample playback	Software synth for General MIDI 2 sounds	\$205
1 per patch/cutoff, resonance	N/A	Yes	70/384	Sample playback	Software synth for acoustic and electric rhythm section, instruments, piano, bass, guitar, and drums	\$250
1 per patch/cutoff, resonance	N/A	Yes	145/216	Sample playback	Software synth for orchestral instruments, style templates	\$385
1 per patch/cutoff, resonance	N/A	Yes	902/N/A	Sample playback	GM2/GS compatible, MIDI to WAV/AIFF file conversion, 100 royalty-free MIDI files included	\$50
LP, BP, HP	20	Yes	100/100	Sample, analog model	Integrated sequencer	\$79
2 per voice HP/LP	20	Yes	200+/N/A	Sample playback, analog model, FM, percussion model	Modular drum machine, 600+ MB of sounds, ready-to-use groove library, multiple outs	\$149
N/A	N/A	Yes	8 Kits	Sample playback	Quality drum kits	\$299
N/A	N/A	Yes	N/A	Utility/wrapper	Converts Mac OS X VST plug-ins to Audio Unit	\$75
Up to 20	up to 4	Yes	64	N/A	Advanced real-time interactive MIDI control	\$249
Up to 20	up to 4	Yes	64	N/A	Advanced real-time interactive MIDI control	\$249
N/A	N/A	Yes	450+	N/A		\$499
2	2	Yes	1,500+	Resampling, pitch shift, Stretch	Stretch, sounds	\$499
N/A	N/A	Yes	200	N/A		\$279

Software Instruments

Manufacturer	Product	Version	Type	Minimum System Requirements	Automation	Number of Envelope Generators	Format	Multitimbral (number of parts) per instance	Modulation Sources (Number/Type)
IK Multimedia Production	Studio Bundle	N/A	Bundle includes AmpliTube, SampleTank and T-RackS	MAS/PC, OS 9 and OS X, 512 MB RAM	No	N/A	N/A	N/A	N/A
jambient Software	jambient	0.9	Sampler-synth	Win 98, XP	Yes	N/A	Standalone	16	N/A
Mill Productions	Modularing	3.0	Synth, sampler, drum machine, sequencers	Mac OS X	Yes	2 or 3 per unit	Standalone including MIDIShare and CoreAudio	Unlimited	1 per parameter
Mixman Technologies, Inc.	Mixman StudioXPro	N/A	Real-time sample playback, step sequencer and DSP	Win 98, ME, 2000, XP, 64 MB RAM	No	N/A	Standalone	256	N/A
Muon Software, Ltd.	Electron	1	Synth	Win 9x-XP, 64 MB RAM, Mac OS 9, Mac OS X 64 MB RAM	Yes	2	VSTi and DXi	1	2 ADSR, 2 LFO
Muon Software, Ltd.	Tau Pro	1	Bass/lead monosynth	Win 9x-XP, 64 MB RAM, Mac OS 9, Mac OS X 128 MB RAM	Yes	1	VSTi	1	2
Muon Software, Ltd.	Tau Bassline Mk2	1	TB303 emulation (synth)	Mac OS 9, OS X, Win 9x/ME/XP/2000, 300 MHz processor, 128 MB RAM	Yes	1	VSTi	1	1
Native Instruments	Pro-53	3.0	Synth	Win 98/2000/ME/XP, Pentium 266 MHz, 64 MB RAM, Mac OS 8.6 or higher, G3 266 MHz, 64 MB RAM	Yes	2	Standalone, VST 2.0, MAS, DXi	N/A	6 LFO, oscillator modulation, 2 envelopes, velocity, keyposition, LFO rate from delay FX
Native Instruments	Reaktor	3.0	Modular synth	Win 98/2000/ME/XP, Pentium 300 MHz, 128 MB RAM, Mac OS 8.6 or higher, G3 300 MHz, 128 MB RAM	Yes	Unlimited	Standalone, VST 2.0, MAS, DXi	16	Unlimited
Native Instruments	Reaktor Session	1.0	Modular synth	Win 98/2000/ME/XP, Pentium 300 MHz, 128 MB RAM, Mac OS 8.6 or higher, G3 300 MHz, 128 MB RAM	Yes	Unlimited	Standalone, VST 2.0, MAS, DXi	16	Unlimited
Native Instruments	Battery	1.01	Drum sampler	Win 98/2000/ME/XP, Pentium 266 MHz, 64 MB RAM, Mac OS 8.6 or higher, G3 266 MHz, 64 MB RAM	Yes	2	Standalone, VST 2.0, MAS, DXi	N/A	8cc's/5 ext/constant loop count/random unipolar/bipolar
Native Instruments	Kontakt	1.1	Sampler	Win 98/2000/ME/XP, Pentium 300 MHz, 128 MB RAM, Mac OS 8.6 or higher, G3 300 MHz, 128 MB RAM	Yes	3	Standalone, VST 2.0, MAS, DXi, OMS	N/A	7 ext/6 LFO (sin, tri, sq, saw, rand, mult), 3 env (dbd, ahdsr, 32 step), 3 special (sequencer, env follower, glide)
Native Instruments	Absynth	1.3.3	Semi modular synth	Win 98/2000/XP, Pentium 400 MHz, 128 MB RAM, Mac G3 400 MHz, 128 MB RAM (plug-in use)	Yes	19	Standalone, VST 2.0, MAS, DXi	N/A	12 envelopes, 3 LFO 9 MIDI ccs
Native Instruments	B4	1.1	Tonewheel organ	Win 98/2000/ME/XP or NT 4.0, Pentium 233 MHz, Mac OS 8.6 or higher, PPC 604, 233 MHz, 64 MB RAM	Yes	N/A	VST 2.0, MAS, DXi	N/A	N/A
Native Instruments	FM7	1.1	Synth	Win 98/2000/ME/XP, Pentium III 450 MHz, 128 MB RAM, 16-bit sound card, Mac OS 8.6 or higher, G4 400 MHz, 128 MB RAM	Yes	16	Standalone, VST 2.0, MAS, DXi	N/A	2 LFO, 128 MIDI ccs (external)
Nyr Sound Ltd.	Chaosynth	2	Synth	Win 9x, VST Host, DXi Host, or Sketch (by Nyr Sound)	Yes	8	VST, DXi, stand-alone (via Sketch)	Unlimited	Granules, 8 LFO, 8 SAH, 8 envelopes + controllers, routings from outputs and Note On
Nyr Sound Ltd.	Ice	1	Subtractive synth	Win 9x	Yes	8	DXi, VST, stand-alone (via Nyr Sound Sketch)	Unlimited	Several envelopes, LFOs, Global LFOs, routings from oscillators, filters, ring mods, and waveshapers
Propellerhead Software	Reason	2.5	Music production instrument	Win 98/ME/2000/XP, PII 233, 64 MB RAM, Mac OS 9/X, Power PC 604/166, 128 MB RAM	Yes	N/A	Stand alone, ReWired	N/A	N/A
Propellerhead Software	ReBirth	2.0.1	Techno micro composer	Win 95, Pentium, 16 MB RAM, Mac OS 7.5.3, PowerPC 66 MHz, 16 MB RAM	Yes	2	Standalone, ReWired	N/A	N/A
Roland	VariOS	2.5	Synth, sampler	Win ME/2000/XP, Mac OS 9/X	Yes	N/A	Standalone and with Computer	N/A	Depends on application
SeerMusic Systems	SuperConductor Pro	3.4	Sampler, interpreter	Win, Mac, 64 MB RAM	Yes	Unlimited	Standalone	128	N/A
SeerMusic Systems	Reality	1.56	Softsynth, sampler, sound design	Win 9x, ME, 64MB RAM	Yes	4+	Standalone or integrate with any sequencer	16	Unlimited

Filters (Number/Type)	Oscillators (Number/Type)	Real-time Editing	Number of Programs/ Performances	Synthesis Methods	Special Features	List Price
N/A	N/A	No	N/A	N/A	Combines all 3 IK titles into 1 recording package	\$799
N/A	N/A	Yes	N/A	Sample playback	Joystick control, drag-and-drop sample loading, 3-D spatializing, scripting	\$50
1 per synth	2 per synth	Yes	16/unlimited	Subtractive, wavetable, sample source	Stereo mix engine for HD recording for iTunes/QuickTime	\$TBA
N/A	N/A	No	N/A	Real-time sample playback up to 32 proprietary tracks, each up to 128 samples per track	W.A.R.P (real-time FX), scratching, overdub recording, step sequencer, DSP module, editing	\$110
2 LP/HP/BP/BR with flexible routing	3	Yes	32/N/A	Subtractive	X-Y controller, flexible filter routing	\$80
LP18, LP24, LP36	2	Yes	32/N/A	Subtractive, real-time wave modulation	Built-in stereo effects, real-time wave modulation, sync, ringmod	\$35
1	1	Yes	32	Highly accurate TB303 model	Accurately emulates the Roland TB303	\$20
2 24 dB low-pass filter with resonance and self-oscillation, additional highpass filter mode	2 oscillators with 3 waveforms plus noise	Yes	576/N/A	Subtractive	Fashioned after the vintage cult synths of the '80s, includes effects unit	\$199
Unlimited	Unlimited	Yes	Thousands/N/A	Subtractive, FM, wavetable, sampling, granular, additive, Resynthesis and more	Native modular real-time software for synthesis, sampling and effects processing, instruments and presets	\$499
Unlimited	Unlimited	Yes	Thousands/N/A	Subtractive, FM, wavetable, sampling, granular, additive, Resynthesis and more	Reaktor Audio engine for synthesis, sampling, and effects, library of instruments	\$349
N/A	N/A	Yes	Unlimited/unlimited	Sampling	For drum sounds, 54 inst., each w/128 velocity layers, tuning, vol., pitch, bit reduction, shaper, FX Loop	\$199
11: 1 Pole LP, 2 Pole LP, 4 Pole LP, 1 Pole HP, 2 Pole HP, 4 Pole HP, 1+1 Pole BP, 2+2 Pole BP, 6 pole LP/2+2 Pole Notch/ 3 x 2 Pole Multi/6-36 DB	N/A	Yes	Unlimited/unlimited	Granular, resynthesis, sampling	Dynamic resource allocation, real-time granular time-stretching, comprehensive modulation capabilities	\$399
8 LP -6dB, LP-12dB, LP-24dB, HP -6dB, HP -12dB, BP, notch, comb	6: Wavetable, Draw, Wav extract, sine, etc.	Yes	700/N/A	Additive, subtractive, FM, AM, ring modulation, and waveshaping	68 brkpoints per env, semimodular struct., drawable waveforms, authentic tonewheel organ simulation	\$299
N/A	91 oscillators/virtual tonewheels	Yes	120/N/A	Additive	Authentic simulation of the original tonewheel organ, scanner vibrato/chorus, rotary speaker	\$235
3, HP, BP, LP filter types can be crossfaded with one another	6 oscillators with 32 different waveforms	Yes	290/N/A	FM synthesis, subtractive, wavetable	Extended sound architecture, analog-style editing, graphical editors	\$299
8 filters selectable from LP24, LP12, HP and BP, 8 distorting waveshapers various types	Up to 64 controlled by cellular automata	Yes	Unlimited/N/A	Granular driven by Cellular Automata	Cellular Automata	\$90
Several filters 24db LP, 12 LP/HP/BP, Ring mods, waveshaper distorters	Up to 8, sine, sawtooth, square, triangle, parabola, multisaw, various options	Yes	Many	Subtractive	Lots of modulations, high number of components available	\$90
N/A	N/A	Yes	N/A	Samples, subtractive analog model, graintable synthesis, REX playback	Configurable rack of instruments and effects, expands with user's needs	\$449
3	2	Yes	N/A	Analog modeling	Accurate software emulation of the classic techno boxes. TB-303, TR-808 and TR-909	\$159
Depends on application	Depends on application	Yes	N/A	VariPhrase, sample playback, analog model	Open System Module, V-Producer software	\$1,495
N/A	N/A	Yes	1000+/128	Hierarchical pulse, predictive note shaping, organic vibrato, expressive intonation tuning	Create realistic performances	\$299
4 multimode filters	4 oscillators, 4 LFO	Yes	1000+/128	Sample playback, virtual analog, advanced FM, physical models, model synthesis, combined synthesis		\$99

Software Instruments

Manufacturer	Product	Version	Type	Minimum System Requirements	Automation	Number of Envelope Generators	Format	Multitimbral (number of parts) per instance	Modulation Sources (Number/Type)
SeerMusic Systems	SurReal	1.01	Synth, sampler	Win 9x, ME, 64 MB RAM	No	4	Standalone, integrates into any sequencer	16	Unlimited
Software Technology	VAZ 2010	1.13	Synth	Win 9x, ME, NT, 2000, XP, Pentium, 32 MB RAM	Yes	2	Standalone, VSTi, DXi	16	19, 2 can be set to MIDI controller, 2 are controlled by the built-in sequencer
Software Technology	VAZ Modular 2	2.54	Modular analog synth	Win 9x, ME, NT, 2000, XP, Pentium II, 32 MB RAM	Yes	255	Standalone, VSTi, DXi	16	Unlimited
Software Technology	VAZ Plus 2	2.02	Synth	Win 9x, ME, NT, 2000, XP, Pentium II, 32 MB RAM	Yes	2	Standalone, VSTi, DXi	N/A	19, 2 can be set to MIDI controller, 2 are controlled by the built-in sequencer
Sonicreef	Tsunami	1.5	Virtual analog synth	Win 95 or higher, Mac OS 8.0 or higher	Yes	2	VSTi, DXi, AU (in dev)	N/A	3. LFO, envelope, ring modulation
Sound Quest Inc.	Infinity	2.0	Synth, sampler, drum machine, sound-design	Win 95/98/ME/NT/2000/XP, 64 MB RAM	Yes	Unlimited	Standalone, VSTi, DXi	N/A	Unlimited
Spectrasonics	Stylus - Vinyl Groove Module	1.0	Groove box	Win 98 or higher, 500 MHz PIII or better, Mac OS 8 or higher, 350 MHz G3 or better	Yes	N/A	VST OS 9/OS X/Win, RTAS OS 9/OS X, MAS OS 9/OS X, Audio Unit	N/A	15 including LFOs, envelopes, randomizer, CC11, key position, wheels
Spectrasonics	Trilogy - Total Bass Module	1.0	Sample-based all-bass module	Win 98 or higher, 500 MHz PIII or better, Mac OS 8 or higher, 350 MHz G3 or better	Yes	N/A	VST OS 9/OS X/Win, RTAS OS 9/OS X, MAS OS 9/OS X, Audio Unit	N/A	19 including LFOs, envelopes, randomizer, CC11, key position, wheels
Spectrasonics	Atmosphere - Dream Synth Module	1.0	Sample-based layering synth	Win 98 or higher, 500 MHz PIII or better	Yes	N/A	VST OS 9/OS X/Win, RTAS OS 9/OS X, MAS OS 9/OS X, Audio Unit	N/A	19 including LFOs, envelopes, randomizer, CC11, key position, wheels
Speedsoft	VSampler	3.0	Sampler, synth, sound design	Win 98, ME, NT, 2000, XP, 128 MB RAM Mac OS 8 or higher, 350 MHz G3 or better	Yes	15	Standalone, DXi, VSTi, ReWire	16	30+ internal, 128 external
Steinberg	Groove Agent	N/A	Drum machine	Mac OS 9 or OS X version 10.2, Win 2000, XP	Yes	N/A	VSTi	N/A	N/A
Steinberg	D'cota	N/A	Multiple synthesis VST instrument	Win 2000, XP, Mac OS 9, OS X version 10.2		4	VSTi	N/A	N/A
Steinberg	HALion	2.0	Synth	Win 2000, XP, Mac OS X 10.2, 192 RAM	Yes	2	VST, DXi	16	32-stage envelope as mod source
Steinberg	Hypersonic	1.0	Synth	Win 2000/XP, Mac OS X, 256 RAM	Yes	N/A	VST	16	N/A
Symbolic Sound Corporation	Kyma X	X	Sound design	Win ME, Mac OS 9	Yes	Unlimited	Standalone	16	Any module can modulate any parameter
Synapse Audio	Hydra	4.1	Synth	Win 98/ME/2000/XP, Mac OS, 16 MB RAM	Yes	4	DXi, VSTi	1	LFO on amplitude, filter or both, Special Modulation Oscillator
Synapse Audio	Scorpion	4.0	Synth	Win 98/ME/2000/XP, Mac OS X, 8 MB RAM	Yes	3	DXi, VSTi	1	LFO on filter/pitch, Ω modwheel, pitchbend, LFO
Synapse Audio	Plucked String	4.0	Synth	Win 98/ME/2000/XP, Mac OS, 8 MB RAM	Yes	1	DXi, VSTi	1	1 vibrato effect
Ultimate Sound Bank	Plugsound Vol. 1 Keyboards Collection	1.8	Sample-based synth	Win 98, ME, 2000, NT, XP, Mac OS 8.6 128 MB RAM	Yes	N/A	VST OS 9/OS X/Win, RTAS OS 9/OS X, MAS OS 9/OS X, Audio Unit	N/A	LFOs, envelopes, wheels
Ultimate Sound Bank	Plugsound Vol. 2 Fretted Instruments	1.8	Sample-based synth	Win 98, ME, 2000, NT, XP, Mac OS 8.6 128 MB RAM	Yes	N/A	VST OS 9/OS X/Win, RTAS OS 9/OS X, MAS OS 9/OS X, Audio Unit	N/A	LFOs, envelopes, wheels
Ultimate Sound Bank	Plugsound Vol. 3 Drums & Percs Elements	1.8	Sample-based synth	Win 98, ME, 2000, NT, XP, Mac OS 8.6 128 MB RAM	Yes	N/A	VST OS 9/OS X/Win, RTAS OS 9/OS X, MAS OS 9/OS X, Audio Unit	N/A	LFOs, envelopes, wheels
Ultimate Sound Bank	Plugsound Vol. 4 Hip Hop & R'n'B Toolkit	1.8	Sample playback synth	Win 98, ME, 2000, NT, XP, Mac OS 8.6 128 MB RAM	Yes	N/A	VST OS 9/OS X/Win, RTAS OS 9/OS X, MAS OS 9/OS X, Audio Unit	N/A	LFOs, envelopes, wheels
Ultimate Sound Bank	Plugsound Vol. 5 World of Synthesizers	1.8	Sample-based synth	Win 98, ME, 2000, NT, XP, Mac OS 8.6 128 MB RAM	Yes	N/A	VST OS 9/OS X/Win, RTAS OS 9/OS X, MAS OS 9/OS X, Audio Unit	N/A	LFOs, envelopes, wheels
Ultimate Sound Bank	Plugsound Vol. 6 Global Collection	1.8	Sample playback synth	Win 98, ME, 2000, NT, XP, Mac OS 8.6 128 MB RAM	Yes	N/A	VST OS 9/OS X/Win, RTAS OS 9/OS X, MAS OS 9/OS X, Audio Unit	N/A	LFOs, envelopes, wheels

Filters (Number/type)	Oscillators (Number/type)	Real-time Editing	Number of Programs/ Performances	Synthesis Methods	Special Features	List Price
4 multimode filters	4 oscillators, 4 LFO	No	1000+/64	Sample playback, virtual analog, advanced FM, physical models, model synthesis, combined synthesis	Plays back Banksets created in Reality and SF2s. Authors SeerMusic Works.	\$49
14, with 2/4 pole multimode variations, including resonance and separation modulation	2 plus 2 LFO (1 of which can be used as a 3rd oscillator)	Yes	Unlimited/ unlimited	Analog, sample playback, subtractive	Analog polyphonic sequencer per part. Hosts VST/DX and VSTi plug-ins. 16 channel mixer with effects.	\$179
255 12 including type A, B with low, band- and highpass Type C lowpass 2/4 pole	1 up to 255 per part, with a choice of several, including granular and wavetable	Yes	128/unlimited granular, wavetable	Sample, analog model, modules for creating new sounds	Authentic analog sound	\$299
9, with 2/4 pole multimode variations, including resonance and separation modulation	2 plus 2 LFO (1 of which can be used as a 3rd oscillator)	Yes	Unlimited/ unlimited	Analog, sample playback, subtractive	Analog polyphonic sequencer	\$69
1 24 dB lowpass filter	4: 3 waveform and 1 noise	Yes	64/N/A	Subtractive, analog model	Waveform drawing and morphing	\$69
Unlimited - Reson, low-highpass, low-high-shelf, parametric EQ, bandpass, band reject, FIR, IIR	Unlimited - saw, square, pw, sine, pulse, triangle, pulse, impulse, parabola, custom	Yes	Unlimited/ unlimited	Subtractive, additive, sample playback, FM, Karplus-strong	User-creatable custom instruments, includes 14 synths, 7 organs, 2 drum machines, over 40 effects	\$399
Master filter, plus 3 lowpass and 1 highpass filters	1 (sample-based)	Yes	3,000/3,000	Sample playback, subtractive	Groove control, 38,000 samples, groove randomization, groove editing, zone menus	\$299
Master filter, plus 3 lowpass and 1 highpass filters	2 (sample-based)	Yes	500/500	Sample playback, subtractive	True staccato sample mapping, mono-legato glide modes, acoustic/electric/synth bass	\$349
Master filter, plus 3 lowpass and 1 highpass filters	2 (sample-based)	Yes	2,000/1,000	Sample playback, subtractive	Interactive layering control, programmable sample start points	\$399
10 filter types 6 dB - 24 dB, LP, HP, BP	255 stereo voices	Yes	16,384	Sample playback, subtractive synth engine	Imports all major sampler formats, disk streaming, instruments preview, powerful mod matrix	\$189 Euro
N/A	N/A	Yes	50	N/A	Set the amount of drum room ambience, play fills and half-time breaks	\$250
N/A	N/A	Yes	N/A	N/A		\$250
Notch; HP; LP; BP 12/24 db; Waldorf	2 LFO syncable	Yes	128	sample	Integrated waveloop editor; sample accurate timing, content included	\$399
N/A	N/A	Yes	1000+	Multisample; Virtual Analog; FM; Wavetable; Sliced Loop; Drumkit; expandable	Multitimbral, multisynthesis workstation w/effect/mixing capabilities; 1,000+ hyper patches; macro editing	\$499
High-, low-, band-, allpass, frequency domain	Table-lookup, oscillator banks, samples used as oscillators	Yes	Unlimited	All standard synthesis algorithms plus additive, aggregate, granular, others	Software for sound design with hardware accelerator, professional-quality surround audio	\$3,570
LP, BP, HP, LP + notch, 24 dB each with separation control	2 in single mode, 4 in dual-voice mode, 40 waveforms per osc	Yes	150/N/A	Analog modeling, phase modulation, subtractive synthesis	Multimodel synth, dual voice mode, bass boost, percussive mode	\$99
LP 18 dB, LP 30 dB, LP + notch, inv LP 30 dB	2	Yes	100	Analog model	Spectral FX, chorus/delay/tremolo FX	\$69
1	1	Yes	20	Physical modeling	5 different plucked string models	\$49
3 lowpass filters, 1 highpass filter, 1 master filter	Sample-based oscillator	Yes	N/A	Subtractive sample playback	Acoustic and electric pianos, classic keyboards, release triggers, reverb	\$99
3 lowpass filters, 1 highpass filter, 1 master filter	Sample-based oscillator	Yes	N/A	Subtractive sample playback	Acoustic and electric guitars, basses, plus world guitars	\$99
3 lowpass filters, 1 highpass filter, 1 master filter	Sample-based oscillator	Yes	N/A	Subtractive sample playback	Acoustic drum kits, all styles, electronica kits, drum machines	\$99
3 lowpass filters, 1 highpass filter, 1 master filter	Sample-based oscillator	Yes	600	Subtractive sample playback	Loops, kits, mono-mode leads, basses, dual-resonant filters	\$99
3 lowpass filters, 1 highpass filter, 1 master filter	Sample-based oscillator	Yes	512	Subtractive sample playback	Retro and modern synth sounds, dual resonant filters, reverb	\$99
3 lowpass filters, 1 highpass filter, 1 master filter	Sample-based oscillator	Yes	N/A	Subtractive sample playback	Wide variety of sounds, advanced GM set, built-in reverb	\$99

Software Instruments

Manufacturer	Product	Version	Type	Minimum System Requirements	Automation	Number of Envelope Generators	Format	Multitimbral (number of parts per instance)	Modulation Sources (Number/Type)
Ultimate Sound Bank	Plugsound Box Set	N/A	Sample-based synth	Win 98, ME, 2000, NT, XP, Mac OS 8.6.128 MB RAM	Yes	N/A	VST OS 9/OS X/Win, RTAS OS 9/OS X, MAS OS 9/OS X, Audio Unit	N/A	LFOs, envelopes, wheels
VirSyn Software	VirSyn TERA	2.0	Synth	Win 98, XP, Mac OS 9, OS X 256 MB RAM	Yes	8	Standalone, VSTi, Audio Unit, ReWire, RTAS	16	19. keytrack, pitch, velocity, aftertouch, modwheel, pitchbend, LFO
VirSyn Software	Cube	2.0	Spectral morphing additive synthesizer	Win XP, Mac OS 9, OS X, 256 MB RAM, PIII/G4	Yes	4	standalone, VST, Audio Unit, ReWire, RTAS	8	Modulation done by morphing
Waldorf-Music	Attack Percussion Synthesizer	1.2	Drum and percussion synthesizer	Win 95 to XP, 266 MHz, 64 MB RAM, Mac PPC 604e or faster, 64 MB RAM, Mac OS 8.0 to OS X 10.2	Yes	2	VSTi	24	N/A
Waldorf-Music	PPG Wave 2.V	1.2	Wavetable synthesizer	Win 95 to XP, 266 MHz, 64 MB RAM, Mac PPC 604e or faster, 64 MB RAM, Mac OS 8.0 to OS X 10.3	Yes	3	VSTi	8	N/A
Wavelength Devices	uberPLASTIC	1	Synth	CreamWare SFP/XTC v3.1	Yes	2	CreamWare SFP/XTC	Up to 16	Extensive
Wavelength Devices	sparC	1	Synth	CreamWare SFP/XTC v3.1	Yes	2	CreamWare SFP/XTC	Up to 16	Extensive
Wavelength Devices	europa	1.11	Synth	CreamWare SFP/XTC v3.1	Yes	2	CreamWare SFP/XTC	Up to 16	Extensive
Wavelength Devices	Dual Filter	1	Filterbank	CreamWare SFP/XTC v3.1	Yes	1	CreamWare SFP/XTC	NA	Key-follow, velocity, bipolar aftertouch, ADSR, LFO
WaveMachine Labs	Drumagog	3.0	Drum Replacer plug-in	Win 98/2000/ME/XP	No	N/A	Direct-X	256	N/A
yellow tools	MVI Culture	1.0	Virtual Instrument of world, ethno, industrial & orchestral percussion	Mac OS 9.2.2, OS X, Win 98, 2000, ME, XP, 256 MB RAM, 10 GB free hard disc, DVD drive	Yes	5	Mac: RTAS classic & OS X, VST 2.0 classic & OS X, AU, CoreAudio standalone, Win: RTAS, DXi, VST, standalone	8	N/A
yellow tools	MVI Candy	1.0	Virtual Instrument of soprano, alto, tenor, baritone, and bass saxophones	Mac OS 9.2.2, OS X, Win 98, 2000, ME, XP, 256 MB RAM, 10 GB free hard disc, DVD drive	Yes	5	Mac: RTAS classic & OS X, VST 2.0 classic & OS X, AU, CoreAudio standalone, Win: RTAS, DXi, VST, standalone	8	N/A
yellow tools	MVI Majestic	1.0	Virtual Instrument of electric basses from 1955-2000	Mac OS 9.2.2, OS X, Win 98, 2000, ME, XP, 256 MB RAM, 10 GB free hard disc, DVD drive	Yes	5	Mac: RTAS classic & OS X, VST 2.0 classic & OS X, AU, CoreAudio standalone, Win: RTAS, DXi, VST, standalone	8	N/A
yowstar	Cosmetic	1.0	Drum Sequencer	G3/266 OS 8.5 or OS X, 64 MB RAM	Yes	N/A	Standalone	Varies	N/A
Zarg Music	Ambient	3.0	Synth	Win, Mac	No	3	CreamWare	1	N/A
Zarg Music	Dark Star	3.0	Synth	Win, Mac	Yes	3	CreamWare	1	2 LFO, envelope follower
Zarg Music	Orion Custom	2.4	Synth	Win, Mac	Yes	2	CreamWare	1	5 LFO and envelope
Zarg Music	Prophet Plus	3.1.2	Synth	Win, Mac 9.0	Yes	2	CreamWare	1	LFO, Osc 2, noise
Zarg Music	Red Dwarf EX	3.0	Synth	Win, Mac 9.x	Yes	8	CreamWare	1	2 LFO, all envelopes, mod wheel, AT, external in
Zarg Music	Rotor 48	3.2	Synth	Win, Mac 9.x	Yes	2	CreamWare	1	1 LFO, ring mod, 4 "rotors"
Zarg Music	Rotor 48RD	1.1	Synth	Win, Mac 9.x	Yes	2	CreamWare	1	LFO, envelope
Zarg Music	Solaris	1.3	Synth	Win, Mac	Yes	4	Creamware	1	5 LFOs, sequencer

Filters (Number/Type)	Oscillators (Number/Type)	Real-time Editing	Number of Programs/ Performances	Synthesis Methods	Special Features	List Price
3 lowpass filters, 1 highpass filter, 1 master filter	Sample-based oscillator	Yes	N/A	Subtractive sample playback	All six plugsound volumes in one box	\$399
3/24/18/12 dB LP/HP/BP/BS, formant filter	9.64 waveforms, spectrum oscillator	Yes	16,384/Unlimited	Analog model, FM, spectrum syn- thesis, additive, physical modeling, formant synthesis, wave shaping	8D Sound access, song/step sequencer, built-in mixer/effects	\$279
Morphing filter with arbitrary characteristic	512 sine oscillators/voice	Yes	Unlimited	Additive synthesis	2 dimensional morphing/multistage envelopes/resynthesis	\$249
1 multimode filter with 6 types	2 oscillators with 9 waveforms each + FM + RingMod + Crack Modulator	Yes	16 kits with 24 sets	Virtual modeled circuitry synthesis	8 audio outputs (2 stereo, 4 mono), polyphonically playable percussive bass and lead sounds	\$150
PPG type lowpass filter	2 wavetable oscillators	Yes	128 sounds per bank	Wavetable synthesis	VST plug-in based on the well-known PPG Wave 2 series from the mid-'80s	\$200
3 - 12dB/3 - 24dB filters (low/high/band)	2 x sine/tri, phase-mod saw, phase/width - mod pulse, sub (square) + noise and external inputs	Yes	100+	Subtractive/FM	Unique sound, capable of lush feedback timbres	\$129
6 dB highpass/24 dB resonant lowpass	6 x switchable sine/tri/up saw/down saw/variable pulse + noise	Yes	100+	Subtractive/FM	Amazing oscillator sync and crossmod capabilities	\$129
6 dB highpass/switchable 12dB, 24dB resonant lowpass	2 x phase-mod saw/phase + width- mod pulse/sub (square) + noise	Yes	100+	Subtractive/FM	Amazing vintage analog timbres, R&B/electro great for classic funk	\$99
2 x 24 dB mixable low/high/band (all resonant)	N/A	Yes	50+	Analogue-modeled filterbank	Stereo filterbank that allows the frequencies of the left and right to be shifted apart	\$29
N/A	N/A	Yes	N/A	Drum Replacer	Visual triggering, MIDI output, GIG file import, advanced sample management	\$99- \$269
N/A	N/A	Yes	800	Sample playback	9GB brand-new percussion sounds (2 DVDS), special instrument mapping, multis with up to 8 layers	\$399
N/A	N/A	Yes	800	Sample playback	9GB brand-new saxophone sounds (2 DVDS), aftertouch volume, 4 sampled variations of each note	\$399
N/A	N/A	Yes	800	Sample playback	9GB highend e-basses sounds (2 DVDS), alternate attack, true legato mode	\$399
1 multimode	3 samplers, 1 synth, 1 VSTi	Yes		Sample playback, FM, VSTi	Probability-based sequencing for machine-based changes	\$79
2 multimode 12 dB filters, series or parallel	8: standard waveforms, wavetables, samples	Yes	100/N/A	Analog model, sample playback, subtractive	Panning for each filter, user can assign each oscillator to a pan position between the filters	\$179
4: 12/24 dB lowpass, 12 dB multimode, comb, free filter bank of 8 bandpass filters, RD modules	4: multimode, 'Juno' style, sample playback, noise, external input, RD modules	Yes	50/N/A	Analog model, sample playback, subtractive	EQ, overdrive, stereo chorus, and delay included, filters series are fully reconfigurable	\$179
4: lowpass 24 dB, highpass 12 dB, 1 2.24 dB bandpass, and comb	3: 2 multimode and 1 'Juno' style	Yes	101/N/A	Subtractive analog model, AM cross-modulation	Effects include EQ, stereo flanger, and stereo delay	\$179
1 24 dB CEM 3320 emulation lowpass	2 CEM emulation, 2 WAV (sample playback)	Yes	170/N/A	Subtractive, analog model, sample playback	Expanded Prophet, effects include distortion, chorus/flanger, delay, extensive aftertouch controls	\$263
2 filter slots - user decides, possible LP, HP, BP, comb	2 slots - multimode, spectral, wavetable, sample playback, user selectable	Yes	70/N/A	Subtractive, analog model, sample playback, semimodular	User reconfigurable - WAV oscs, 4 for env slots, 9 mod matrix paths	\$229
1 12 dB multimode (LP, HP, BP)	48: selectable from multimode, sample playback, or external ins	Yes	32/N/A	Subtractive, 4-stage crossfading "rotors" give unusual new timbres at audio rates	Each rotor plays 4 oscs sequentially, variable crossfade provides "atmospheric" pad sounds	\$99
1 - user selectable semi-modular design	48: selectable from multimode, sample playback, or external ins	Yes	30/N/A	Semimodular version of the Rotor 48, subtractive, 4-stage crossfade modulation	Same as Rotor 48, user-configurable 'semimodular' (like Red Dwarf), effects included	\$99
4 filter sections: LP, HP, BP and comb	Multimode, CEM, WaveTable, FM, Sample playback, Rotor, Modular, RD Module insert slots (user defined)	Yes	225	Subtractive, analog model, sample playback, FM	Extensive modulation matrix, flexible use of Pulsar Modular modules for sound sources and filters	\$249

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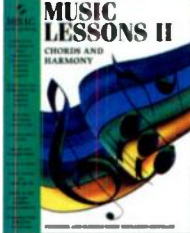
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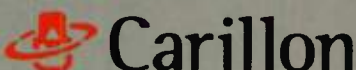


Carillon is run by computer music evangelists and fanatics. We take the same approach to every aspect of our product from ultra low noise hardware design to the painstaking configuration, test and support of every system.



AC-1 shown with optional R2H-1 Netstar™ Network ControlCard to MyNetwork (D170) and the AC-1 MIDI controller (990). Software specific photo keyboard (not shown) standard with all solutions. Feature looking screen (not shown) OS/2 is a time saving device.

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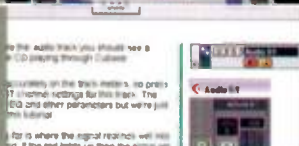
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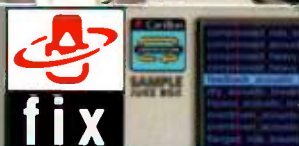
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MOTU

MUSIC PRODUCTION ESSENTIALS



828mkII
96kHz FireWire



828mkII	2 XLR/TRS combo	10 TRS in/out	8 channels (4 at 96kHz)	stereo SPDIF stereo TOSLink	44.1, 48 88.2, 96	sample- accurate	in/out	in/out	20 inputs 8 busses	front-panel LCD CueMix Software
	mic inputs	analog I/O	ADAT optical	digital I/O	sample rates	ADAT sync	word clock	MIDI I/O	CueMix DSP Mixer	mixer programming
896HD	8 XLR/TRS combo	8 XLR/TRS in 10 XLR out	8 channels (4 at 96kHz)	stereo AES/EBU with sample rate conversion	44.1, 48 88.2, 96 176.4, 192	sample- accurate	in/out	via FastLane 2x2 (sold separately)	18 inputs 8 busses	CueMix software



896HD
192 kHz FireWire

