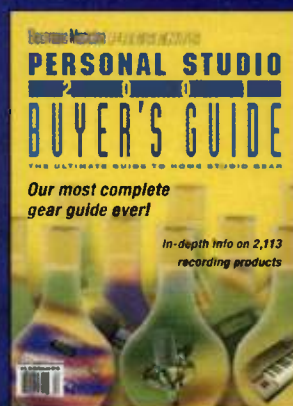


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**FIG. 2:** The Mixer window contains nine channel strips. The original voice is assigned to channel 0, and any new voices appear on the remaining strips.

while zoomed in. Unfortunately, the thumbwheel's range is limited to the zoomed-in area; you can't scroll through the entire file while zoomed in to a smaller time base.

The Zoom tool could be more sophisticated, however. For example, the zoom-out function would be more useful if it worked in stages, instead of zipping the user back to the original, prezoom display. Fortunately, a readout at the bottom of the *Harmony* window helps with pitch and time-position navigation.

The Hand tool, or Scroll cursor, allows X-Y scrolling through the display itself. Yet it suffers from the same operational limitations as the thumbwheel.

## TUNING AND LAYERING

Need to correct some pitches in a file? First, from the Scales popup menu, select a scale to which you want to tune the file. *Harmony* has presets of standard scales including major, minor, and chromatic scales, as well as 15 "exotic" scales such as BeBop, Diminished, Gypsy, and Hindu. Although details on the exotic scales are not provided, they are interesting and evocative. Scales of arbitrary pitches and frequencies are simple to construct and can be saved for later recall.

To tune a segment, simply highlight it and select the scale, and it's done. Well, almost. In reality, program material often has special requirements that demand custom settings, as I'll discuss shortly.

To add a new line to an existing part, you need to activate a new voice with the Voice Selection buttons. If voice 1 is already in use, click on voice 2 to bring up a new display of the file's original pitch; the previous pitch graph appears

in a washed-out green. Then you can edit the new voice with any of the available tools.

Before you can hear new voices, you need to unmute them in the Mixer window (see Fig. 2) because processing occurs only when the mixer channel corresponding to a given voice is unmuted. The original sound file defaults to slider 0, and new voices are assigned to sliders 1 through 8. When you first open the Mixer window, sliders 0 and 1 are unmuted, which lets you quickly compare the original file with your first new voice. You will need to unmute the channels of any additional voices.

## A LITTLE DAB'LL DO YA

The manual's Quick Start guide doesn't tell the whole story of this intriguing software. As I stated before, certain types of program material require special settings for *Harmony* to work optimally.

The Voices window (see Fig. 3) lets you change the pitch and formant settings of each voice individually. Two of the controls, Global Formant Shift and Global Pitch Shift, duplicate the Formant and Pitch controls in the Mixer display, but with greater precision (the adjustment range is  $\pm 1$  octave in 1-cent increments). Although these controls are labeled "Global" in the Voices window, the documentation refers to them as "Voice Formant Shift" and "Voice Pitch Shift," which more accurately describe their operation.

The Humanize control imposes what Arboretum calls a "realistic warble" on the processed sound. (The warble is based on a model of human vocalization.) At medium settings (on a scale of 0 to 100 percent), the effect is indeed very realistic. I tested this function by stripping the vibrato from a recording of a professional singer and adding new vibrato with the Humanize function. The new vibrato was natural sounding, but it didn't fit the musical context as well as the original. Nevertheless, this feature opens up some serious creative possibilities; its effect on a cool-jazz, muted-trumpet solo was spectacular.

The last item in the Voices display is a checkbox that lets you disable formant shifts on transposition. This option often comes in quite handy; for example, small pitch adjustments sound better without formant shifting.

The Process window (see Fig. 4) features additional global-processing parameters. The Minimum and Maximum Frequency controls determine the frequency range in which the software looks for fundamentals. In practice, *Harmony*'s maximum analysis bandwidth of 55 to 3,998 Hz usually must be reduced, which often makes the difference between a workable pitch analysis and one with undesirable artifacts, such as spikes and dropouts.

The Pitch Variation control adjusts the "capture strength" of the pitch detector. If set to a high number, the pitch detector captures large variations in pitch and represents them in the pitch graph; if set to a low number, the software is less able to track wide-ranging variations in pitch. This parameter smooths out the pitch analysis and is



**FIG. 3:** Voices can be fine-tuned in the Voices window. The Humanize feature adds some realistic "warble" based on human-vocalization models.

consequently one of *Harmony*'s most important controls. The Pitch Sensitivity control helps the software decide if a frequency is a true fundamental, overtone, or subharmonic.

The Correction Strength parameter pertains to pitch correction: high values eliminate pitch variations more completely; low values leave certain subtle pitch inflections unaffected, resulting in a more natural-sounding performance. The Global Formant Shift and Global Pitch Shift controls vary the formant and pitch of all voices equally, within a range of one octave up or down in 1-cent increments.

### GETTING THE PREVIEW

*Harmony* can drag your computer's performance down very quickly as you add more voices and processing. But the plug-in's preview mode, which you select using a checkbox in the Process window, alleviates this problem.

I tested *Harmony* on two Macs: a 400 MHz blue-and-white Yosemite G3 with 128 MB of RAM and a 300 MHz beige G3 with 128 MB of RAM, both running Mac OS 8.6. On the Yosemite, I layered eight voices and monitored them in preview mode; the beige G3 maxed out at six voices. When writing a file to disk, it's easy to forget to uncheck the preview-mode box, which results in sound-quality loss. A prompt from the program would be helpful here. Another checkbox in the Process window, Process to Mono, causes *Harmony* to write its output as a mono file (the program creates a stereo file by default).

### SUMMING IT UP

Arboretum's *Harmony* is a fantastic tool that offers all kinds of creative option

ARBORETUM  
Harmony 1.0 (Mac)  
pitch corrector/harmony processor  
\$349

FEATURES ■■■■■  
EASE OF USE ■■■  
QUALITY OF SOUNDS ■■■■■  
VALUE ■■■  
1 2 3 4 5

**PROS:** Simple, easy-to-use graphical user interface. Wide range of effects. Terrific sound quality.

**CONS:** Program crashes under certain conditions. Small, nonsizable window. No MIDI control of functions.

for processing vocals or any pitched, monophonic material. Its easy-to-use interface makes sophisticated pitch shifting and harmonization simple and controllable. Its sonic possibilities are stunning, and its sound quality is excellent. I tested *Harmony* with a 1212 I/O and an Audio-media III card, as well as with Apple's Sound Manager, with excellent results.

The documentation is in HTML format and mostly straightforward and well written. The Quick Start section gets you up and running with very little pain.

One major drawback is that *Harmony* often crashes, especially when recalculating a pitch graph after changes to the processing parameters and when closing one project and opening a new one. The crashes occurred on both test machines, and deactivating system extensions or assigning more

memory to the program didn't solve this troubling problem. Arboretum said it will address this in a revision.

However, *Harmony* is a terrific processing tool most synthesists, sound designers, composers, and arrangers won't want to miss.

Thomas Wells has been involved with audio and computer music for more than 25 years. He teaches at Ohio State University.

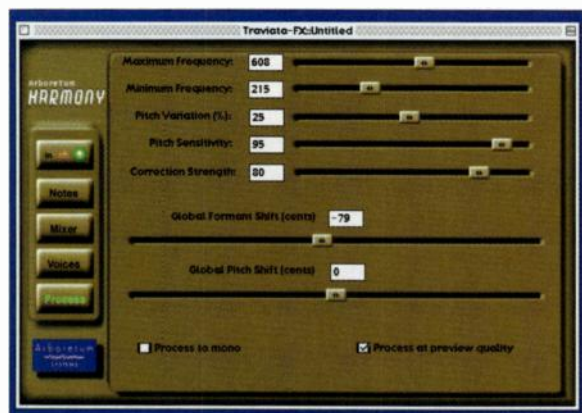


FIG. 4: A number of global parameters are set in the Process window. You can type in values or adjust them with the sliders.

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VIPER ROOM, LOS ANGELES



# QUICK PICKS

## VIRTUAL REALITY SOUND

3D Pipes

By Jeff Obee

The origins of the pipe organ can be traced back to Alexandria, Egypt, circa 300 B.C., where a chap named Ktesibius devised a method for delivering compressed air to pan pipes. The modern pipe organ

from every manual on the McLane pipe organ at Baylor University, plus the subsequent reverb from each note. During this process, a custom-designed head mic and two B&K 4006s mics were run through a custom mic preamp and Apogee converters and recorded to DAT.

The producers then separated the sustained organ sounds from the reverbs and looped them. They then faded in the reverb and crossfaded it with the manual's key release. Unlike the many Kurzweil CD-ROMs that give you a basic sample and keymap and a number of programs based on that sample, *3D Pipes* contains only organ sounds as you would hear them in the organ's hall. Every sound has two layers, each in stereo, with the organ in the first layer and the reverb in the second.

The sounds come in 23 files, ranging from 10 to 21 MB in size. The file names are generic, so you'll need to open a file to see which drawbar setting you're loading. Six setups for "four manuals plus pedals" performances are available in Set-Up mode. The amount of RAM designated for five of these setups exceeds the K2000's maximum of 64 MB by a considerable margin, however, so you'll need two K2000s for this. With one K2000 you can load in a bass-pedal file and two manuals and still get an adequate organ performance.

### Put This in Your Pipe

The pipe organ is a forerunner of the synthesizer. Even today, synths use "pipe lengths" to define oscillator octave settings; 2 feet, 4 feet, and so on. Some organ settings were designed to emulate real instruments, such as flute, cornet, trumpet, tuba, and English horn.

*3D Pipes'* Flaute Mirabilis 8' is a fat, flutelike stop with a calliopolike edge. The 8' Bassoon Haute Bois is a favorite of mine, providing the reedy timbre of a bassoon. The 8' Trompette en Chambarde is bright with a spitlike attack, and Tuba Mirabilis sounds deep and rich. The 32' Coupled Sub Bass is thunderous.

Actual 3-D sound requires a surround-sound speaker configuration; nonetheless, when I was listening to this CD-ROM, I felt as if I were in a real acoustic setting.

At first I wondered how the sampled Baylor hall reverbs would blend in when played in another hall. Fortunately, the reverbs are in a separate layer and can be turned off. I replaced the organ keymap with the K2000's preset Trombone keymap, and after a little tweaking I had a juicy, natural-sounding reverb without using the internal effects.

### Stop-Making Sense

I'm not a fan of preset pipe-organ sounds on synths and samplers, but this CD-ROM gave me a new perspective, and I thoroughly enjoyed its rich palette of pipe timbres.

*3D Pipes* will work for any venue that can't afford the real thing, but not without a few compromises. The stops are plentiful enough to sate almost any pipe organist, but the immediacy of changing sounds by pulling drawknobs on the fly isn't available. You have to wait for sounds to load from hard disk if you want to change timbres, so some forethought is necessary.

Of the CD-ROMs I've reviewed, *3D Pipes* is the first to give me a genuine sense of being in the room with an instrument. Virtual Reality did an excellent job of capturing the sound of this powerful keyboard. If you're a pipe organist or composer who wants the genuine article, I heartily recommend that you give *3D Pipes* a listen.

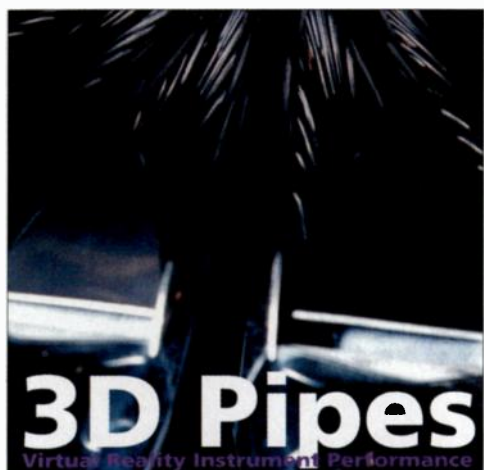
Overall EM Rating (1 through 5): 4.5

## STEINBERG

Model-E 1.0 (Mac/Win)

By Erik Hawkins

Steinberg's latest virtual synth, *Model-E* (Mac/Win; \$199), bears a remarkable resemblance to the Minimoog Model D, from



Virtual Reality Sound painstakingly and convincingly captured the majestic pipe organ on its *3D Pipes* sample CD-ROM, which is available in E-mu E4, Kurzweil K2000, and NemeSys GigaSampler formats.

emerged in medieval Europe and developed through the Renaissance into the familiar versions of today.

Found in churches, concert halls, and theaters, pipe organs can be quite a sight and sound to behold. They have multiple keyboards (manuals), numerous stops (drawbars that set the timbre), bass pedals, and huge arrays of pipes (the length of which determines pitch). *3D Pipes* (\$399) captures this majestic instrument in a natural acoustic setting. The samples are on CD-ROM in the Kurzweil K2000, E-mu E4, and NemeSys GigaSampler formats.

### Organic Sound Gardening

The producers gathered chromatic samples of 30 stops—including the blower—



Steinberg's latest VST Instrument, *Model-E*, is a multitimbral, polyphonic virtual synthesizer with automatable controls. Its "front panel" resembles that of a Minimoog Model D analog synthesizer.



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the front-panel layout down to the color scheme and the overall look of its knobs and switches. However, unlike the Mini-moog, *Model-E* is a polyphonic, multitimbral instrument that can generate up to 16 different sounds at once, just like a modern MIDI sound module.

Like other VST Instruments, *Model-E* is available for Mac and Windows computers. Both versions come on the same CD-ROM, which is very handy if you work with both platforms. Installation is a piece of cake; you run the installer program, and the plug-in appears in your VST plug-ins folder.

### Take One

*Model-E* sports five sound banks, each with 128 patches (including presets and user-definable patches). The presets are well conceived and range from pads and basses to percussion and effects. Auditioning presets is easy, thanks to a large 3-digit display and increment and decrement buttons.

Banks and individual patches are easily saved and recalled directly from the VST Instrument rack. Copy and Paste buttons make swapping settings between patches a snap, and a Compare function allows you to review your changes.

### Shaping Sounds

*Model-E* is neatly divided into four distinct sections: Controller, VCO, Mix, and ADSR. The Controller section includes virtual knobs for controlling the modulation mix, glide, and tuning, and switches for controlling oscillator modulation and monophonic playback.

The VCO section has three oscillators, each with six waveforms, a 6-octave range, and a dedicated volume control. Oscillator 3 can function as an LFO for controlling the filter and the VCF and VCA envelopes. White and pink noise can be mixed to taste with the oscillators.

In the Mix section, you can choose either a 2-pole or 4-pole filter and shape it from the filter stage in the ADSR section. The six adjustable filter controls are Cut Off, Emphasis, Amount, Attack, Decay, and Sustain. By contrast, the VCA envelope has only three adjustable stages: Attack, Decay, and Sustain. You control Release with an on/off switch.

All of *Model-E*'s dials, sliders, and switches can be controlled using MIDI Control Change messages. Alternatively, if you set Steinberg's *Cubase VST* to receive System Exclusive data, you can automate movements made directly on

*Model-E*'s face (say, with a mouse) using the VST Channel Mixer. While we're on the subject, MIDI channels are assignable to any of four stereo outputs in the VST Channel Mixer for processing.

### Dial E for Excellent

*Model-E* has a maximum polyphony of 64 notes; the amount depends on your CPU. I squeezed about 12 voices out of my Mac G3/266 MHz, and almost 24 from my Pentium II/450 MHz before overloading the CPU. Latency on the Mac is barely noticeable, but it's much greater on the PC.

*Model-E* didn't sound quite as fat through my Digidesign 1622 I/O as my Mini-moog does, but it was still impressive. (Sound quality will, of course, vary according to the sound card you use.) With a little EQ and some VST effects, *Model-E* rocks. The fact that it's polyphonic and multitimbral makes it flexible, powerful, and much more convenient than other VST Instruments. With a price tag of \$199, this plug-in is tough to beat.

Overall EM Rating (1 through 5): 4.5

## AURALEX ACOUSTICS

### Max-Wall

By Barry Cleveland

So you put together a nifty little personal studio in your extra bedroom. You have a nice new mixer, a great recorder, some slammin' monitors, expensive microphones, and numerous racks of other stuff. Everything is hooked up and running when you realize that you're facing some problems.

You notice that your oh-so-sensitive condenser mic picks up every little sound in the room—as well as the sound of the room itself—and all the sounds are bad. At least you think they are, but you can't be sure because the sound of your monitors changes radically as you move about in the room. You complete some mixes, only to find that they sound completely different when played back on other people's speakers.

You don't have thou-

sands of dollars to spend on a full-blown acoustic-treatment system, and you couldn't install one anyway because you rent the house and can't permanently affix materials to the walls and ceiling. Egad! What are you going to do?

Enter the ingenious Auralex Acoustics Max-Wall modular acoustic environment (\$349).

### Max-Wall Smart

*Max* is an acronym for Mobile Absorptive eXpandable, and the Max-Wall acoustic-treatment system is both mobile and modular. By mounting 48-by-20-by-4.375-inch absorbent panels on easily movable tripod stands, Auralex has created one of those solutions that should have been obvious to everyone all along.

Each Max-Wall panel has a hole that runs through it from top to bottom, enabling you to place the panel over the stand. A stand can take up to three panels. Once you've positioned the panels at the desired height, you keep the stack in place by attaching a clamp to the stand just below the lowest panel.

Additionally, each panel has a 20-inch "male" molding on one side as well as a 20-inch "female" molding on the other, both covered with squared-off end caps. When you remove the caps, you can connect adjacent panels to form longer panels (8 feet, 12 feet, 16 feet, and so on). A flexible component next to the center hole allows you to bend individual panels at a 45-degree angle to form corner panels.

You can place the panels around a mixing area to form a tight acoustic space. Set them against one or more walls for general sound control, or use them to



The Max-Wall from Auralex Acoustics is a mobile, fully modular, acoustic-treatment system that's literally off-the-wall. The system is shown here with an optional vocal window panel.



create a pseudo-isolation booth for recording acoustic instruments or vocals.

An optional window unit (\$99) is available for the latter application; it contains a 12-by-18-inch Plexiglas window and can be used with a gooseneck microphone attachment, making it a key component in an ad hoc vocal booth.

Sold by the box, Max-Wall comes with four panels and two tripod stands. The stands, which resemble microphone stands, come with 18-inch extensions for raising really high Max-Walls.

### Absorb This

I requested three Max-Wall boxes, so I received 12 panels and 6 stands. The easy-to-follow instructions made setting up the stands and sliding the panels over them a piece of cake. I quickly had four stacks of three panels. I put one stack directly behind the table holding my mixer, monitors, and some outboard gear. I placed the others on my right, my left, and behind me, creating a square-shaped space about eight feet across.

This arrangement essentially engulfed the monitoring and mixing area and resulted in too much absorption. The panels sucked all of the life—actually, the highs and high-mids—out of the recordings played. Although the idea of an acoustically dead room holds a certain theoretical appeal, it proved unworkable in practice.

I moved the panels around and received the best results from a square arrangement about 14 feet across, with fairly large spaces between the panels. The Max-Walls work very well, and a little bit of absorption goes a long way. This setup gave me the ideal balance of live and dead characteristics that I needed.

I also used three stacks of panels to form a recording space. They provided a surprising amount of sound insulation (keeping out unwanted noises) and damped the reflections of the instruments I recorded, channeling their sound directly into the microphone. I also found that by placing a single panel over a window, I could significantly reduce the ambient sound in the room. Now that's absorption!

### Lowdown

If you can relate to any of the problems I mentioned in the opening paragraphs, you owe it to yourself to check out the Max-Wall. While you're at it, look into the stand-mounted versions of Auralex's Lenrd (Low-End Node Reduction Device)

bass traps (\$319 for a box of four). They'll help you keep the other end of the aural spectrum under control. Who knows, Max and Lenrd may just become your new sound guys.

**Overall EM Rating (1 through 5): 4.5**

## DISCOVERY FIRM

### The Legend of China

By Gerry Bassermann

Discovery Firm's *The Legend of China* (audio CD; \$99.95) is a two-disc set of Chinese instrument and vocal samples, including idiomatic styles and phrases. Musical phrases fill the first disc. The second disc contains 18 sound effects: environmental ambiences, ensemble musical settings, and television and radio samples. Rounding out the collection are individual note samples and playing techniques for the instruments on the first disc.

### Use the Source

The instrument sources fall into four categories: stringed instruments, wind instruments, percussion, and vocals. All the sounds are exquisite, featuring plucked strings, slippery bowed strings, and wind tonalities that I have never heard before.

The musical phrases are expert and enchanting. Film and video composers will find a lot of material here; you can use the phrases to add Chinese sounds to basic tracks. The sound effects will appeal to sound designers, as they provide more than 16 minutes of background recordings, full of authentic interior and exterior sounds. The phrases with periodic rhythmic events offer remixers and arrangers rare sources of groove textures.

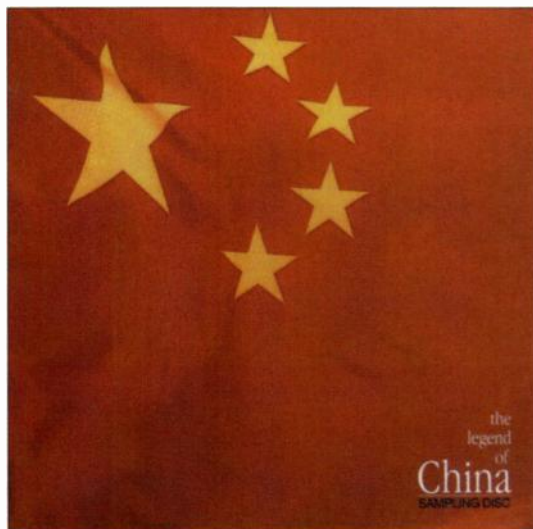
For the truly adventurous, the vocal recordings take the spoken word into the next dimension. I laid a beat under the first Jing Ju vocalization and discovered that I'd never heard anything quite like it. I wondered about what was actually being said (the booklet contains no English translation), but for the most part I didn't care because it sounded so cool.

### Real Deal

I applaud the inclusion of riffs and phrases because it's difficult to emulate the sounds of these instruments by playing multisamples mapped to a keyboard. A number of idiomatic articulations inherent in Chinese music, especially continuous pitch change, cannot be duplicated with keyboard technique alone.

The best way to create a convincing and authentic track is to use both phrases and single samples. However you choose to work, the musical phrases on disc 1 offer excellent aural demonstrations of the playing styles unique to each instrument.

Documentation for *The Legend of China* is brief and to the point. Each track listing includes information on tempo, length, and key, as well as a photo of



With Discovery Firm's *The Legend of China* sample-CD set, you can import a collection of Chinese sounds—instruments, voices, and ambient sound effects—into your studio.

each instrument. Original pitches are indicated for each sample.

### Noise Factor

A few areas could stand improvement. For one, I noticed some clipping in the samples. Also, the samples have a small component of noise that is only audible on single samples heard through headphones, but more obvious as you play polyphonic chords on the sampler.

Overall, however, the tonal quality of the recordings is very good. *The Legend of China* is a complete, well-conceived CD set for those with fresh sounds on their minds. ☺

**Overall EM Rating (1 through 5): 4**

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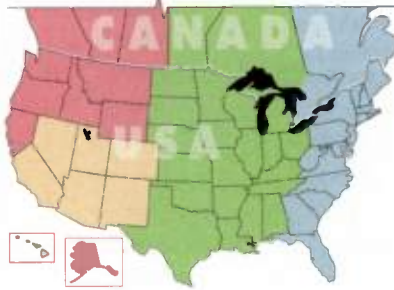
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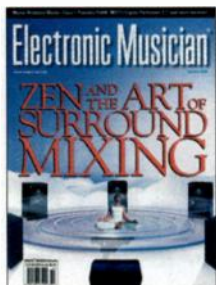
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## DIGITAL MULTI-TRACK RECORDERS

### TASCAM

### MX-2424 24-Bit 24-Track Hard Disk Recorder

Co-designed by TASCAM and TimeLine Inc., the MX-2424 is an affordable 24-bit, 24-track hard disk recorder that also has the editing power of a digital audio workstation. A 9GB internal hard drive comes standard as well as a SCSI Wide port that supports external LVD (Low Voltage Drives) hard drives from up to 40 feet away. An optional analog and several digital I/O cards are available so the MX-2424 can be configured to suit your work environment. SMPTE synchronization, Word Clock, MIDI Time Code and MIDI Machine Control are all built in for seamless integration into any studio.



- Records 24 tracks of 24-bit audio at 44.1 or 48 kHz, or 12 tracks at 88.2 or 96 kHz. Up to 24 tracks can be recorded simultaneously using any combination of digital and analog I/O.
- Supplied 9GB internal drive allows 45 minutes of audio across all 24 tracks
- Wide SCSI port on the back panel allows you to add multiple drives. A front 5-1/2" bay available for installing an additional drive, or an approved DVD-RAM drive for back-up.
- ViewNet MX, a Java-based software suite for Mac and PC offers DAW style editing of audio regions, dedicated system set-up screens that make set-up quicker and easier and track load screens that make virtual track management a snap. Connects to a computer via a standard Ethernet line.
- Can record to Mac (SDII) or PC (.WAV) formatted drives, allowing later export to the computer. The Open TL format allows compatible software to recognize virtual tracks without have to load, reposition and trim each digital file.
- Transport Controls-**
  - Jog/scrub wheel
  - MIDI In, Out, and Thru ports are built-in for MIDI Machine Control.

#### Editing-

- Built-in editing capabilities include cut, copy, paste, split and ripple or overwrite
- 100 levels of undo
- Supports destructive loop recording and non-destructive loop recording which continuously records new takes without erasing the previous version.

#### Build-In Synchronization-

- TBUS protocol can sample accurately lock 32 machines together for 384 tracks at 96kHz, or 768 tracks at 48kHz.
- Can generate or chase SMPTE timecode or MIDI Time Code.
- Word Clock In, Out, and Thru ports

#### I/O Options-

- Optional analog and digital cards all provide 24 channels of I/O. There is one slot for analog and one for digital.
- IF-TD24: T-DIF module
- IF-AD24: ADAT Lightpipe module
- IF-AE24: AES/EBU module
- IF-AN24: A-D, D-A I/O module with DB-25 connectors

#### Software Updates-

- System updates are made available through a front panel Smart Card slot or via computer directly from the TASCAM web site.

### DA-78HR Modular Digital Multitrack

The DA-78HR is the first true 24-bit tape-based 8-track modular digital multitrack recorder. Based on the DTRS (Digital Tape Recording System) it provides up to 108 minutes of pristine 24-bit or 16-bit digital audio on a single 120 Hi-8 video tape. Designed for project and commercial recording studios as well as video post and field production, the DA-78HR offers a host of standard features including built-in SMPTE Time Code Reader/Generator, MIDI Time Code synchronization and a digital mixer with pan and level controls. A coaxial S/PDIF digital I/O allows pre-mixed digital bouncing within a single unit, or externally to another recorder or even a DAT or CD recorder. Up to 16 DTRS machines can be synchronized together for simultaneous, sample accurate control of 128 tracks of digital audio.



#### Features-

- Selectable 16 bit or 24 bit High Resolution audio
- 24 bit A/D and D/A converters
- >104dB Dynamic range
- 20Hz - 20kHz frequency response  $\pm 5$ dB
- 1 hr. 48 min. recording time on a single 120 tape
- On-Board SMPTE synchronizer - chase or generate timecode
- On-Board support for MIDI Machine Control
- Internal digital mixer with level and pan for internal bouncing, or for quick mixes
- Track slip from ~200 to ~7200 samples
- Expandable up to 128 tracks (16 machines)
- Word Sync In/Out/Thru
- Analog output on DB25 balanced or RCA unbalanced
- Digital output on TDIF or 2 channels of S/PDIF

## CD RECORDERS & DUPLICATORS

### MICROBOARDS

### StartREC Digital Audio Editing/ CD Duplication System

The Microboards StartREC is the first digital audio editing system combined with a multitrack CD recordable duplication system for professionals. Audio is recorded to the internal 6.2 GB IDE hard drive using analog or digital inputs. Sample rate conversion is automatic. Tracks can be edited and sequenced using the StartREC's user friendly interface and up to 4 CDs can be recorded simultaneously. StartREC is the ideal solution for studio recording, mastering, post production or any pro audio environment requiring digital audio editing and short run CD-R duplication.



#### Features-

- 2X, 4X, or 8X recording speeds
- 6.2GB IDE hard drive
- Editing functions include move, divide, combine or delete audio tracks, add or drop any index or sub index, and create track fade in or fade out
- Coaxial S/PDIF or AES/EBU digital input plus optical S/PDIF I/O
- XLR balanced and RCA Line inputs and outputs
- Automatic sample rate conversion from 32 and 48kHz
- Automatic CD Format Detection feature and user friendly interface provide one touch button operation
- Front panel trim pot and LCD display provide accurate input signal and time lapse metering
- SCMS (Serial Copy Management System) is supported, regardless of the source disc copy protection status
- StartREC Models Include:** ST2000 (2) 8x writers, ST3000 (3) 8x writers and ST4000 (4) 8x writers

## DIGITAL MIXERS

### Roland

### VM Basic 72 Digital Mixing System

The all digital Roland V-Mixing System, when fully expanded, is capable of mixing up to 94 channels with 16 stereo (32 mono) onboard multi-effects including COSM Speaker Modeling. Utilizing a separate-component design, comprised of the VM-C7200 console and VM-7200 rackmount processor, allows the V-Mixing System to be configured to suit your needs. Navigation is made easy via a friendly user interface, FlexBus and EZ routing capabilities as well as a large informative LCD and ultra-fast short cut keys.



#### Features-

- 94 channels of digital automated mixing (fully expanded)
- Up to 48 channels of ADAT/Tascam T-DIF digital audio I/O with optional expansion boards and interfaces
- Separate console/processor design
- Quiet motorized faders, transport controls, total recall of all parameters including input gain, onboard mixer dynamic automation and scene memory
- 24 fader groups, dual-channel delays, 4-band parametric channel EQ + channel HPF
- FlexBus and "virtual patchbay" for unparalleled routing flexibility

#### Options-

- VS8F-2 Effects Expansion Board** -- Provides 2 stereo effects processors including COSM Speaker Modeling. Up to 3 additional boards can be user-installed into the VM-7200 processor, for 8 stereo or 16 mono effects per processor.
- VM-24E I/O Expansion Board** -- Offers 3 R-Bus I/Os on a single board. Each R-Bus I/O provides 8-in/8-out 24-bit digital I/O, totalling 24 I/O per expansion board.

- Up to 16 stereo (or 32 mono) multi-effects processors using optional VS8F-2 Effects Expansion Boards (2 stereo effects processors standard)
- COSM Speaker Modeling and Mic Simulation technology
- 5.1 Surround mixing capabilities
- EZ Routing allows mixer settings to be saved as templates
- Realtime Spectrum Analyzer checks room acoustics in conjunction with noise generator and oscillator
- Digital cables between processor and mixer can be up to 100 meters long - ideal for live sound reinforcement.

- DIF-AT Interface Box for ADAT/Tascam** -- Converts signals between R-Bus (VM-24E expansion board required) and ADAT/Tascam T-DIF. Handles 8-in/8-out digital audio. 1/3 rackmount size.
- VM-24C Cascade Kit** -- Connects two VM-Series processor units. Using two VM-7200 processors cascaded and fully expanded with R-Bus I/O, 94 channels of audio processing are available.

## EFFECTS PROCESSING

### Lexicon

### MPX-500 24-Bit Dual Channel Effects Processor



The MPX 500 is a true stereo 24-bit dual-channel processor and like the MPX100 is powered by Lexicon's proprietary Lexipch and offers dual-channel processing. However, the MPX 500 offers even greater control over effects parameters, has digital inputs and outputs as well as a large graphics display.

- 240 presets with classic, true stereo reverb programs as well as Tremolo, Rotary, Chorus, Flange, Pitch, Detune, 5.5 second Delay and Echo
- Balanced analog and S/PDIF digital I/O
- 4 dedicated front panel knobs allow adjustment of effect parameters. Easy Learn mode allows MIDI patching of front panel controls.
- Tempo-controlled delays lock to Tap or MIDI clock

### t.c. electronic

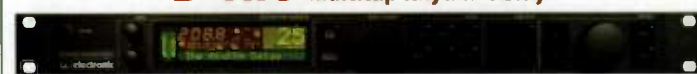
### M-One Dual Effects Processor



The M-One allows two reverbs or other effects to be run simultaneously, without compromising sound quality. The intuitive yet sophisticated interface gives you instant control of all vital parameters and allows you to create awesome effects programs quickly and easily.

- 20 incredible TC effects including: Reverb, Chorus, Tremolo, Pitch, Delay and Dynamics
- Analog-style user interface
- 100 Factory/100 User presets
- Dual-Engine design
- 24 bit A/D-D/A converters
- S/PDIF digital I/O, 44.1-48kHz I/O
- Balanced 1/4" Jacks - Dual I/O
- 24 bit internal processing

### D-Two Multitap Rhythm Delay



Based on the Classic TC2290 Delay, the D-Two is the first unit that allows rhythm patterns to be tapped in directly or quantized to a specific tempo and subdivision.

- Multitap Rhythm Delay
- Absolute Repeat Control
- Up to 10 seconds of Delay
- 50 Factory/100 User presets
- 24 bit A/D-D/A converters
- S/PDIF digital I/O, 44.1-48kHz
- Balanced 1/4" Jacks - Dual I/O
- 24 bit internal processing



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## MICROPHONES

B&H is proud to announce that we are now dealers for RØDE microphones and all other Event products.

### RØDE NT-2 Condenser Mic

The RØDE NT2 is a large diaphragm true condenser studio mic that features both cardioid and omnidirectional polar patterns. The NT-2 offers superb sonic detail with a vintage flavor for vocal and instrument miking. Like all RØDE mics the NT-2 is hand-assembled in Australia and is available at a breakthrough price.

#### Features

- Dual pressure gradient transducer
- Large diaphragm (1") capsule with gold-sputtered membranes
- Low noise, transformerless circuitry
- Omni and cardioid polar patterns
- High pass filter switch

- -10dB pad switch
- 20Hz-20kHz frequency response
- 135dB Max SPL
- Gold plated output connector
- Gold plated internal head pins
- Shockmount, Flight Case, and Pop Filter included



### SHURE KSM-32SL Cardioid Condenser Mic



The reviews are raving about Shure's new "classic" microphone. The KSM32 features Class A, transformerless preamplifier circuitry, low self-noise and increased dynamic range, all necessary for critical studio recording. It has a 15 dB attenuation switch for handling high SPLs, making it suitable for a variety of sound sources including vocals, acoustic instruments, ensembles and overhead miking of drums and percussion. For studios, the KSM32/SL has a light champagne finish and includes an aluminum carrying case, shock and swivel mounts and a velvet pouch. For live applications, the KSM32/CG has a charcoal grey finish and includes a swivel mount and padded zipper bag.

- Frequency response 20Hz - 20kHz



### C4000B Electret Condenser Mic

This new mic from AKG is a multi polar pattern condenser microphone using a unique electret dual large diaphragm transducer. It is based on the AKG Solid Tube design, except that the tube has been replaced by a transistorized impedance converter preamp. The transformerless output stage offers the

C4000B exceptional low frequency response.

#### FEATURES-

- Electret Dual Large Diaphragm Transducer (1st of its kind)
- Cardioid, hypercardioid & omnidirectional polar patterns
- High Sensitivity

- Extremely low self-noise
- Bass cut filter & Pad switches
- Requires 12, 24 or 48 V phantom power
- Includes H-100 shockmount and wind/pop screen
- Frequency response 20Hz to 20kHz



### AM-61 Cardioid Tube

The GT Electronics AM61 offers classic tube performance in a fixed cardioid, large diaphragm condenser mic. An outstanding addition to any project studio or large commercial recording facility seeking rich, warm tube sounds and unsurpassed value.

- Groove Tubes military-spec GT5840M vacuum tube preamplifier
- Large-diameter, super-thin 3 micron gold evaporated Mylar diaphragm
- Fixed cardioid polar pattern response
- Switchable -10dB attenuation pad and 80Hz low frequency roll-off filter
- Includes hard-shell case, shock mount, hard mount, 6-pin cable and external power supply
- Frequency response 20Hz - 20kHz

• ALSO AVAILABLE AM-62 multipattern tube condenser mic



audio-technica.

### AT4047SV Cardioid Condenser Mic

The AT4047 is the latest 40 Series large diaphragm condenser mic from Audio Technica. It has the low self noise, wide dynamic range and high sound pressure level capacity demanded by recording studios and sound reinforcement professionals.

- Side address cardioid condenser microphone for professional recording and critical applications in broadcast and live sound
- Low self noise, wide dynamic range and high SPL
- Switchable 80Hz Hi Pass Filter and 10dB pad
- Includes AT8449/SV shockmount
- Also Includes a limited edition tweed flight case while supplies last!



## STUDIO MONITORS

### VERGENCE A-20 Studio Reference Monitor System



Incorporating a pair of 2-way, acoustic suspension monitors and external, system-specific 250 watt per side control amplifier, the A-20 provides a precise, neutral studio reference monitoring system for project, commercial and post production studios. The A-20's control amplifier adapts to any production environment by offering control over monitoring depth (from near to far field), wall proximity and even input sensitivity while the speakers magnetic shielding allows seamless integration into today's computer based studios.



- Type Modular, self-powered near/mid/far-field monitor.
- 48Hz - 20kHz frequency response @ 1M
- Peak Acoustic Output 117dB SPL (100ms pink noise at 1M)
- XLR outputs from power amp to speakers
- Matched impedance output cables included.

- -6dB LF Cutoff 40Hz
- 5 position wall proximity control
- 5 position listening proximity control between near, mid and far-field monitoring
- Power, Overload, SPL Output, Line VAC and Output device temperature display.

#### Amplifier

- Amplifier Power 250W (continuous rms/ch), 400W (100ms peak)
- XLR, TRS input connectors
- Headphone output
- 5-position input sensitivity switch with settings

#### Speakers

- 2-way acoustic suspension with a 6.5-inch treated paper woofer and a 1-inch aluminum dome tweeter
- Fully magnetically shielded with an 18-inch recommended working distance



### PS-5 Bi-Amplified Project Studio Monitors

The PS-5s are small format, full-range, non-fatiguing project studio monitors that give you the same precise, accurate sound as the highly acclaimed 20/20 series studio monitors. The use of custom driver components, complimentary crossover and bi-amplified power design provides a wide dynamic range with excellent transient response and low intermodulation distortion.

#### FEATURES-

- 5-1/4-inch magnetically shielded mineral-filled polypropylene cone with 1-inch diameter high-temperature voice coil and damped rubber surround LF Driver
- Magnetically shielded 25mm diameter ferrofluid-cooled natural silk dome neodymium HF Driver
- 70 watt continuous LF and 30 watt continuous HF amplification per side

- XLR-balanced and 1/4-inch (balanced or unbalanced) inputs
- 52Hz-19kHz frequency response  $\pm 3$ dB
- 2.6kHz, active second order crossover
- Built-in RF interference, output current limiting, over temperature, turn-on transient, subsonic filter, internal fuse protection
- Combination Power On/Clip LED indicator
- 5/8" vinyl-laminated MDF cabinet



### KRK V-6 Bi-Amplified Near Field Studio Monitors



These bi-amped studio monitors from KRK supply 90 watts of clean power. Their 6-inch woofer & 1-inch silk dome tweeter ensure consistency from top to bottom with crystal clear highs and a solid bass response.

#### FEATURES-

- 58Hz - 22kHz frequency response
- 1-inch silk dome tweeter and 6-inch long stroke, polyvinyl woofer
- 30 Watt HF & 60 Watt LF amplification
- Magnetically shielded
- Variable system gain +6dB -30dB
- Neutrik XLR1/4" TRS combo connector

#### Also Available- V-8

- 1-inch Silk Dome tweeter and 8-inch Woven Kevlar woofer
- 47Hz - 23kHz frequency response
- 60 Watt high frequency and 120 Watt low frequency amplification
- HF adjust +1dB, Flat, -1dB
- LF adjust -3dB at 45, 50 and 65 Hz

## Hafler

### TRM-6 Bi-Amplified Near Field Studio Monitors

Offering honest, consistent sound from top to bottom, the TRM-6 bi-amplified studio monitors are the ideal reference monitors for any recording environment whether tracking, mixing or mastering. Supported by Hafler's legendary amplifier technology that provides a wide and accurate sound field, in width, height and also depth.

#### FEATURES-

- 33 Watt HF & 50 Watt LF amplification
- 1-inch soft dome tweeter and 6.5-inch polypropylene woofer
- 55Hz - 21kHz Response
- Magnetically Shielded
- Electronically and Acoustically Matched

#### Also Available- TRM-8

- 1-inch soft dome tweeter and 8-inch polypropylene woofer
- 45Hz - 21kHz frequency response  $\pm 2$ dB
- 75 Watt HF, 150 Watt LF amplification





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## COMPUTER BASED DIGITAL AUDIO SYSTEMS

### MOTU AUDIO Hard Disk Recording Systems

The MOTU Audio System is a PCI based hard recording solution for the Mac and PC platforms. At the heart of the system is the PCI-324 PCI card that can connect up to three audio interfaces and allows up to 72 channels of simultaneous I/O. Audio interfaces are available with a wide range of I/O configurations including multiple analog I/O with the latest 24-bit A/D/A converters and/or multi channel digital I/O such as ADAT optical and TDFIF I/O as well as standard S/PDIF and AES/EBU I/O. Each interface can be purchased separately or with a PCI-324 card allowing you to build a system to suit your needs. Includes drivers for all of today's hottest audio software and AudioDesk, multitrack recording and editing software for the Mac.

**KEY ALL FEATURE—** Mac OS and Windows compatible software drivers for compatibility with all of today's popular audio software. AudioDesk, MOTU's sample-accurate audio restoration software for Mac OS • Host computer determines the number of tracks that the software can record and play simultaneously, well as the amount of real-time effects processing it can support. Soft panels display metering for all inputs and outputs

• **AudioDesk Audio Workstation Software** for Mac OS features 24-bit recording, multi-channel waveform editing, automated virtual mixing, graphic editing of ramp automation, real-time effects plug-ins with 32-bit floating point processing, crossfades, support for third-party audio plug-ins (in the MOTU Audio System and Adobe Premiere formats), background processing of file-based operations, sample-accurate editing and placement of audio, and more



**408 KHz FEATURES—** 7 banks of 8 channel I/O: 1 bank of analog, 3 banks of ADAT optical, 3 banks of standard TDFIF, plus stereo S/PDIF • Custom VLSI chip for blazing I/O capabilities • Format conversion between JAT and DA-88

• 8x 24-bit 1/4" balanced analog I/Os • 24-bit internal data bus for full 24-bit recording via digital inputs • Standard S/PDIF I/O for digital plus an additional S/PDIF I/O for the main mix • Sample-accurate synchronization with ADATs and DA88s via an ADAT SYNC IN and RS422



**224 FEATURES—** 24-bit analog audio interface • State-of-the-art 24-bit A/D/A • Simultaneously record and play back 8 channels of balanced (TRS) • 4x dB audio • 1-bit balanced 4x XLR main outputs • Stereo AES/EBU

digital I/O • Word clock in/out • Dynamic range of 118 dB (A-weighted) • Front panel displays six-segment metering for all inputs and outputs • Headphone jack with volume knob



**08 Features—** 8 channels of coaxial S/PDIF using 4 CA input and 4 RCA output connectors • 8 channels of optical S/PDIF using 4 Toslink input and 4 Toslink output

connectors • 8 channels of AES/EBU using 4 XLR male and 4 XLR female connectors • Word Clock I/O allows the 308 to synchronize with digital audio environments



**41 Features—** 24 high quality, 24-bit analog outputs • Balanced 1/4" analog outputs • Optical and coaxial S/PDIF outputs • Front panel headphone output

with level control • Word Clock I/O • Connect up to three 241 rack I/Os to a PCI-324 audio card for a total of 72 inputs and six outs

Also available with MOTU's award-winning Digital Performer audio sequencer software package

## SOFTWARE

### Digital Performer 2.7 MIDI/AUDIO Software for Mac

Digital Performer is an integrated multitrack digital audio and MIDI sequencing program packed with advanced tools for a wide variety of audio applications. Sample accurate editing, loop based audio capture, real-time DSP effects and the best MIDI timing/resolution available insures unlimited creative potential.

#### FEATURES—

Includes over 50 real-time MIDI and audio effects plug-ins • POLAR window - which provides interactive audio recording • 24-bit recording and editing • 32-bit time effects processing - incredible sounding EQ and other FX • 64-bit MasterWorks Limiter and Multiband compressor plug-ins included • Sample-accurate - the only reliable waveform editing and tightest sync you can get • Samplers window - drag & drop samples between your Mac and your Sampler • PureDSP stereo pitch-bending and time-stretching • Unlimited audio tracks, real-time editing, full automation and remote control • QuickTime digital video support

#### NEW FEATURES—

• Full Plug-In FX automation and increased 3rd party Plug-in support • Drum Editor • Adjustable Display Resolution from 2 to 10,000 PPO. Tick values up to four decimal places can be set allowing 1000 times greater editing resolution. For example, if you are used to editing MIDI data at 480 PPO, you can set your edit resolution to 480,000 for 1000 times more precision. • MIDI Time Stamping (MTS) which exists in MOTU's rack-mountable USB MIDI interfaces, delivers MIDI data from Digital Performer to MIDI devices as accurately as a third of a millisecond for every single MIDI event.



### ANTARES

### AMM-1 Microphone Modeler

The AMM-1 Microphone Modeler uses patented technology to create precise digital models of a wide variety of microphones, from historical classics to modern exotics and even industry-standard workhorses. Simply tell the Microphone Modeler what microphone you are actually using and what microphone you'd like it to sound like. It's as simple as that. Available as a plug-in for the TDM and MAS environments, with DirectX and Mac VST not far behind.

#### FEATURES—

• Proprietary DSP-based acoustic modeling allows any reasonable quality microphone to sound like any of a wide variety of high-end studio mics • Models reproduce the effects of windscreens, low-cut filters, pattern-dependent frequency response and proximity effects • Create hybrid mics that combine the bass response of one mic with the treble response of another

• Add a model of classic tube saturation distortion • Use during mixdown to change the mic on an already recorded track • Incredibly simple to use - simply select the mic you're using and the mic you want it to sound like • Includes an extensive collection of digital models of historical classics, modern exotics, and industry-standard workhorses • Additional models can be downloaded from the Antares web site



### RC WORKS

ULTIMATE SOFTWARE MACHINES

### SPARK 1.5 2-Track Editing For Mac

Spark is professional 2-track audio editing software for the Power Macintosh that provides fast access to files and powerful processing tools. Supports files up to 24-bit/96kHz and has batch processing, VST plug-in support, as well as MP3 file export built-in. Audio can be extracted from a Quicktime movie, edited and then exported along with the video to a new file. Bundled with Adaptec's Toast so you can burn your audio directly to CD.



• Browser View- File database, audio editor and play list all in one easy to use display with movable border lines. Eliminates the need for surfing several windows to access and edit files. • Wave Editor- Perform off-line editing, processing, and create markers and non-destructive regions • Supports AIFF, Sound Designer, .WAV and QuickTime file formats. • DSP Processing Includes- Normalize, Reverse, Fades, Crossfades, and Sample Rate conversion and realtime

#### Time Stretching

• VST Plug-In compatible • Supports file swapping with most major samplers and any sampler that supports SMDI • Batch Processing • Bundled with Adaptec's Toast Pro you can burn your audio on CD • Extract audio from a Quicktime movie for editing and then export the audio along with the video into a new file • SPARK 1.5 supports MP3 audio authoring for the web directly from the file menu.

### WAVES

### Pro-FX Bundle Plug-ins For Mac or PC

The latest Bundle from Waves has some of the coolest sound design plug-ins available for the Mac and Windows platforms.

**SuperTap** - Six taps of mono or true stereo delay (up to Six seconds) • Global LFO modulation • 2 feedback modes • Q10-style filtering for each tap • rotation (stereo panning) • Delays are adjustable in milliseconds and note values • Tap out delay times or patterns using the Tap Pad  
**MetaFlanger** - Vintage tape-flanging, phaser-emulation, and special effects • True dual-delay flanging sounds • Wet signal include filters so you can flange or phase just part of the signal • Factory presets of vintage emulations (Motron, MXR, Icthycoo Park) and more.  
**MondoMod** - AM, FM, and Rotation (stereo panning) modulators • Gentle wandering guitar solo panning or bizarre destructive effects • Single LFO drives all modulators with independent phase offsets between the modulator signals.  
**UltraPitch** - Formant-corrected pitch shifter with 6-voices • Excellent gender-bending • Independent stereo panning and delay • Animator delay-randomizer. Set the pitchshift by musical intervals (with 5 cent resolution) • Manual formant mapping as well as presets that perfectly match instrumental formant responses • Creates huge and thick stereo chorusing, doubling, parallel harmonies, excellent vocal slap/spread effects, and much more  
**Enigma** - Mysterious and innovative, Enigma combines a complex notch filter, short delay feedback loops and modulation to create distinctive sound design effects.  
**Doppler** - Developed for post, film sound and game designers. Provides realtime doppler effects with auto and manual triggering modes, full control of air damping, panning pitch, path curve, gain, start/stop points and reverb tail.





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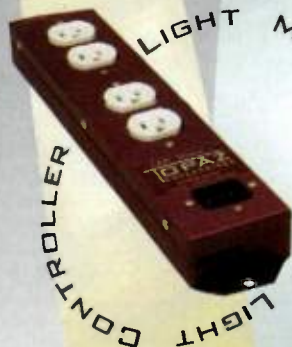
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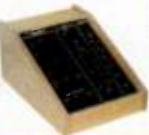


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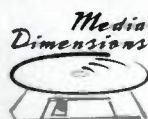
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## Where Ideas Come From

**W**here do ideas come from? Inspiration? Craft? Dumb Luck? Evolution? Fear? All of these, I think, separately and in combination. (Ideas surely come from many more places, but I'll just deal with these five at the moment.)

Inspiration is the most fun because coming up with ideas when inspired doesn't seem like work, and you are energized to pursue them. One of the best sources of inspiration is "dumb luck" or "happy accidents"—more poetically called "serendipity." The Beatles seized on happy accidents of all varieties. (Have you ever heard the story of why "Her Majesty" starts with a crashing chord and ends without the final tonic chord?) When inspiration strikes, ideas simply pop into your head, and you're off to the races. Whole songs or articles or sound effects have come flying out of me when my thoughts were piqued by something.

Regrettably, inspiration can't be generated, but it can be cultivated. A bowl of delicious ice cream, a dawn walk down the road, a poster of Jimi Hendrix hung in the control room during the mix—people find inspiration in all sorts of ways.

Craft is a very productive area for ideas, although it entails more work than inspiration. Craft can mean starting from a stated goal ("write a bossa nova," "make the sound of infinity turning inside out for this sci-fi movie") and figuring out how to get there, hammering out the kinks endlessly before reaching fruition. This is the perspiratory 98% of genius to which Edison referred. Craft is also a good means of cultivating inspiration. Sometimes you just start to do a thing, and ideas begin to flow.

Fear, of course, is an extremely powerful motivator. Hoo-ee dogies, deadlines *do* get the blood moving. Lots of people get their best ideas when working under pressure. Fear is also a dark source of ideas in the many people whose creative genius is matched only by the magnitude of imbalance in their lives. Unfortunately, it's



usually destructive as hell, but occasionally it can be worth it.

By evolution, I mean an idea that emerges over time. I have projects that start out as one thing but circumstances take a turn—and then I'm doing something totally unanticipated and absolutely cool. Another example of evolution is when you pick up a thread put down by someone else. No less than Igor Stravinsky said, "Good composers borrow; great composers steal." He sure was a slick thief: his music does not sound like a knockoff of other composers around him.

So how do these ideas about ideas look in action? Well, let me tell you a little about how the idea for this column came to be.

This month, I had a few ideas for my column I thought needed more development, so I wanted something else. I didn't know what that something else was until very shortly after EM editor Steve O. called to ask me if this month's "Final Mix" column was done. It's due tomorrow, I realized.

Time for me to scramble, because into my room just walked Fear. Driving home from my job at the monkey factory, my mind cast about frantically for an idea, just one good idea. Where could I find a good idea? Wait a minute...hold it...I think I'm on to something here!

From there, craft took over to develop the thought, as I pondered where ideas come from and devised the rough categorization I have described. As I filled out the idea, bits and pieces that had been kicking around for years, like the Beatles love of happy accidents, trotted out of the high grass and ran right up to me.

Ideas set the pulse racing—yours and the world's—but they are like precious spirits who will only help you if you seize them and take them on a ride. We must learn to recognize ideas when they manifest themselves, wherever they come from, so we can all go for a ride. ☺



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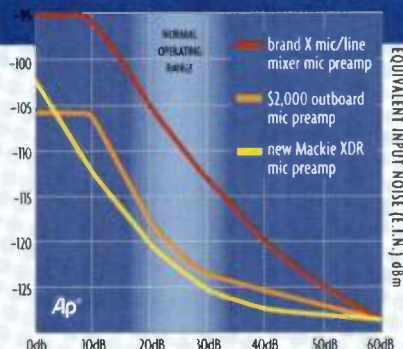
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XDR's Controlled Interface Input Impedance system accepts an enormous range of impedances without compromising frequency response. Whether the mic/cable load is 50 ohms, 150 ohms or 600 ohms, XDR mic preamp frequency response is down less than one tenth of a dB at 20Hz and 20kHz!

## Ultra-low noise at "Real World" gain settings.

Many mixers that tout low E.I.N. (Equivalent Input Noise) specs can't deliver that performance at normal +20 to +30dB gain settings. Graph A on the other page charts E.I.N. versus gain level for our new VLZ PRO Series vs. a major competitor's mic/line mixer preamps and a "status" outboard mic preamp retailing for about \$2,000. As you can see, our XDR design maintains lower noise levels in the critical +20 to +30 gain range than either competitor.

## There's still more:

- **0.0007% Total Harmonic Distortion.** The lowest ever in any compact mixer.
- **Flat response.** Not only are XDR mic

preamps flat within a tenth of a dB across the bandwidth of any known microphone, but are also only 3dB down at 10Hz and 192kHz!

- **116dB CMRR** 20Hz to 200kHz and above.
- **Super-low intermodulation distortion** at very high operating levels (charts B&C at left) thanks to instrumentation-style balanced differential architecture, linear biasing and use of DC-coupled pole-zero-cancellation constant current that frees the mic preamp from power supply fluxuations.

We could go on and on this way. But like we said at the start of this ad...

## Hearing is believing.

Visit your nearest Mackie Dealer. Select a really high-quality condenser mic and try out the new 1604-VLZ PRO, 1402-VLZ PRO and 1202-VLZ PRO. Think of them as expensive esoteric mic preamps...

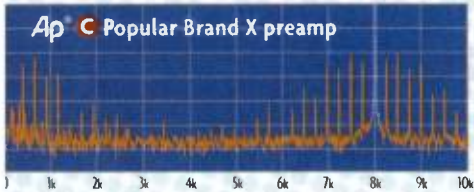
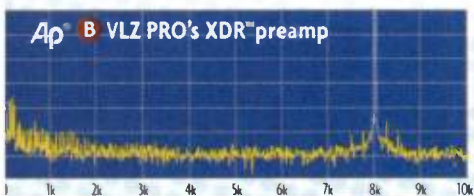
with really excellent compact mixers attached.

response. Second, we carefully-matched high-precision components for critical areas of the XDR preamplifier. Third, we direct-coupled the circuit from input to output and used pole-zero-cancellation constant current biasing (which also avoids increased intermodulation distortion at high signal levels).

Bottom line for the non-technical: Our new VLZ PRO Series has the best RFI rejection of any compact mixers in the world. Period.

## Controlled Interface Input Impedance.

If a mic preamp isn't designed right, it will actually sound different depending on



XDR vs. Brand X FFT analysis of mic preamp Intermodulation Distortion. Mixer trims at 30dB, 0dB at inserts. The white spike at 8kHz is the fundamental tone used to "generate" the surrounding distortion artifacts—which the Brand X mic preamp has far more of.

phones and pager transmitters—even microwave ovens—and amplify them to audible levels.

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**A:** Z-726 double tier "Z" stand with Z-728 boom and Z-732 music holder **B:** ZM-WS44\* mixer workstation - 44" wide (\*available in 34" width) and QL-400 locator stand **C:** QL-746 super heavy-duty "X" stand with QLX-2 second tier, QLX-3 third tier, QLX-4 boom and, QLX-5 music holder **D:** Z-WS71L keyboard workstation with Z-730 locator option (holding mixer) **E:** RS-954 20 space rack stand **F:** BS-317 low amp stand

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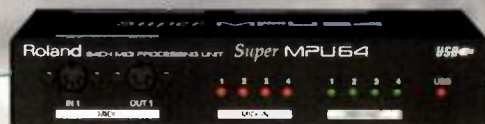
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# Production Notes

## MAKING ROOM

### AVOIDING THE TRAPS OF POOR ACOUSTIC DESIGN.

**D**ear Reader;

Welcome to the third edition of *Electronic Musician's Personal Studio Buyer's Guide*. I'm convinced that this year's guide will be the most useful ever, thanks to several important changes. To begin with, we have reorganized the charts into five sections, each with its own explanatory introduction. Some of the charts from last year's edition have been modified to present a more comprehensive resource, and we have added new charts that cover synthesizers and samplers, digital mixers, channel strips and voice processors, and more. The only charts we eliminated were recording and editing software and DSP plug-in software; these have been relocated to *EM's Desktop Music Production Guide*, which will be on sale this November at the same place where you found the issue that you are holding in your hands.

Once you have decided which products you want to use in your personal studio, you will need to focus on optimizing the room in which you will be working. Our three feature articles offer multiple perspectives on optimizing your space for maximum acoustic performance on a minimal budget. The approaches range from adaptations of techniques used in world-class studios to simple, do-it-yourself alternatives. Chris Pelonis, Geoff Goacher, Bob Hodas, JJ Jenkins, and *Mix* magazine editor George Petersen all contribute their views.

Another new addition is our Products & Services section, which features lots of great products and services of interest to personal-studio enthusiasts.

I would like to thank the fabulous team of people who made this publication possible. Assistant Editor Carl Weingarten contributed lots of great ideas, contacted hundreds of manufacturers, and acted as a conduit to our database. That database—created and managed by programming ace Joe Humphreys—was seemingly filled to the brim by the astonishing Constance “No Errors” Wiggins. Eagle-eyed proofreader Lori Fry refined the data, and graphic designer Linda Gough transformed it into a work of art. *EM* Editor Steve O provided lots of advice and guidance, Associate Editor Gino Robair, Copy Chief Patty Hammond, and Assistant Editors Rick Weldon and Carolyn Engelmann performed their magic on the feature stories, and Production Manager Jane Lowe and Production Assistant Jeremy Nunes kept their eyes on the stopwatch to make sure that we delivered the goods on schedule.

I am confident that our efforts have provided you with a useful tool for realizing your musical goals, whatever they may be. Above all, I wish you endless hours of fun making music in your personal studio.

Barry Cleveland

*Barry Cleveland*  
Editor

## PERSONAL STUDIO BUYER'S GUIDE

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Associate Editor **Gino Robair**

Copy Chief **Patricia Hammond**

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Up the value of your mic locker without dropping another nickel into it.

Pit an amateur with \$10,000 worth of microphones against the pro with a \$1,000 mic and the better recording will emerge from the latter corner, pretty much every time. How? Quite simply, pros use their ears.

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Furthermore, a detailed, accurate monitoring system is what patches flesh and blood into the electrical system and provides a clear window to the sound at every step of the recording process. This is precisely why the best in the business agree that their monitors are the single most critical piece of hardware in the studio.

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To find out more, please visit our website @ NHTPro.com or call toll free 1-877-4NHTPro (464-8776).

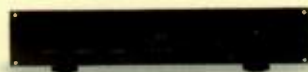
### *A-20 Monitors*



*NHTPro's reference monitoring system. The ultimate in high-end sonics for project, production and post studios.*

*The A-20 combines remarkable precision, detail and dynamics with real functionality and usability.*

### *A-20 Control Amplifier*



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#### **Monitors:**

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- 4MB RAM on board. Expandable to 36MB RAM

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- MIDI interface = In / Out thru Din

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Console 8/4



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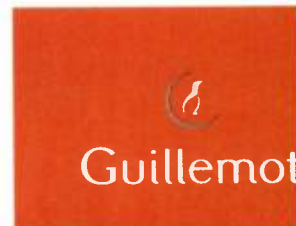
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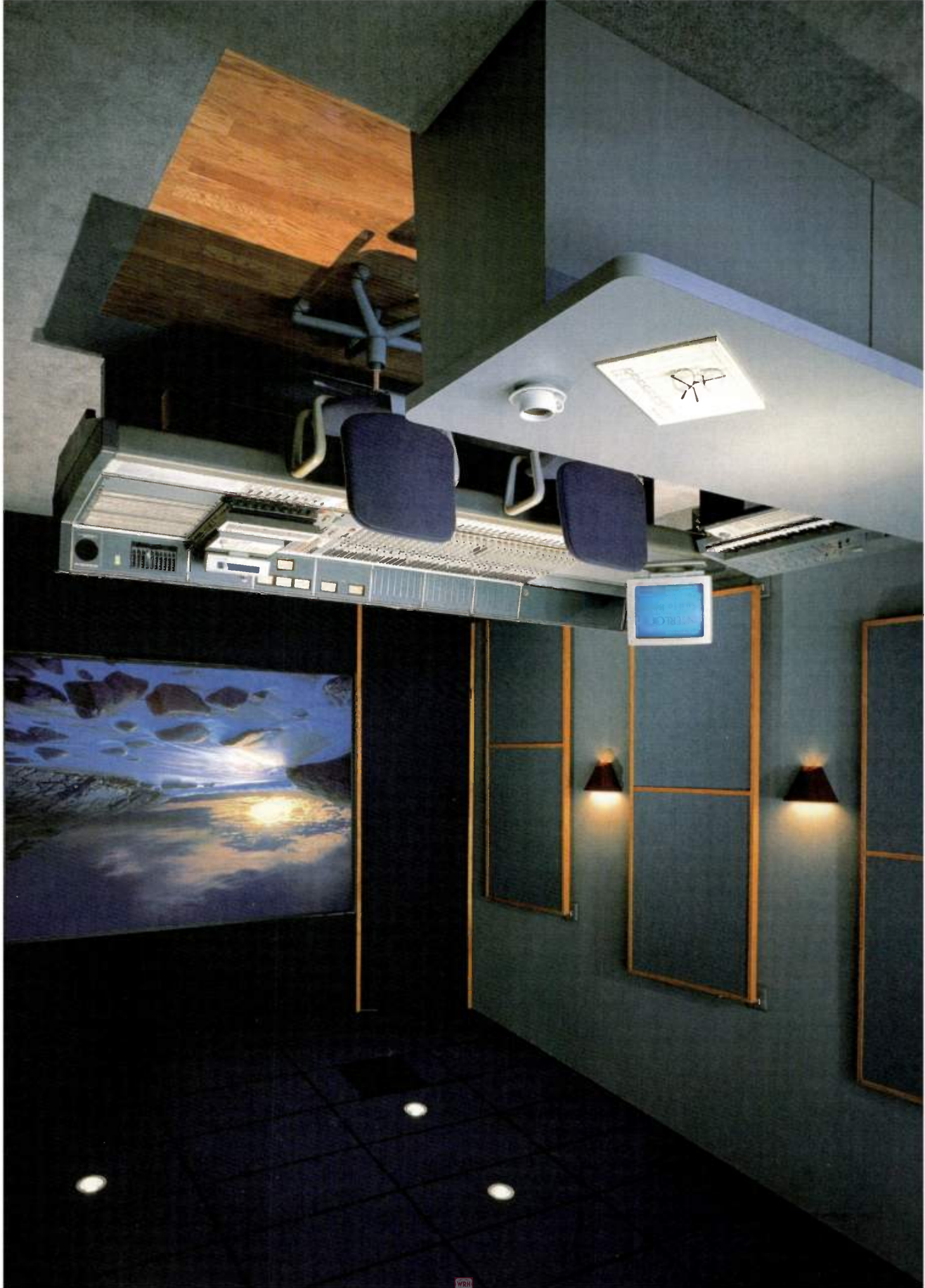
By Chris Pelonis and Geoffrey Goacher

# *The Personal Studio Makeover*

**Tune your  
control room  
like the pros do.**

Most personal-studio builders have neither the budget nor the room to transform their studio into a facility of professional caliber. You can't expect to get million-dollar sound for a few hundred—or even a few thousand—bucks. But there are techniques you can use to greatly improve the acoustics of your studio space, even if it's a rectangular room with parallel walls. These tips will help you get optimal performance from your personal studio, no matter how modest it is.

Because, for many people, the control room *is* the studio, we will focus on the acoustical treatment of this all-important space. Think of the control room as the interface between your ears and what gets recorded. With a tuned room, you'll get a true representation of the mix, which is the key to creating high-quality work.





## BASIC CONSIDERATIONS

Before we get into acoustics, you'll need to make sure that you don't have any weak links in your monitoring system. First of all, monitoring systems for critical listening must have a fairly flat frequency response from at least 60 Hz (or lower) to 16 kHz (or higher). The power amp should also have as flat a frequency response and as low a distortion spec as possible. Fortunately, most studio-grade near-field monitors and power amps on the market do a fine job of meeting these specifications. Therefore, selecting the "right" system is often just a matter of personal taste.

It is also important to set up the monitoring system symmetrically within the room. The distance between speakers should be the same as the distance from each speaker to your ears, thereby forming an equilateral triangle (see Fig. 1). For near-field monitoring, the distance between speakers should be about two to four feet, depending on their size and dispersion and what is ergonomically most feasible. Also, the center of this equilateral triangle should be equidistant from each of the room's walls.

However, even when high-quality gear is placed symmetrically in the room,



Christopher Cross's personal studio. Notice how sound absorbers are strategically placed on the walls and ceiling as well as in the corners.

your setup may well fall short of sonic accuracy. The overall sound may be boomy and muddy, the bass too loud or too soft, the high end dull or harsh, and the imaging blurry and undefined. Room acoustics can play a significant role in creating and reducing these problems.

In pro studios, room acoustics are considered a top priority. Typically, the owners spend a good deal of money on professional consultation, premium construction, and first-rate sonic treatments, sparing no expense to achieve a trouble-free, acoustically "neutral" monitoring environment. Luckily, acoustic problem solving is not outside the financial realm of the personal-studio owner. Expect to spend at least the same sum of money for acoustical treatment as you did for your monitors.

## SPEAKER PLACEMENT

Your first consideration should be the orientation of the speakers in the room. Assuming that your space is rectangular, it is best to have the speakers pointing down the longest dimension so that low frequencies have a chance to develop before hitting the back wall. Next, consider the position of your speakers in relation to the listener, and adjust them until you get the most accurate bass response. This is critical for every studio.

The way that low frequencies behave in a room is dictated largely by the room's dimensions. Certain frequencies, due to the lengths of their respective sound waves, get reinforced as they move among the room's boundaries—the walls, floor, and ceiling—creating resonant boosts in volume at those frequencies (see Fig. 2). These resonances are commonly referred to as *standing*

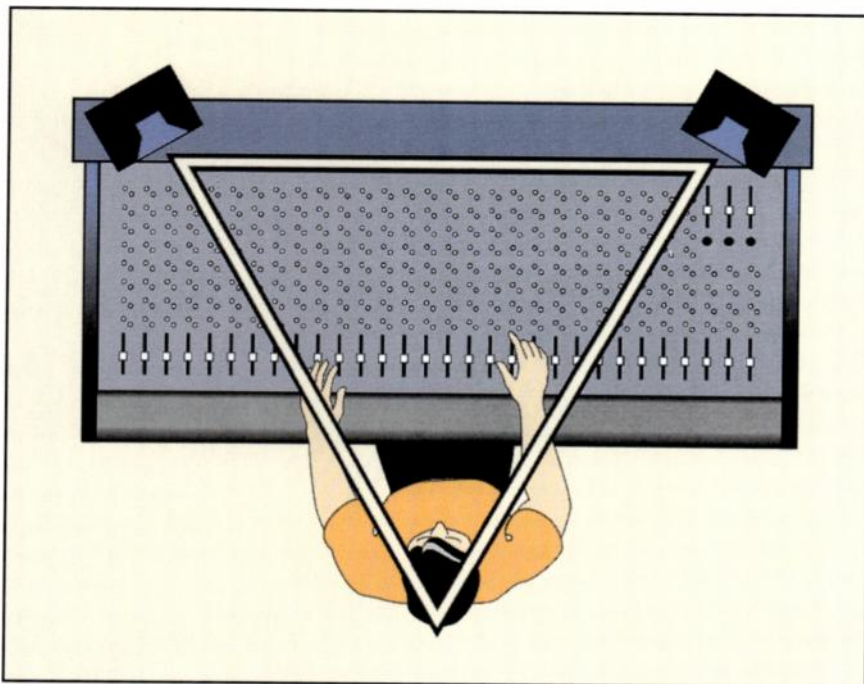
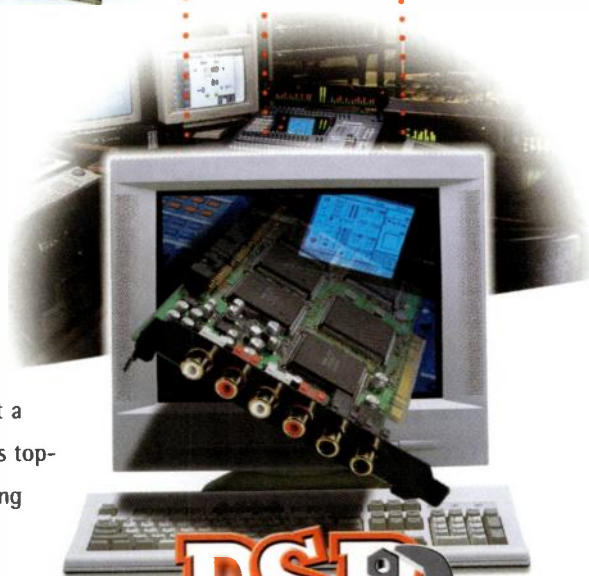
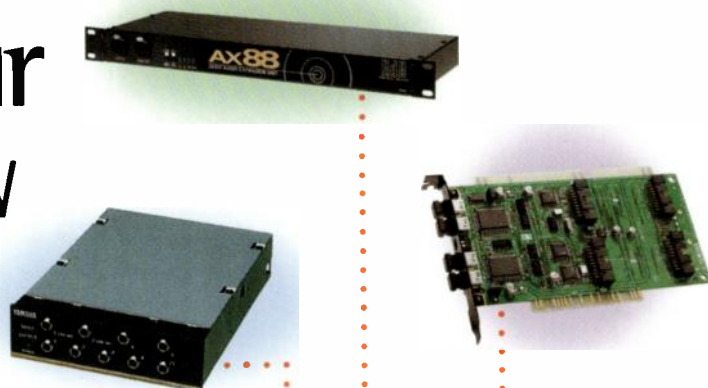


FIG. 1: The distance between speakers should be the same as the distance from each speaker to your ears, thus forming an equilateral triangle. The center of this equilateral triangle should be equidistant from each of the room's walls.

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waves. You can estimate the most prominent resonant frequencies of a room by using the equation

$$f_1 = 1,130/2L = 565/L.$$

In this formula,  $f_1$  represents the resonant frequency, and 1,130 is the speed of sound through air under "normal" conditions (which are defined as one atmosphere of pressure at sea level at 21 degrees Celsius).  $L$  represents the length of the room in feet. For example,

if the room is 10 feet long, there will be a natural resonant volume boost in the room at 56.5 Hz. In addition, natural boosts in volume will occur at multiples of this frequency:  $f_2 = 113$  Hz,  $f_3 = 169.5$  Hz,  $f_4 = 226$  Hz, and so on.

The resonances become more closely spaced together and their volumes diminish as you move up the frequency spectrum. In small rooms, therefore, resonances are typically less problematic above 200 Hz.

Low frequencies are omnidirectional

by nature. When you are using free-field rather than flush-mounted speakers, low frequencies reflect from all nearby room boundaries. The result is that the bass sounds as though it's coming from different directions (see Fig. 3). These slightly delayed reflections of the original signal cause comb-filtering peaks and dips within the range of frequencies above the modal resonance range (typically 200 Hz in a small room) to an upper limit of about 500 Hz. The increasingly directional nature of sound above 400 Hz makes speaker/boundary interference less of a problem for mid and high frequencies.

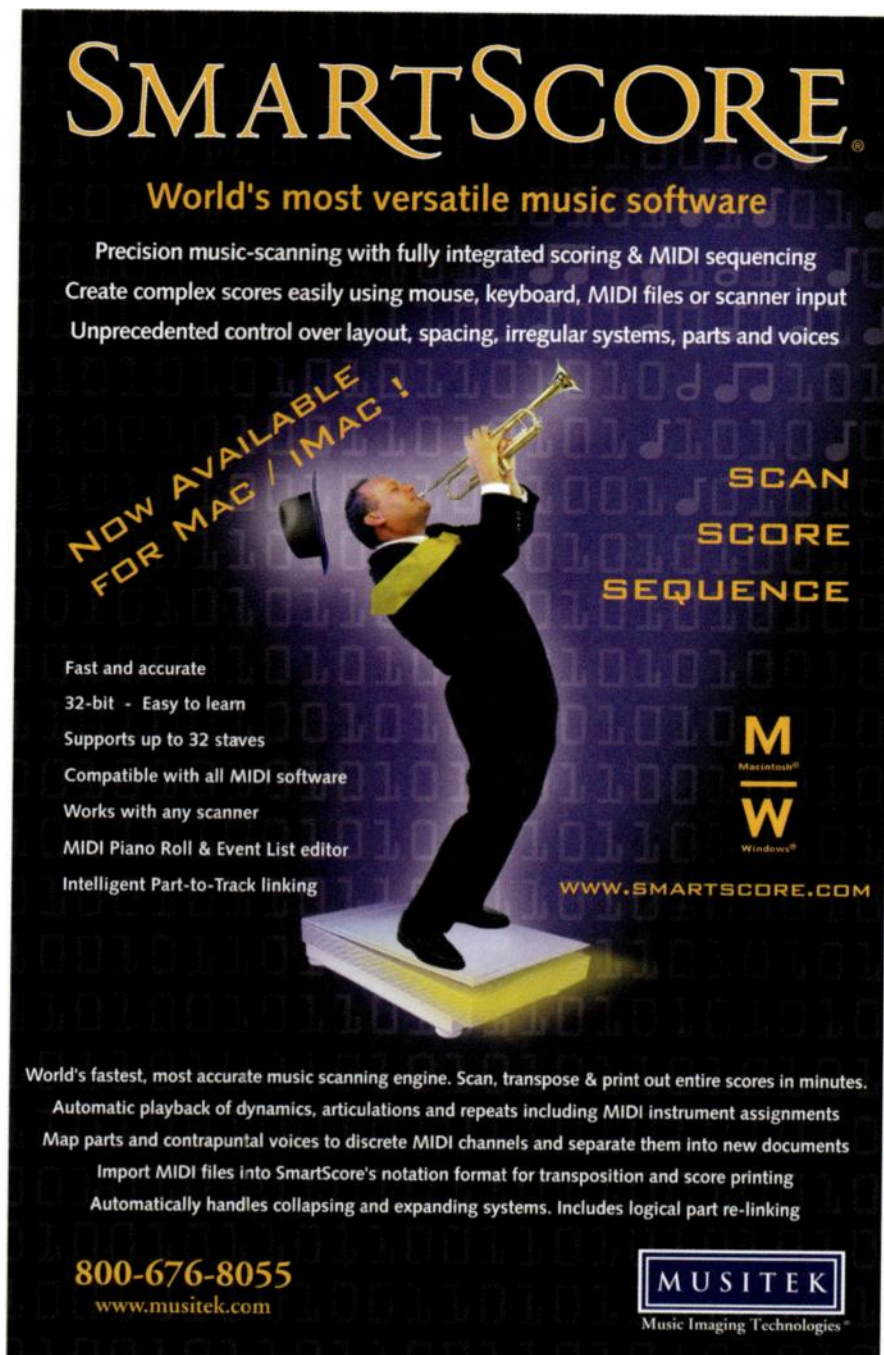
Speaker/boundary interference and standing waves can cause deviations in frequency response as high as 15 dB. This amount of variation could keep you guessing about proper levels for all the bass frequencies you mix. Our goal is to locate the speaker position that suffers the least from these types of interference.

#### SOFTWARE ROUTE

First we will find the best listening position and then acoustically treat the walls and ceiling based on this position. You can locate the sweet spot using specialized studio-design software that does predictive analysis; such programs include *Acoustic-X* (Pilchner Schoustal Architectural Acoustics), *Visual Ears* (KB Acoustics), and *Room Optimizer* (RPG Diffusor Systems). These programs ask you for the dimensions and characteristics of the room so that the software can mathematically determine which position in the room is the most accurate for listening.

To find the sweet spot in real time, you will need to have a real-time analyzer (RTA), a calibrated measurement microphone, and a pink-noise generator. If you have furniture and equipment in the room already, using an RTA will give you greater accuracy in positioning your listening station. You can also use the real-time approach for verification of the software analysis.

Set the microphone where you would prefer to be sitting. Then run pink noise through one speaker only, and move that speaker in 4 to 6-inch increments in every direction until you find the position where the bass response is flattest. Once you have located the best spot for the first speaker, measure its distance from the microphone, and mirror it with



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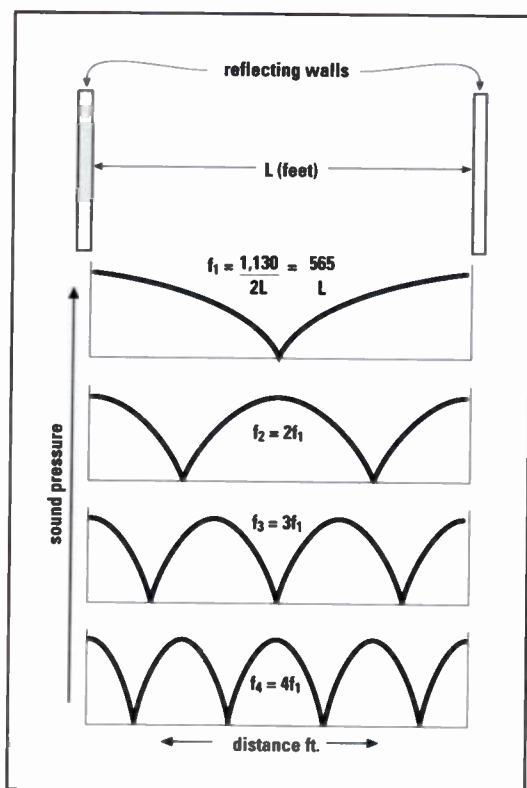
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**FIG. 2:** When wavelengths are twice as long as the distance between room boundaries, a “standing wave” reinforcement of the wavelengths occurs at that frequency and its harmonics, resulting in a boost in their volume.

the other speaker to form an equilateral triangle.

Another approach is to place one of the speakers where you want it and then search for the optimal seating position by moving the microphone. When you find the sweet spot, measure and place the other speaker to form your equilateral triangle.

If you’re using enclosed monitors with separate woofers and tweeters—known as *discrete* rather than *coaxial* or *concentric* monitors—position them so that the speakers are in a vertical line, one on top of the other. (Putting them on their sides, with the woofer and tweeter going in a horizontal direction, creates phase problems.) Be sure that the speakers are placed high enough to project over the console.

## RAYS VS WAVES

After you’ve established the speaker and listening positions, the next step is to treat the room to reduce unwanted reflections. You’ll need to address two areas of acoustics: *ray acoustics* and *wave acoustics*. Understanding how sound be-

haves in the rectangular confines of a personal studio, where dimensions are usually fixed and space is tight, is the key to the proper application of sonic treatment.

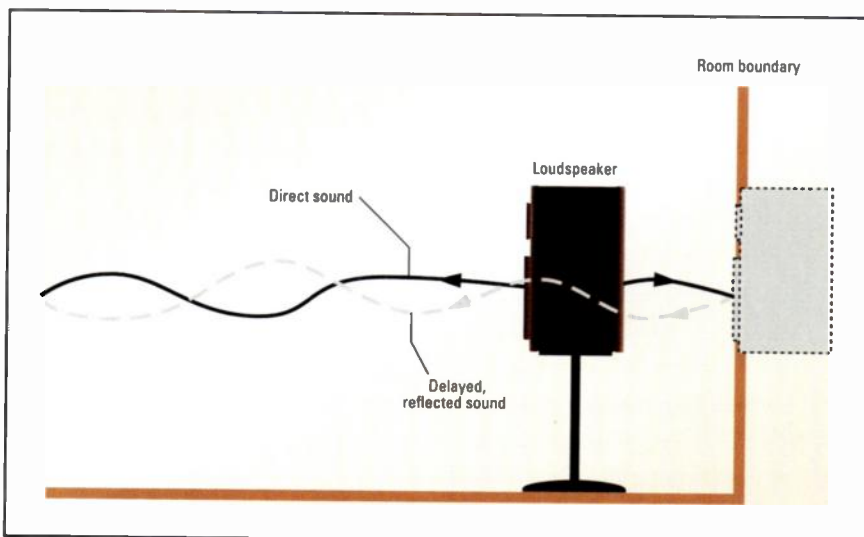
**Ray acoustics.** Ray acoustics apply to the mid and high frequencies. These frequencies have very short wavelengths that arrive at a boundary surface completely developed. These frequencies behave in much the same way as beams of light—for example, hard and irregular surfaces diffuse and scatter beams randomly, whereas more absorptive surfaces are less reflective (see Fig. 4).

The biggest detriment to mid- and high-frequency accuracy is the presence of *early reflections*. When you listen to your monitors, you hear the direct sound from the speakers followed by reflections of that sound from the walls, ceiling, and other hard surfaces of the room. When reflections arrive at your ears—within 20 milliseconds of the direct sound—you hear them as part of the direct sound. Because sound waves travel at approximately one foot per millisecond, most of the first reflections that make their way to the listening position in a small room qualify as early reflections.

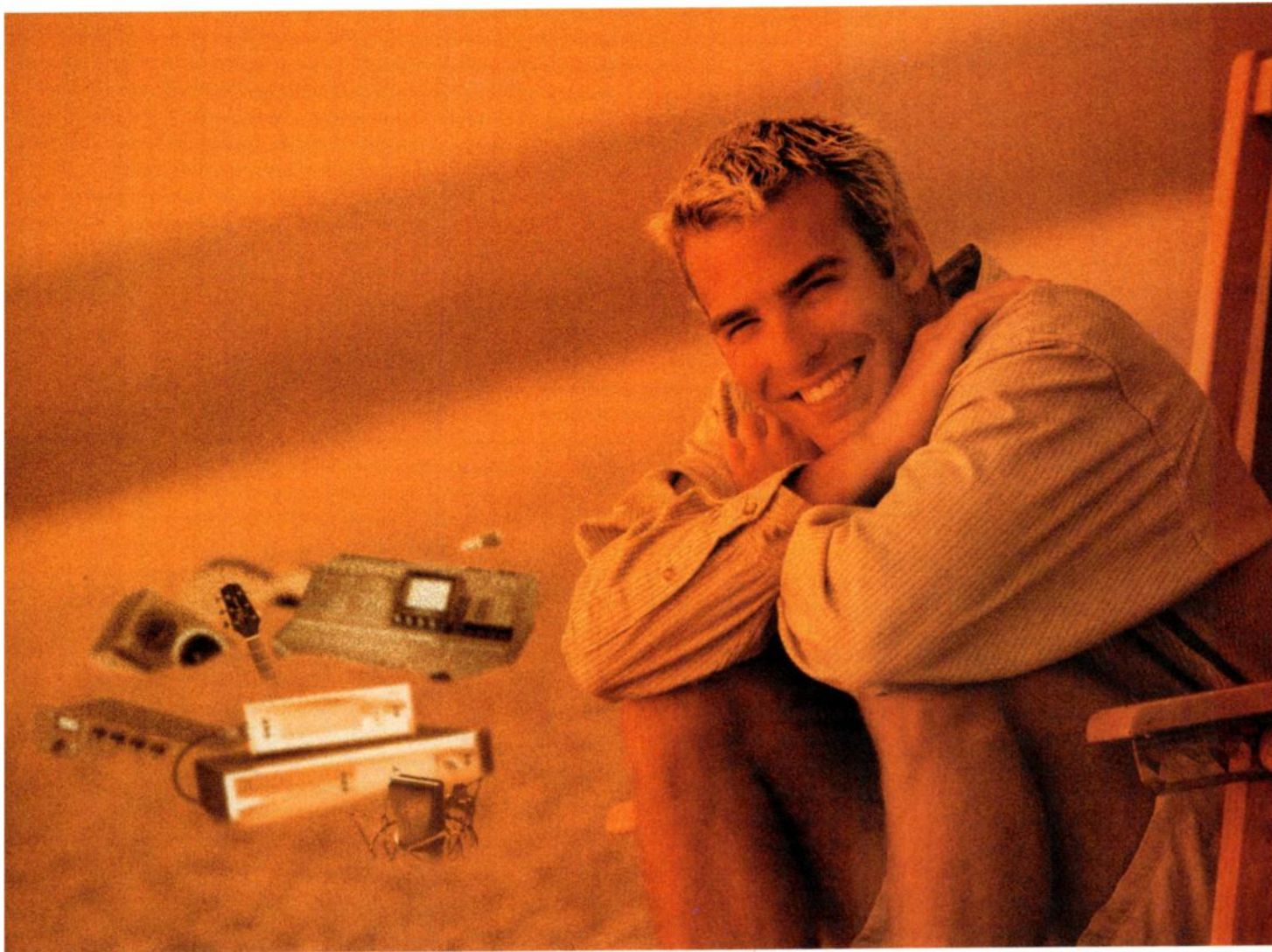
Commonly, the frequency range of early reflections extends from 500 Hz on up. This range critically affects the accuracy of the monitoring system’s imaging as well as its mid- and high-frequency tonality. Early reflections often add audible comb-filter distortion to the direct signal, tainting the frequency response with a variety of boosts and dips. Early reflections also tend to blur the stereo imaging between the speakers, making it difficult to hear the exact position of sounds within the stereo field.

If you have the luxury of constructing a studio from the ground up, you can minimize early reflections by avoiding parallel surfaces. When modifying an existing room, though, you’ll have to apply acoustical treatment to the walls and ceiling. Additionally, you’ll need to know the dispersion characteristics of your monitors when determining which areas to treat; fortunately, these specs are provided by most monitor manufacturers.

**Wave acoustics.** Wave acoustics deal with the behavior of low frequencies—from 20 to 500 Hz. If the room’s acoustics are balanced, the bass and low-mids will be full and warm. If the room has significant frequency boosts in this range, the resulting sound will be boomy, muddy, or both. Dips in low frequencies will result in a thin and hollow sound. The goal is to flatten out the room’s low-frequency response so that you don’t erroneously mix your music to compensate for boosts or dips caused by the acoustic environment.



**FIG. 3:** The omnidirectional nature of low frequencies causes them to reflect from all nearby room boundaries.



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## PLACING ABSORPTION

For now, let's assume that your speakers have a 90-degree dispersion in the mid to high frequencies. From the front of the monitor, position a laser pointer or a small flashlight to point 45 degrees to the right wall, then 45 degrees to the left wall, and then 45 degrees to the ceiling. These are prime areas where absorption will eliminate annoying early reflections from the listening area.

In large commercial studios, if the first splay of the side wall is 135 de-

grees from the face of a speaker, the dispersion of the mid and high frequencies will run parallel to that wall. When designing a room from the ground up, you would want to apply absorption to this area to clean up any mid- to high-frequency reflections that are more than 90 degrees from the speaker face, as well as any reflections that may occur from other parts of the room. In a personal studio with parallel walls, this treatment is absolutely mandatory.

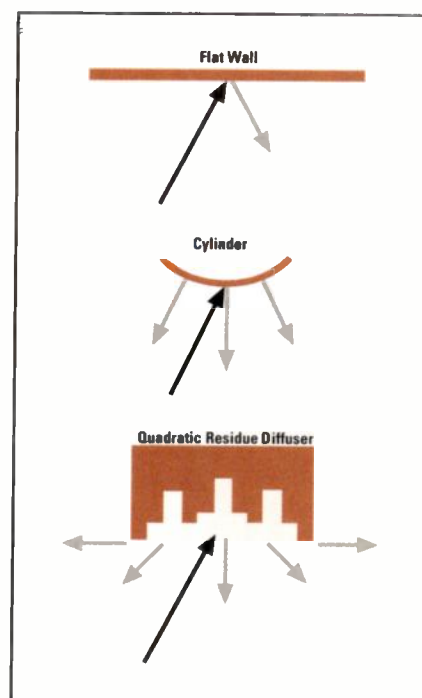


FIG. 4: Diffusers and cylinders scatter reflections in many directions.

The most common way of dealing with these reflections is by covering one or two inches of fiberglass (typically one with a density of three to six pounds per cubic foot) with panel fabric (a fire-rated material that is acoustically transparent). If you are on a tight budget, you can substitute duct liner or sound-deadening board. If you have the space to spare, you can create hinged panels that allow you to easily change the way you offset the parallel surfaces.

## LOW DOWN

To absorb low frequencies in a commercial studio, the room's dimensions are used to focus the frequencies into an area where a bass trap has been built. However, a bass trap takes up quite a bit of space and therefore may not be practical in a personal studio. Instead, you can apply a combination of broadband bass absorption and full-band absorption/diffusion in the back of the room. But keep in mind that the modal response of a room can change as you bring in more equipment and people, thereby reducing the effectiveness of tuned absorbers.

One of the places that low frequencies accumulate is in the corners of the room. An affordable method of controlling the corners is to line them with loose insulation. Place a panel of 4-inch



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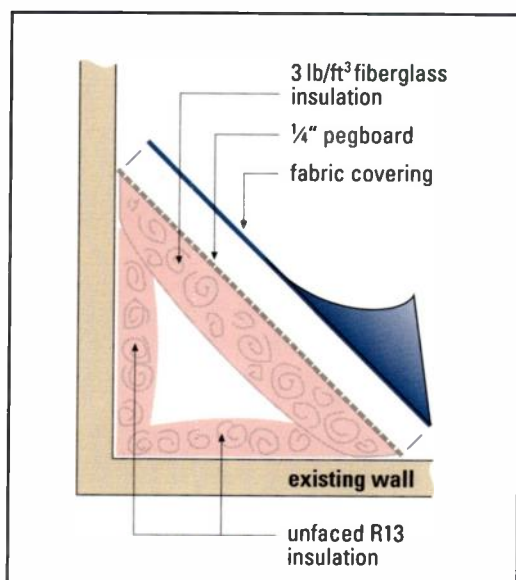
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**FIG. 5:** Bass traps for the rear corners of the studio should include a layer of pegboard covered with panel fabric. Unfaced insulation lines the wall inside the trap.

fiberglass (with a density of three pounds per cubic foot) covered in panel fabric across each corner. In the rear corners behind the listener, the fiberglass panels should have a pegboard surface behind the cloth (see Fig. 5). The

effect will be less absorption in the mid and high frequencies and a bit more ambience in the rear of the room. The corner traps in the front of the room do not need the pegboard (see Fig. 6). Another option for the rear wall is to build a pegboard or thin plywood V shape and then line it with fiberglass. This offsets the parallel surfaces and increases bass absorption.

For an accurate listening environment, eliminating the standing waves between the floor and ceiling is essential, especially around the console and speaker areas. If you have a standard 8-foot ceiling, there are few affordable options for treatment. The preferred method is to attach panels of 4-inch cloth-covered fiberglass (again, with a density of three pounds per cubic foot) on the ceiling.

In the rear 30 to 50 percent of the room, install RPG's Binary Amplitude Diffusor (BAD) panels over the fiberglass ceiling treatment. (RPG calls the panels *diffusors* because they combine the characteristics of reflection, ab-

sorption, and diffusion into one product.) Keep the ceiling panels at least two feet away from the walls to avoid a dead room.

The final area requiring treatment is the front wall. Equipment racks and the back side of the console typically end up sending reflections toward the front wall. A panel similar to those used on the side walls will help. You can also use flannel-backed velvet curtains that weigh at least 14 ounces per square yard. By hanging the curtains over a couple of inches of fiberglass treatment, you extend the low-frequency absorption and further eliminate front-to-back standing waves.

## EQUIPMENT

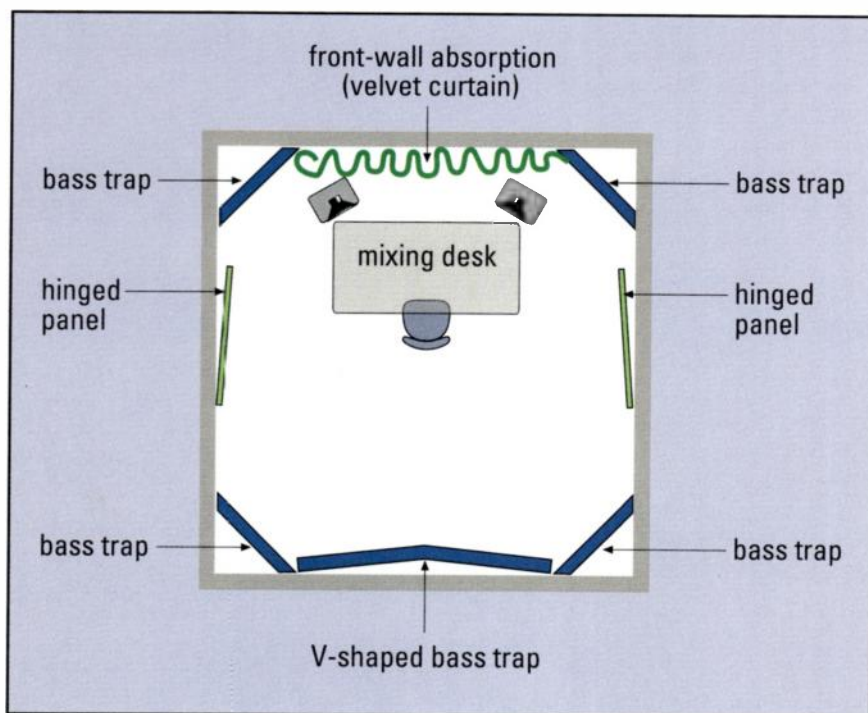
Once you've positioned your speakers and acoustically treated the walls and ceiling, you're ready to install your equipment. Keep its layout as symmetrical as possible, and keep your racks and other furniture to a fairly low profile. A height of 30 inches is ideal; nothing should be taller than 36 inches. If possible, mount your monitors on stands behind the console, rather than placing them on the console by the meter bridge, as this will diminish the reflections from the console's surface. Avoid cavernous spaces entirely—any large, empty racks or similar items should be filled with something, even if it's only blank panels.

Arrange your equipment as ergonomically as possible. Position your gear so that it's within easy reach, but be careful not to close yourself in. Finally, to keep things tidy, you may want to run the wiring down one side of the room while keeping the other side clear for traffic.

## MISSION ACCOMPLISHED

If you're creating your studio on a limited budget, you need to be realistic about what you can accomplish. With a little know-how and some creative exploration, however, you can turn any room into a reasonably accurate listening environment. ■

*Chris Pelonis is a studio designer and acoustician, and founder and president of Pelonis Sound and Acoustics. Geoffrey Goacher is the founder of Acoustical Research Associates, which specializes in research and communications on audio and acoustics for critical listening environments.*



**FIG. 6:** You can significantly improve room acoustics and monitoring accuracy by using corner bass traps, strategically placed absorbers, and back-wall diffusers. Notice how the hinged panels can handle sound emitted from speakers that have a 90-degree dispersion.

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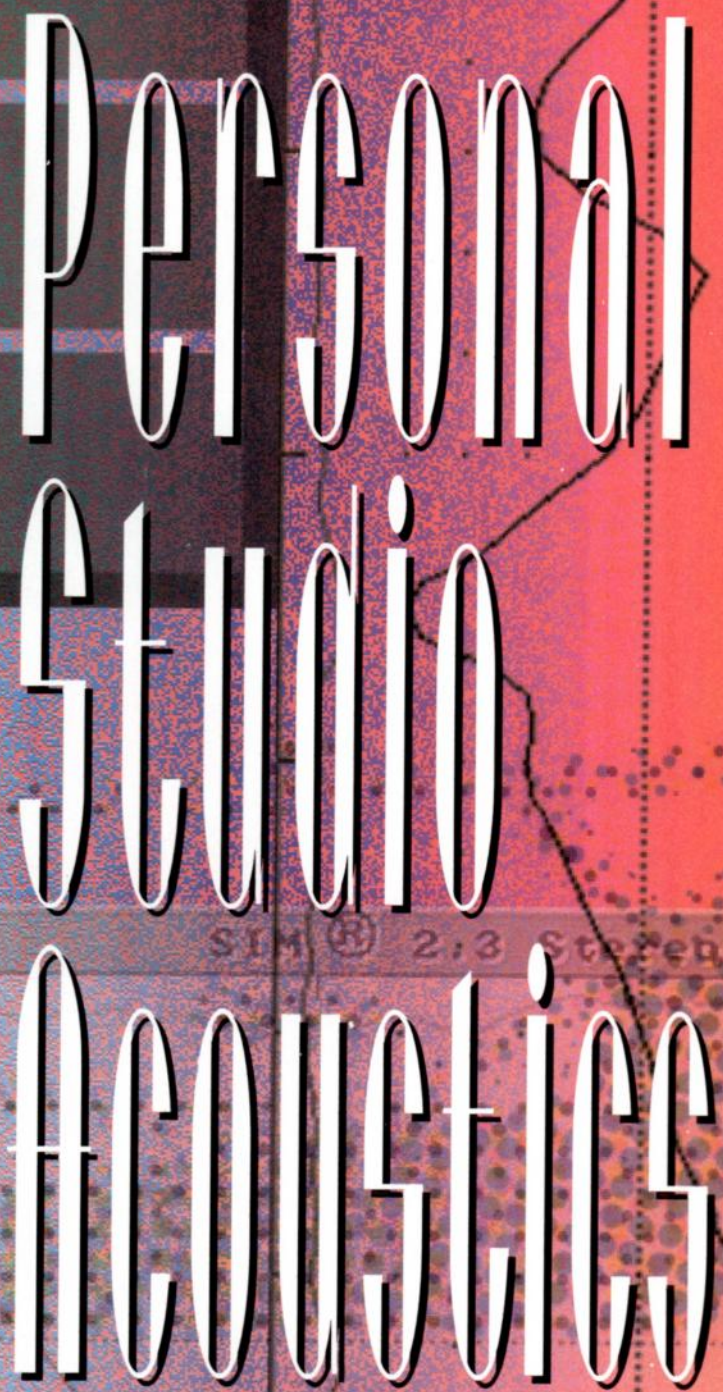


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# Personal Studio Acoustics

By Bob Hodas

**W**hen I was asked to write an article on acoustic fixes for small home studios, I said, "No problem, I've analyzed plenty of small rooms." Then I was asked to write it from the perspective of someone who couldn't afford a professional room analyzer, and I said, "Oh s\_\_t."

Although there are very few rules of thumb, I'm going to try to give you some guidance in solving some of your acoustic problems on your own. This process requires some intensive listening at times, but, hey, there's no time like the present to hone those skills. Make your ears your analyzer. Also, because this article is aimed at the "do it yourself," the acoustic solutions I will present are the cheapest I can think of, and therefore, some assembly is required.

*(This article was originally published in the February 1999 issue of Mix magazine and is reprinted here with the permission of the publisher.)*



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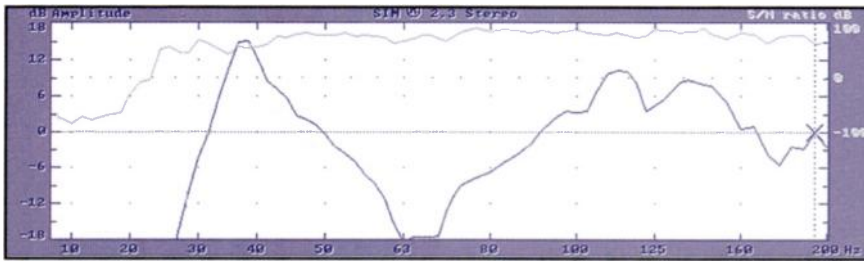


FIG. 1: Shown here is the bass response of a speaker placed along the short wall of a 9 × 15-foot room.

## SPEAKER SETUP

It is very important that you become completely familiar with the speakers you are going to use. Take a good look at the manufacturer's frequency response charts, but remember that these are anechoic measurements. As soon as you put your speakers in a room with boundaries (walls), the bass response will start to change significantly. Bass response will build up even more when you place a speaker against a wall (half-space loading) or in a corner (quarter-space loading). But the response charts are useful for knowing what the limitations are. For example, a Yamaha NS-10 monitor will roll off dramatically below 125 Hz, so you don't have to be too concerned about deep bass problems when positioning this speaker. You also want to pay close attention to the recommended position for proper phase alignment. You want to make sure that this alignment point intersects your ear level. For some speakers it's directly aligned with the tweeter. For others it's a point between the woofer and tweeter. This is dependent on the design of the monitor, so check the manufacturer's literature.

Before even thinking about acoustic treatments, you need to optimize the speaker positions in your room. The first step is to determine which wall your speakers should be on. If your room is square, it doesn't matter. If your room is rectangular, it all depends on the dimensions. To figure out which wall to use, place one speaker on each wall and at listening height in approximate position. Run a mono send from your CD player to one speaker at a time and do some serious listening to the bass. You should be able to get a feel for which speaker has a flatter bass response. More bass is not necessarily better. Listen for a smooth and connected bass response from the mids on down. Figures 1 and 2 are examples

of just how different the frequency response can be when the monitors are placed along different walls in a room measuring 9 × 15 feet.

For Dustin Hoffman, the word was "plastics." Well, I have just one word for you: symmetry. If you do just one thing right, it should be to set your room up as symmetrically as possible.

*The bass response  
can vary radically  
depending on  
whether the door  
is open or closed.*

What does this mean, exactly? Your speakers must be placed symmetrically in the room, or they will have different frequency responses. This means that your music will sound different in the left and right speakers, your "center" image will be off-center, and your product will not properly collapse to mono. And don't believe the rumor that near-field monitors aren't affected by room

acoustics; that goes against the laws of physics. So break out the old tape measure, and make sure that the left and right speakers are equidistant from both the side walls and the front wall.

Why is this necessary? It's due to the fact that, below 200 Hz, your speakers are fairly omnidirectional. The signals that bounce off the front and side walls are going to mix in with the direct output of the speaker. This delayed signal will cause comb filtering. The time delay, and thus the frequency, of interaction is dependent on the distance of the speakers from the walls. If the left and right speakers are at different distances from the walls, the cancellations will occur at different frequencies. This is also true for first-order reflections above 400 Hz, which I will address later. Figures 3 and 4 illustrate what happens to the bass when speakers are placed asymmetrically in a room.

Now you need to determine how far out from the front wall the speakers should go. This will require more listening tests. Listen to both speakers in stereo. You should move the speakers six inches at a time forward or back. In a small room, these increments can make a big difference. Once again, you are trying to find the smoothest response. I realize that there may not be much space, but do the best you can. Believe it or not, sometimes the best place for a speaker is right up against the front wall.

At this point, I'd like to offer a word or two on the evils of console reflections. Figures 5 and 6 show why your speakers are better off several inches behind the meter bridge. Now, I realize that you can't do this if you have one of those all-in-one-workstation pieces of furniture, but you should be aware of these tight reflections bouncing into your face. If you have the freedom, move the speakers back. I have a 2 × 2-foot plastic mirror that I like to lay

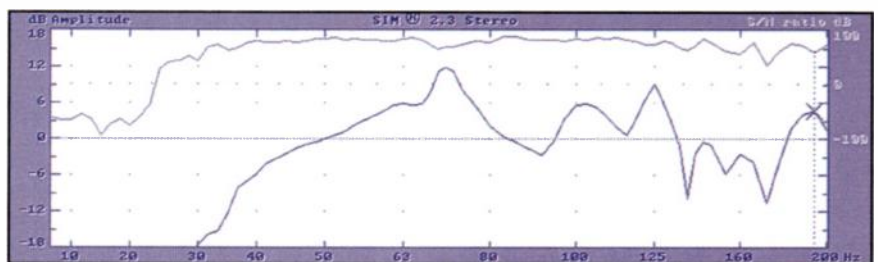


FIG. 2: This is the response of a speaker placed along the long wall of the same room. Note the more contiguous bass response.

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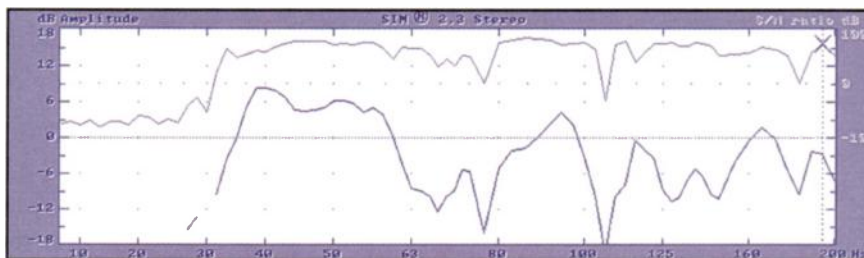
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**FIG. 3:** Here is the frequency response with the left speaker asymmetrically placed in room.

on top of the console surface. If I sit at the console and can see the tweeters in the mirror, I know I'll need to move those speakers back until there's no reflection.

In order to get good stereo imaging, you should sit so that the positions of your head and your monitors form an

on your room size and the width of your console.

Remember also that the typical small monitor is designed to be used at a distance no greater than six feet. As you adjust the speakers, keep in mind that each speaker needs to be the same distance from the side walls. Now aim the speakers at the mic stand, maintaining the proper phase alignment for the given monitors.

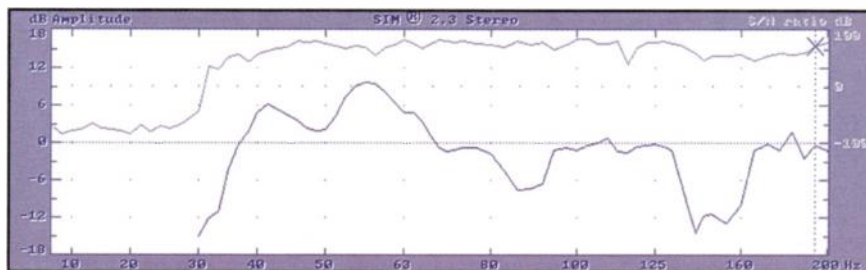
Doors are an important factor in your room. The bass response can vary radically depending on whether the door is open or closed. More often than not, doors are in corners and have a greater effect on one speaker than the other. You want to avoid that, so I recommend keeping doors closed, but you should still do some listening to figure this out.

*Believe it or not,  
sometimes the best  
place for a speaker  
is right up against  
the front wall.*

equilateral triangle. To optimize your listening position (also known as the "sweet spot"), measure the width of your room and place a mic stand in the center, two to three feet back from the console arm rest. You want a nice wide sweet spot, so the width of your console or workspace will determine exactly how far back you sit. The measured distance from tweeter to tweeter should equal the distance from each tweeter to the mic stand—the distance will depend

#### ACOUSTIC ISSUES

Now that you have your speakers in place, you'll need to address the first-order reflections. These are the reflections that arrive at the mix position within the first 19 ms of the direct signal. (These signals will have traveled about 21.5 feet more than the distance between the monitor and the sweet spot.) Your brain cannot differentiate between a direct and a reflected signal in this short space. The result is that the reflection is convolved into the direct signal, just like a delay line. Of course, this causes comb filtering and, therefore, cancellations in the frequency



**FIG. 4:** This example shows the response with the right speaker asymmetrically placed in room. Note the significant difference compared with Figure 3.

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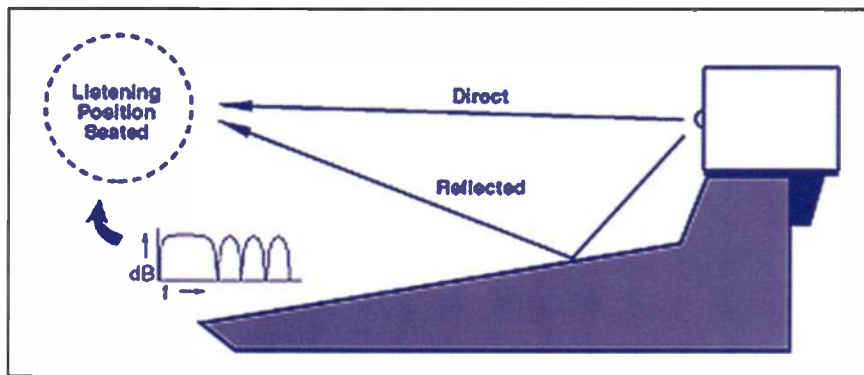
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**FIG. 5: Reflections interact with the direct signal (causing comb filtering) when speakers are placed on the console top.**

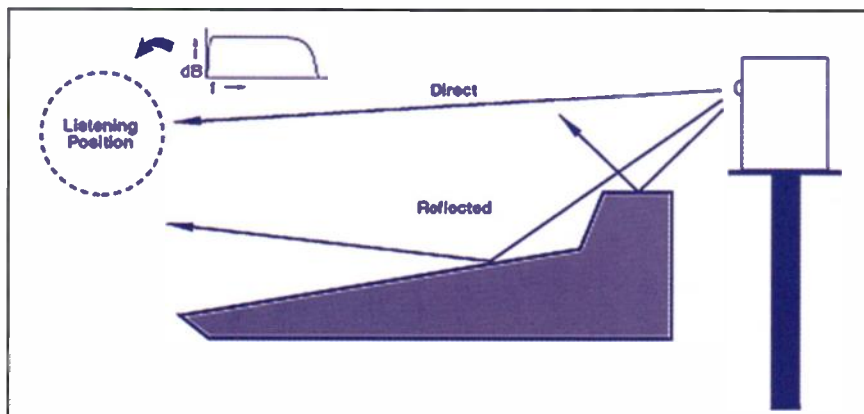
response. That results in both imaging problems and phase problems. Bad boogie.

Identifying these reflections is easy, however. Above 400 Hz, sound acts a lot like light (time to use that plastic mirror again). Have a buddy sit at the mix position, and place the mirror flat against the left wall. Move the mirror around until your buddy sees first the left and then the right speaker reflected in the mirror. Cover the entire mix area this way, doing the same for the right wall, the ceiling, and the back wall, and mark each area where your buddy sees a speaker reflected so you can treat it. If you set your room up properly, the treatments for the left and right walls should be fairly symmetrical.

Now measure the distance of the direct path from the speaker to the sweet spot. Next, measure from the speaker to each marked area and back to the mix position (reflected path). Subtract the direct path from the reflected path. If it is less than 22 feet, you should apply treatments.

There are two choices for treating these reflections: absorption and diffusion. For the side walls and ceiling, I like to use absorption. Here's why: an absorber removes the energy, but a diffuser spreads out the energy in space and time. This means that the diffuser creates many smaller reflections of lesser energy. If I do an impulse response of a side-wall reflection, diffusers and absorbers both appear to eliminate the reflection. But if I take a reading of coherence, the absorber gives a better reading because the offending reflection has been removed. The diffuser's coherence reading, on the other hand, is not so good, because the reflection energy still reaches the mix position (though it has been reduced and spread out in time).

For the side walls and ceiling, an inexpensive solution is 6-pound-density, 2-inch-thick compressed Fiberglas, sometimes called spinglass. (It comes in 2 x 4-foot sheets and is available in many large building-supply stores.) Cut the panel to fit the marks you made



**FIG. 6: You can redirect the reflections and smooth out the frequency response by moving the speakers back behind the console.**

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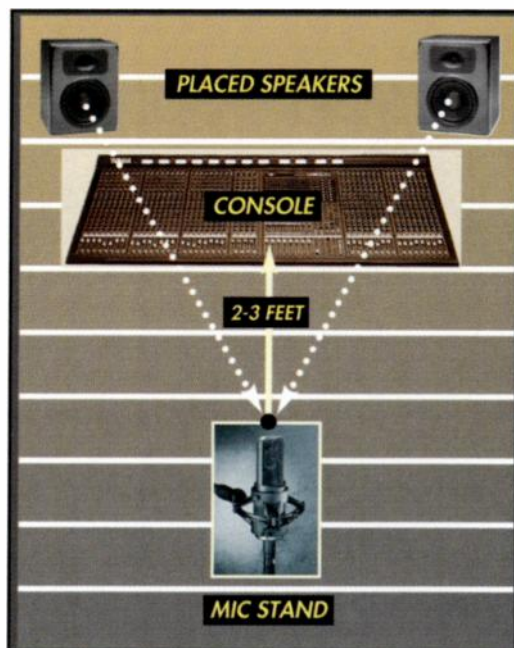
earlier. I often make the treatments a little larger than the area of reflection. The Fiberglas should be covered with a fabric that is acoustically transparent. Go to your fabric store and pick out something with a very open weave. You should see some light pass through, and if you hold it over your mouth, you should easily be able to blow through it. For neat-looking panels, build a 1 x 2-inch wood frame around the panel and stretch the fabric over it. Don't cover entire walls with these types of panels, however; they will disproportionately damp the high-frequency reverb time. Just treat the areas that are problematic—take a surgical attitude. There is nothing worse than the chesty sound of an over-absorbed room.

I prefer diffusion over absorption for the back wall unless it is closer than five feet from your head. I find that diffusion at the back gives a small room more openness, and the back-wall energy does not mess up the coherence much. The cheapest diffusor I know of is to take a piece of 1/4-inch peg board and bend it to form a curve. The

greater the curve, the more diffusion you get. Hold the curve shape in place with some 1 x 2-inch strips of wood. Another cheap method is to use PVC or ABS pipes of varying diameters, cut in half lengthwise. Mount these vertically so that the different diameters will give you some variance.

If your speakers are very close to the front wall, try mounting some pipe diffusors on the wall in between your speakers. This can sometimes give you more front-to-back imaging (depth) as it breaks up that solid reflection. Remember that most small monitors are meant to be used in free space.

Once you have treated the walls and ceilings, put on some music that you know well. Listen while standing in the corners to hear how much the bass increases. If you get a large buildup, you'll want to install bass traps in the corners. Make



**FIG. 7:** To optimize your listening position, measure the width of your room and place a microphone stand in the center, two to three feet back from the console arm rest, so that the positions of the mic and speakers form an equilateral triangle.

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the same kind of absorptive panel as explained above, using full 2 x 4-foot sheets of fiberglass. Place it vertically across the corner with the top near the ceiling. Seal the bottom off with some window screen and fill the corner cavity with loose R-19 insulation. (Don't pack it tight.) This is a general-purpose, broadband type of trap and hopefully it will help smooth out bass response, although properly controlling the bass is difficult without measurements.

If, after these treatments are applied, you feel that your room is still too live, some additional treatment may be needed. Try a 1-inch layer of bonded polyester. This will help to deaden the walls a bit, without the heavy-handedness of Fiberglas.

These tips should help you improve your listening environment. Most of all, the critical listening you do during this process will improve your engineering skills and give you a good understanding of your room's personality. Now go and make good music! ■

**Bob Hodas's new video, Room Tuning** with Bob Hodas, is distributed by Hal Leonard publications. Further audio enlightenment can be found on his Web site at [www.bobhodas.com](http://www.bobhodas.com).

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# Designing the Personal Studio

By JJ Jenkins and George Petersen

This story began a decade ago when we started assembling a private-use facility to handle a variety of production needs, ranging from acoustic recording to radio production, jingle work, and a steady stream of film/video scoring dates. Over the years, a seemingly endless parade of equipment has gone into—and come out of—this quirky little L-shaped room. Five years ago, we decided to do something about the control-room layout, which was appropriate for rock recording but ergonomically unsuitable for the needs of the modern project studio.

*(This article was originally published in the August 1992 issue of Mix magazine and is reprinted here with the permission of the publisher.)*





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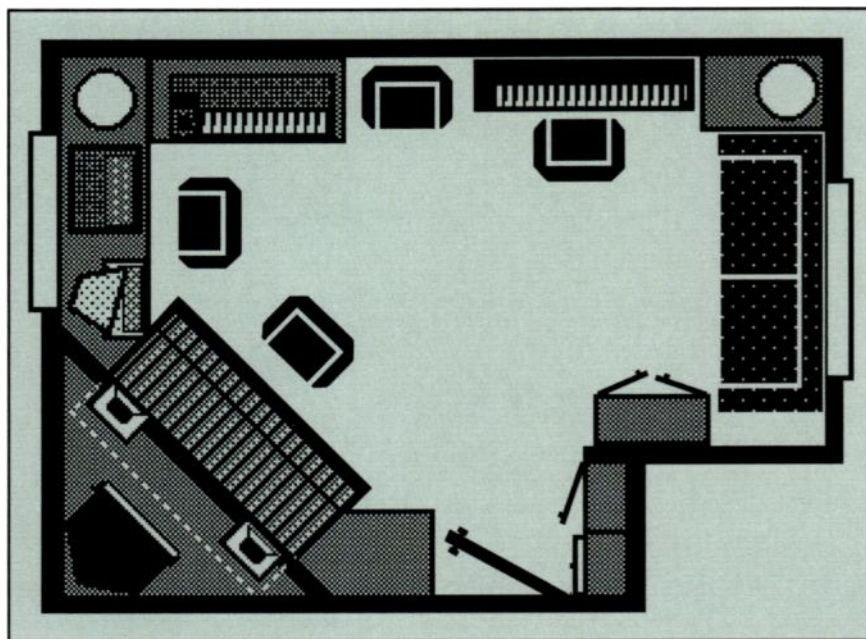
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**FIGURE 1:** Studio floor plan: corner-facing console extends below triangular shelf with video and audio monitors.

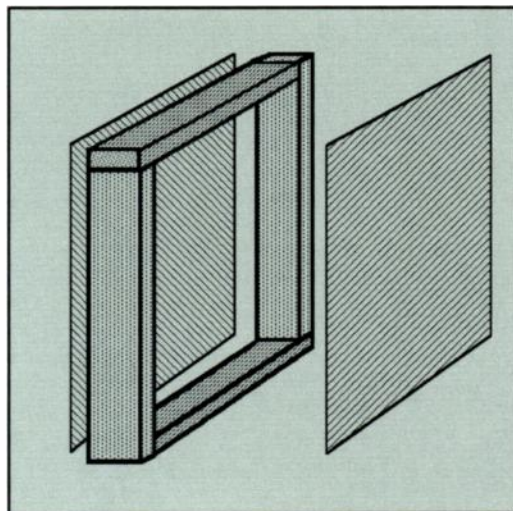
The design outlined in this article includes no acoustical changes to the room itself. It is well known that when you listen to monitors that are placed in the near field (within five feet of the listener), the acoustic effects of the room are substantially reduced, although not entirely eliminated. If acoustical treatment is required, a number of products, such as Acoustic Science Corporation's Tube Traps ([www.tubetrap.com](http://www.tubetrap.com)), may prove sufficient to touch up any minor anomalies. Also, because the monitors are placed over the console at 45-degree angles (relative to the rest of the room), there is less chance that any hard echoes will be caused by slap from the back wall.

After some soul-searching and several hundred sketches on rum-stained cocktail napkins, we came up with the floor plan shown in **Figure 1**. But before any gloom and doom-sayers in our audience out there start hurling stones about this room design, keep the following facts in mind:

First, this control-room layout works very well for the types of projects we produce. It may or may not be suited to your situation, although we know of at least five rooms that have adopted our ap-

proach, all with excellent results. And in addition to project studios, this design could be used for mastering suites, digital-editing/premastering rooms, and video-editing bays.

Second, like most project studios, the room was constructed within the confines of an existing space. In our case, the control room is an 11 x 16-foot, L-shaped space above the recording room, so we needed to make the most of the space we had. Cost was a deciding factor for us, and so we assembled all the counters and cabinets from commonly available, low-cost materials such as ¼-inch CDX plywood;



**FIGURE 2:** Column construction.



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2 × 4s and 2 × 6s; and a roll of charcoal gray indoor/outdoor carpet that was high-tech in appearance. The total bill for materials, including new floor carpeting to complement the carpet-covered countertops, was about \$450.

The key to this design is the unique positioning of the console, which faces directly into a corner. From this point, counters extend to the right and left of the engineer, providing immediate access to computers and monitors, outboard gear, autolocators, synchronization devices, and MIDI toys.

Rather than build equipment racks for signal processing and MIDI modules, however, we opted for some manufactured units: slant-faced, 9-space racks from Omnirax ([www.omnirax.com](http://www.omnirax.com)) that fit neatly under the 29-inch-high counter tops. Mounted on casters, these can be pulled out easily for reconfiguring, and their height makes them just right for playing MIDI keyboards or entering computer data. The counter tops behind and to the right of the console are supported by columns placed

46 inches apart, so two racks can sit comfortably side by side under each counter.


A large triangular shelf that is four feet deep and 90 inches wide supports a

Like most  
project studios,  
the room was  
constructed  
within the  
confines of an  
existing space.

20-inch broadcast video monitor and accommodates most near-field studio speakers. The lip of the shelf extends just over the console's meter bridge

creating a built-in look, while its 38-inch height offers ear-level placement of the monitors. The dotted lines on the shelf in Figure 1 indicate how far the console protrudes—its corners nearly touching the walls on both sides. The width of the monitor shelf can accommodate several pieces of outboard gear between the speakers, which is handy for those sessions when extra gear is brought in, or as a convenient location for tweaking presets or programming without having to move outside the sweet spot of the listening area.

This design requires placing studio monitors into a corner space, so be aware that the intersecting walls can play havoc with bass response, particularly with rear-ported monitors. The acoustical effect of such speakers in this application varies widely, depending on the size and placement of the ports, the free-air resonance of the woofers, and the speaker-to-corner distance. This can result in acoustical coupling or phase cancellation, yielding summation or attenuation of low-frequency energy



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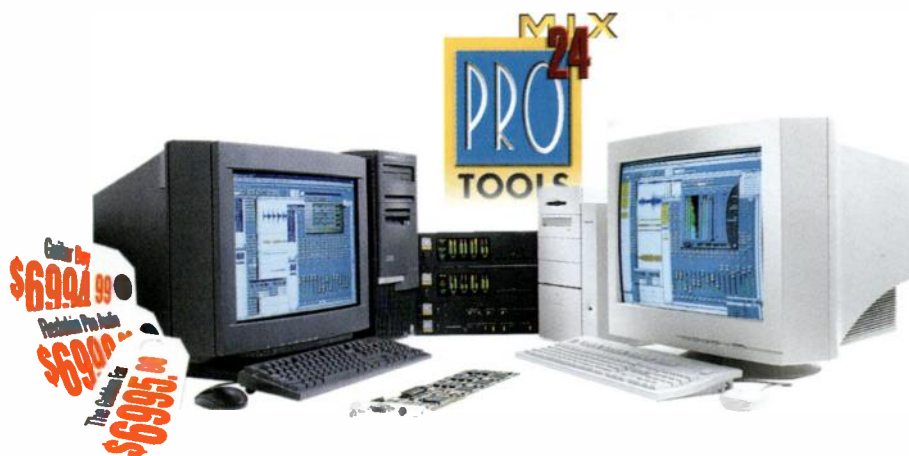
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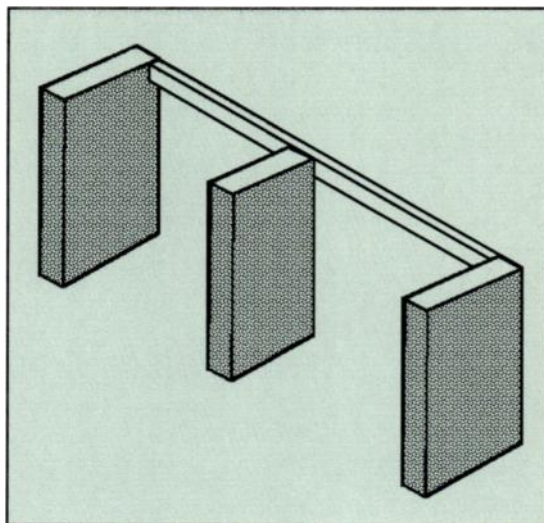


FIGURE 3: Column placement.

in the studio, with an outcome that is difficult to predict. Rear-ported monitors *can* be used on the corner shelf; however, front-ported or sealed-cabinet monitors are more predictable when used near corner walls.

The counter area to the right of the console is intentionally kept vacant, to be used as another location for storing temporary gear, placing in a second computer, and so on. Just below the monitor shelf, to the left of the console, we installed a “guest” patch bay. It is a one-foot sheet of Masonite that has a variety of  $\frac{1}{4}$ -inch and XLR jacks connected to the console’s large TT patch bay, with access to sends, returns, tielines, mic inputs, and even a couple of MIDI and SMPTE time-code jacks. The guest patch bay really speeds things up when we need to bring in additional gear or rental items for a session.

Speaking of patch bays, we built an extensive MIDI patch bay, comprising some  $1 \times 8$  MIDI Thru box circuits (adapted from the simple, 2-chip PC-900 optoisolator project that was published in the March 1986 issue of *Electronic Musician*), combined with a passive MIDI patch bay using  $\frac{1}{4}$ -inch TRS jacks and three-conductor patch cords. It isn’t high-tech or programmable, but it works.

We designed a custom stand (26 inches tall) for a Yamaha KX88 88-key MIDI controller. Placed near the

rear wall, it can readily be moved throughout the control room, because MIDI jacks tied to the MIDI patch bay are located at various points in the room.

Space is a major consideration in any control room, and ours is no exception. So rather than installing cumbersome synth stands in the control room, we used a wall-mount keyboard stand from Standtastic ([www.astralite.com](http://www.astralite.com)). Designed primarily for displaying electronic keyboards at music stores, the wall stand works equally well in control rooms and provides secure, adjustable

mounting. We have two synthesizers mounted at 45 degrees for easy playing. Below this we added an extra pair of 90-degree arms with a plywood shelf that supports two drum machines and a nonrack synth module.

Behind the door, a built-in cabinet has three drawers (for cables, supplies, tools, stomp boxes, and so on) and a bookshelf. The top of the 4-foot-tall cabinet provides an out-of-the-way place for beverages—no liquids are allowed near the console or electronics. Another small cabinet to the left of the couch stores music software, sample libraries, and documentation. Nothing is worse than being unable to find a manual when some piece of equipment doesn’t work during a session. We have also developed a “studio book”—a binder filled with information such as patch-bay maps, drum-machine note

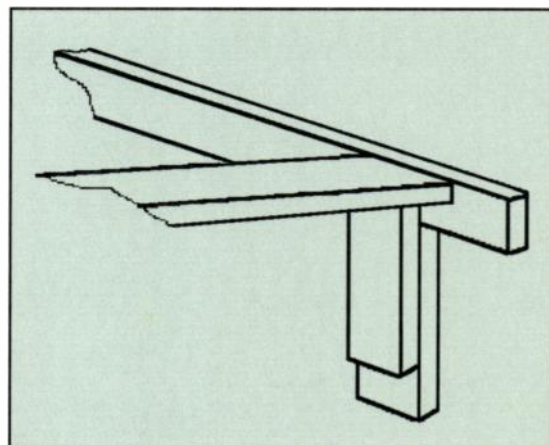


FIGURE 4: Right-side detail of corner shelf support.

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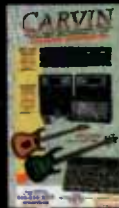
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numbers, reverb presets, MIDI assignments, and listings of CD-production music and sound-effects libraries. The studio book is a great time-saver.

A couch in the back of the room affords a comfortable haven for catching some shut-eye during all-night editing or mixing sessions. A coffee table next to the couch provides another safe place

The most important thing to remember is that this studio design is a far cry from the ultimate facility.

to put food or drinks, with a phone installed for cutting those all-important Andalusian record distribution deals—or at least for ordering a gourmet vegetarian pizza. Our budget forced us to eliminate plans for modern recessed cove lighting, so we instead settled on matching table lamps with three-way sockets in each corner.

### Nuts and Bolts

If you plan to repaint the room, do yourself a favor and complete this task *before* you install the countertops, monitor shelf, carpeting, and equipment. As mentioned earlier, the studio countertops are made of  $\frac{1}{4}$ -inch CDX plywood covered by gray indoor/outdoor carpeting and supported by columns (Fig. 2). These columns are built using a simple overlapping  $2 \times 4$  box frame sheathed by  $\frac{1}{4}$ -inch plywood (any grade) to add strength. Once the frame and sheath are nailed together, the bare column can be wrapped in carpeting (tacked along the back side). We used a similar technique for the console stand, although we substituted  $2 \times 6$  columns to support the  $\frac{1}{4}$ -ply counter under the console.

In all cases, contact adhesive keeps the carpet exactly where you want it. Just make sure to leave an extra edge on the countertop faces and corners so



# If I wanted a hobby,



# I would have picked stamp collecting.



**Recording isn't my hobby, it's what I do.**

And even though I do it at home, I still expect the sound to be dead on. So when the vocal tracks weren't cutting it anymore, I upgraded my mic to the **AT3525**. You wouldn't believe what that studio condenser does for my sound. Now the old ball mic is just collecting dust.



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E-mail: [sales@audio-technica.co.uk](mailto:sales@audio-technica.co.uk)



you can give the edges that trendy tuck-and-roll look.

#### Tips on Working with Carpet

1. Leave a little overlap when cutting pieces so that you can glue first and trim to exact size later.

2. Have someone available to help you place the pieces together once the glue has set.

3. Work outdoors, if possible. Glue fumes are hazardous.

Before you glue the carpeting, put

some strategically placed holes 1 to 2 inches in diameter on the corner shelf and countertops. This is to allow for cable drops for AC power, speaker cable, computer and video lines, and so on. After the carpet is attached, the area over these holes can be slit (no need to cut all the carpet away) to provide "invisible" cable drops.

To add stability to the counters, attach a 2 x 4 strip to the wall between the columns at the same height as the columns (a stud finder comes in handy

here), as shown in **Figure 3**. The 2 x 4s provide a third point of stability, as well as a handy place to pound those finishing nails that keep the countertops in place. If you are installing a line of columns along one wall, use one uninterrupted 2 x 4 for the entire length. This means that the columns between the first and last will have to be 1.5 inches (the depth of the 2 x 4) shallower than the outside columns, which leaves 1.5 inches behind the columns for running cables. The front face of the 2 x 4 is also handy for attaching AC power strips. In our studio, we route the AC cables up high, while keeping line-level wiring at floor level.

The key to this design is the unique positioning of the console, which faces directly into a corner.

You can use the same 2 x 4-on-the-wall technique for securing the corner shelf, although additional bracing is necessary. Two diagonal 2 x 4s buttressed over wall studs should suffice (see **Fig. 4**). Once the wall and diagonal 2 x 4s are in place, you can secure the carpeted corner shelf with finishing nails around the edging. Make sure that any holes for cable drops don't interfere with the placement of the diagonal braces.

The most important thing to remember is that this studio design is a far cry from the ultimate facility. Think of it as a starting point for designing your room. Add a bit of creativity, and you can create a customized work space in nearly any room—at an affordable price. The only limit is your imagination. ■

**JJ Jenkins and George Petersen** are San Francisco Bay Area-based composers/producers/artists with the group *Ariel*. Visit their Web site at: [www.jenpet.com](http://www.jenpet.com).

# Power MAX 16



2 x 800W @ 4  $\Omega$  mains  
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PROFESSIONAL RECORDING EQUIPMENT

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**COMPANY PROFILE:** Manley Laboratories, Inc. in recent years has expanded and thrived under EveAnna Manley's leadership. Our 11,000 sq. ft. building houses our own machine-shop, printed circuit board manufacture, audio transformer winding, engraving, and silk-screening facilities. All custom design, R&D, assembly, testing, and quality control processes are performed with precision and pride at the Manley factory, located just 35 miles east of Los Angeles.

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# 1

## Recorders, Sequencers & Mixers

In this wide-ranging section, we've included an assortment of digital and analog recording and mixing devices, as well as one essential category of software: sequencers.

Because the feature sets of analog and digital mixers differ significantly from each other, we've provided separate tables for the two categories. (Unlike their analog counterparts, for example, digital mixers generally offer some form of automation and often come with onboard dynamics processors, in addition to digital audio converters and digital inputs and outputs. Similarly, effects processors can be found on most digital mixers but only on a few analog boards.)

We list a wide variety of products in the Computer-Based Digital Audio Workstations table. Just exactly what constitutes a DAW is a matter of opinion; it can be hard to differentiate between an audio card bundled with digital audio editing software and a high-end dedicated system—especially dedicated systems that can be used with third-party programs as well as with the bundled software. Some audio cards have onboard synths, while others don't; given the proper software, however, they all can serve as DAWs. We took the cautious approach and cast a wide net, attempting to include every combination of audio card and audio-editing software.

Multitrack MiniDisc and cassette recorders have similar feature sets and intended applications, so we classified them together. Due to their digital nature, multitrack MiniDisc decks boast obvious features that cassette decks lack; some of these are not shown in the table because the salient point is the way they are implemented. For instance, the Yamaha MD4 and Tascam 564 MiniDisc recorders have playlists that let you play back sections of songs in a variable order. The Sony MDM-X4 doesn't provide a playlist, but its Section Editing feature lets you destructively move 4-track chunks of music. A few features weren't given their own columns in the table because they are typical of only one unit; for instance, only the Tascam MiniDisc deck has stereo S/PDIF outputs.

Modular hard-disk recorders are comparatively straightforward. Basically DAWs that do not require a computer; these units offer digital recording and usually have onboard mixers, but some mixers don't include hardware-control surfaces. These products also don't provide the in-depth waveform editing possible with a computer-based DAW, although you generally can perform cut, copy, paste, insert, and move operations.

The Digital Mixdown Machines chart includes DAT, 2-track MiniDisc, and stand-alone CD-Recordable decks. We did not include CD-R drives that require a computer and software.

We list MIDI sequencing and digital audio sequencing software in this section because these programs are essentially recorders and are thus integral parts of many music production studios.

50	Computer-Based Digital Audio Workstations
56	MiniDisc and Cassette Multitracks
56	Modular Digital Multitracks
58	Modular Hard-Disk Recorders
60	Digital Mixdown Machines
64	Sequencers (MIDI & Digital Audio)
70	Analog Mixing Consoles
72	Digital Mixing Consoles

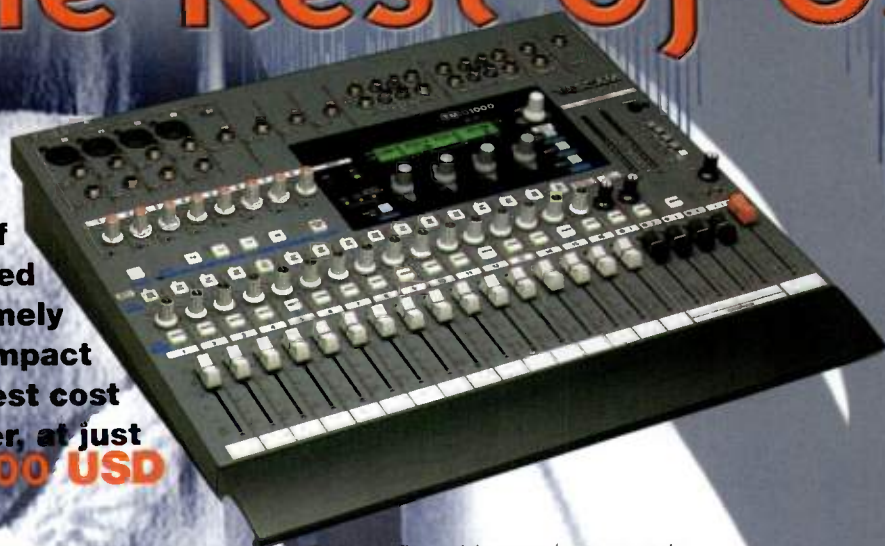


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with TASCAM's extremely  
powerful, compact  
TM-D1000 - the lowest cost  
digital mixer ever, at just  
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  - optional rack mount kit
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- stereo analogue and separate monitor outs
- 4 configurable aux / group outs
- assignable on-board digital effects and dynamics
- optional additional FX board doubles effects DSP
- 128 snapshot memories
- MIDI sequencer automation of console
- MIDI I/O, MMC and MTC slave and Word sync. I/O

### TASCAM

TM-D1000

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# COMPUTER-BASED DAWS

Manufacturer	Product	Analog I/O	Digital I/O	Platform Version	Bus Type	Plug-In Formats Supported	Sample Rate	A/D/A Converter/Bit Rate	Digital Recorder Resolutions (max)	Sync Types	MIDI Control
Aardwark	Aark 20/20+	8 1/4" TRS	S/PDIF (RCA, optical, Toslink)	Win 95, 98	PCI	DirectX	32, 44.1, 48 kHz	20-bit	24-bit	Word clock I/O; S/PDIF; optional ADAT	Yes
Aardwark	Aark Direct	2 1/4" RCA	S/PDIF (RCA)	Win 95, 98	PCI	DirectX	32, 44.1, 48 kHz	20-bit	24-bit	N/A	Yes
Aardwark	Aark Direct Pro	4 TRS-XLR combo/ 4 1/4" 2 RCA	S/PDIF (RCA)	Win 95, 98	PCI	DirectX	32, 44.1, 48 kHz	20-bit	24-bit	N/A	Yes
Akai	DPS12V2 Digital Personal Studio	6 1/4" TRS/ 2 RCA, 2 1/4"	1/1 S/PDIF	N/A	N/A	N/A	32, 44.1, 48 kHz	20-bit/24-bit	16-bit	MIDI clock w/SPP, MTC	Yes
Alesis	ADAT/EDIT	N/A	1/1 ADAT (8-channel)	Win 95, 98, Mac	PCI	ASIO, VST	44.1, 48 kHz	N/A	24-bit	ADAT sync (sample-accurate)	Yes
Antex	SC-22	2/2	N/A	Win 95, 98, NT	PCI	N/A	6.25-50 kHz	20-bit	N/A	LTC, VITC	No
Antex	SC2000	4/4 XLR	1/1 AES/EBU (S/PDIF and XLR)	Win NT	PCI	N/A	6.25-50 kHz	20-bit	N/A	SMPTE read/write, video	Yes
CreamWare	The Pulsar	2/2 RCA	8 (x2) ADAT, S/PDIF (optional AES/EBU)	Win 95, 98	PCI	SCOPE, Pulsar	32, 44.1, 48, 96 kHz	20-bit AD/24-bit DA	24-bit (96 kHz supported)	MTC, word clock	Yes
CreamWare	TripleDAT	2 RCA	2 channels S/PDIF	Win, Mac	ISA	TripleDat	32, 44.1, 48 kHz	18-bit	16-bit	MTC, MIDI clock, word clock	No
Creative Labs	SBLive Value Edition	1/8" mic/line	N/A	Win 95, 98, NT	PCI	EAX	8-48 kHz	16-bit	16-bit	MIDI	No
Creative Labs	Sound Blaster Live	1/8" mic/line	S/PDIF	Win 95, 98, NT	PCI	EAX	8-48 kHz	16-bit	16-bit	MIDI	No
Digidesign	Project II Studio	Up to 16 channels	Up to 16 channels	Mac	PCI	N/A	44.1, 48 kHz	24-bit	N/A	AVI, MIDI clock, SPP	Yes
Digidesign	ProTools/24	8-72 channels	8-72 channels	Mac, Win NT	PCI	Audio Suite, TDM	44.1, 48 kHz	24-bit (with 8) 88/24 I/O	N/A	Requires USD or other sync device	Yes
Digidesign	ProTools/24 MIX & MIX Plus	8-72 channels	8-72 channels	Mac, Win NT	PCI	Audio Suite, TDM	44.1, 48 kHz	24-bit (with 88/24 I/O)	N/A	Requires USD or other sync device	Yes
Digidesign	Tool Box Mac	2/2	2/2	Mac	PCI	Audio Suite	44.1, 48 kHz	16-bit	N/A	N/A	Yes
Digidesign	Tool Box Windows	2/2	2/2	Win 3.1, 95, 98, NT	PCI	N/A	44.1, 48 kHz	16-bit	N/A	AVI, MIDI clock, SPP	Yes
Digram	VX Pocket Sound Card for Laptops	Stereo, balanced full duplex	S/PDIF	Win, Mac	PCMCIA	DirectX (Win)	8-48 kHz	24-bit	N/A	N/A	No
Digram	VX222 Professional Sound Card	2/2 XLR	2/2 S/PDIF or AES/EBU	Win, Mac	PCI	N/A	11.025, 8, 16, 22.05, 24, 32, 44.1, 48 kHz	24-bit	24-bit	N/A	No
Digital Audio Labs	CardDeluxe	2/2 1/4" TRS	S/PDIF (gold-tipped RCA)	Win (Mac support tba)	PCI	Active Movie, DirectX	8, 11.025, 22.05, 32, 44.1, 48, 88.2, 96 kHz	24-bit/128x, 24-bit/64x	24-bit	Internal; external digital	No
Digital Audio Labs	V8 System	Up to 16/16 1/4" TRS	S/PDIF (coaxial/optical); ADAT (optical)	Win	ISA, PCI	V8 native plug-ins only (Waves, Antares)	44.1, 48 kHz (variable with external clock)	16-bit/64x, 20-bit/8x	16-bit	External sync to LTC/VITC, WC (w/Timing Gear option), ADAT, TDIF	No
E-mu Systems	APS	4/2	2 S/PDIF	Win 95, 98, NT	PCI	DirectX; VST via ASIO drivers	8-48 kHz	20-bit	20-bit (48 kHz)/32-bit (internal)	MTC	Yes

Tracks/Virtual Tracks	# of Locate Points	Main Synth Chip Set	# of Programs ROM/RAM	Sample ROM/RAM	Polyphony/Multitrack	Effects/Dynamic Processing	Additional Features	Options	Price
N/A	N/A	N/A	N/A	N/A	N/A	N/A	Shielded break out box w/outboard A/D; Steinberg ASIO drivers; virtual monitor mixer	ADAT, TDIF; AES/EBU; 19" rack mount	\$899
N/A	N/A	N/A	N/A	N/A	N/A	Yes/Yes	Virtual monitor mixer	AES/EBU; 19" rack mount	\$425
N/A	N/A	N/A	N/A	N/A	N/A	Yes/Yes	Virtual monitor mixer	AES/EBU; 19" rack mount	\$645
12/250	112	N/A	N/A	N/A	N/A	Yes/Yes (optional)	Burn audio CDs; MIDI automated mixing	Internal 2 GB hard disk; EBZM internal stereo FX processor	\$1,499
8/12	4	N/A	N/A	N/A	N/A	N/A	Transfers and editing from ADAT A13 20-bit analog/optical interface		\$399
4/0	N/A	N/A	N/A	N/A	N/A	N/A	Multi-card capability; Wintel & Alpha compatible		\$595
N/A	N/A	N/A	N/A	N/A	N/A	N/A	Video burning		\$895
Software dependent	Software dependent	Analog Devices SHARC	Software dependent	Uses host RAM and AKAI CD-ROMs	Up to 64 (more optional)	Yes/Yes	32-channel digital mixer; internal/external routing of hardware/software	Library of programmable synths and other virtual devices	\$1298
0/256	99	N/A	N/A	N/A	N/A	Yes/Yes	CD writing; warp mode (patch FX to/from external devices; record/play on analog and digital chans simultaneously)	FireWalkers Effects plug-ins; Osiris Audio Restoration Software plug-ins	\$998
N/A	N/A	E-mu	1,000+	N/A	256 voices (software)/32 channels	Yes/Yes	Game software		\$99
N/A	N/A	E-mu 10K1	1,000+	N/A	256 voices (software)/32-channel	Yes/Yes	Software bundle: Cakewalk, Sound Forge Mixman, digital I/O card		\$199
16/128	Infinite	N/A	N/A	0/32 MB	32 voices/Yes (SampleCell II Plus)	N/A	Project II PCI card; choice of 882/20 or ADAT Bridge I/O; SampleCell II Plus; Logic Audio AV; MasterList CD	Sample libraries	\$2,495
32-64/128	Infinite	N/A	N/A	N/A	N/A	Yes/Yes	Pro Control support; Digi Rack plug-ins (EQ, dyn, etc.)	DSP Farm PCI; 688/24 and 882/20 ADAT bridge I/O	\$5,995
64/128	Infinite	N/A	N/A	N/A	N/A	Yes/Yes	Pro Control support; Digi Rack plug-ins incl (EQ, dyn, etc.)	MIX Farm card (DSP); MIX I/O card; 888/24, 882/20, or ADAT bridge I/O	\$7,995 (MIX plus) \$9,995
16/128	Infinite	N/A	N/A	N/A	N/A	N/A	D-1x; D-F1; Peak LE; SFX Machine Lite; Audio Media III card; ProTools	Audio Suite plug-ins; Master List CD; Sound Designer II; Sample Cell II Plus	\$895
16/128	Infinite	N/A	N/A	N/A	N/A	N/A	Audiomedia III card; Session; Logic Audio AV; Sound Forge XP; Avid Rock		\$549
N/A	N/A	N/A	N/A	N/A	N/A	N/A			\$729
N/A	N/A	N/A	N/A	N/A	N/A	N/A	Two general-purpose interface inputs/outputs		\$549
N/A	N/A	N/A	N/A	N/A	N/A	N/A	Multiple-card support		\$595
16/0	N/A	N/A	N/A	N/A	N/A	N/A	A V8 system consists of the main board and one V8 I/O device	Big Block I/O; 8 in/8 out (\$1995); MDM custom for ADAT (\$695); MDM custom for DA88 (\$795); Deuce Coupe (\$695)	Starts at \$2,500
N/A	N/A	E-mu 10K1	0/unlimited	0/32 MB	64/32	Yes/Yes	Drive bay I/O; guitar/mic inputs	Separate headphone out w/volume control	\$699



# COMPUTER-BASED DAWS

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	Digital Recorder Resolutions (max)	Sync Types	MIDI Control
E-mu Systems	PCMCIA Card 8712	1/8" (mono mic input)	8 S/PDIF optical output (Toslink)	Win 95, 98	PCMCIA Type II	N/A	11,025, 22,050, 44.1 kHz (play/record)	16-bit	16-bit	MTC	Yes
EGO-Systems	WaMi Box	2/4 RCA	2/2 S/PDIF (optical and coaxial)	Win 95, 98, 2000, NT	PCMCIA	DirectX	4-44.1 kHz	20-bit	16-bit (internal)/20-bit output	MTC	Yes
EGO-Systems	WaMi Rack	2/8 1/4" TRS	2/2 S/PDIF (optical and coaxial)	Win 95, 98, 2000	PCI	DirectX	32-50 kHz	20-bit	24-bit	SMPTE, MTC; word clock; Superclock	Yes
EGO-Systems	Waveterminal	2/2 1/4" TRS	2/2 S/PDIF (coaxial)	Win 95, 98, 2000, NT	PCI	DirectX	32-50 kHz	20-bit	24-bit	Internal, S/PDIF digital, multiscard sync	No
Emagic	Audiowerk8	2/8 RCA	1/1 S/PDIF	N/A	PCI	N/A	32-50 kHz	18-bit	N/A	Digital in	No
Ensoniq	Paris 2 (442)	4/4	2 S/PDIF	Mac; Win 95, 98	PCI	DirectX; VST	44.1, 48 kHz	20-bit	24-bit	MTC; word clock	Yes
Ensoniq	Paris 3	8/8 1/4" TRS per module	S/PDIF; ADAT module	Mac; Win 95, 98	PCI	DirectX; VST	44.1, 48 kHz	24-bit	24-bit	MTC; SMPTE, ADAT (master only); word clock	Yes
Ensoniq	Paris Concept	2/2	N/A	Mac; Win 95, 98	PCI	DirectX; VST	44.1, 48 kHz	20-bit	24-bit	MTC	Yes
Event Electronics	Darla	2/8 RCA	N/A	Mac; Win	PCI	N/A	32, 44.1, 48 kHz	20-bit	N/A	N/A	No
Event Electronics	Gina	2/8 1/4"	1/1 stereo RCA	Mac; Win	PCI	N/A	32, 44.1, 48 kHz	20-bit	24-bit	S/PDIF clock	No
Event Electronics	Layla	8/10 1/4" TRS balanced	1/1 stereo RCA	Mac; Win	PCI	N/A	8-50 kHz	20-bit	24-bit	S/PDIF clock; word clock; Superclock; MTC	Yes
Frontier Design	Dakota	Available with Tango 24 (8/8) or Zulu (4/8) external converters	16/16 ADAT optical (exp to 32/32); 2/2 S/PDIF (Toslink or RCA)	Win 95, 98	PCI	N/A	44.1 or 48 kHz internal; locks to digital inputs from 39-51 kHz	24-bit on Tango 24; 20-bit on Zulu	24-bit	ADAT 9-pin sync in; MTC, SODA 9 (SMPTE on digital audio); other sync optional	No
Frontier Design	Wave Center	Available with Tango 24 (8/8) or Zulu (4/8) external converters	8/8 ADAT optical (exp to 16/16); 2/2 S/PDIF (Toslink or RCA)	Win 95, 98	ISA	N/A	44.1 or 48 kHz internal; locks to digital inputs from 39-51 kHz	24-bit on Tango; 20-bit on Zulu	24-bit	MTC	No
Gadget Labs	Wave/824 Digital Recording Interface	8/8	2/2	Win 95, 98, NT; Mac	PCI	N/A	22, 32, 44.1, 48 kHz	24-bit	24-bit	MTC; word clock	No
Guillemot	Maxi Studio Isis	8/4 1/4"	2/2 S/PDIF optical and coaxial	Win	PCI	DirectX	32, 44.1, 48 kHz (master or slave)	20-bit	16-bit	MTC; MC	Yes
Korg	12/12 IO	1/4" TRS in/out	ADAT optical; S/PDIF	Mac; Win	PCI	N/A	44.1, 48 kHz	20-bit; 18-bit	20-bit via S/PDIF; 16-bit via ADAT	ADAT 9 pin sync; word clock I/O (BNC)	No
Mark of the Unicorn	MOTU Audio 2408	8/2	3x8-ch TDIF; 3x8-ch ADAT; 1/2 S/PDIF	Mac; Win	PCI	N/A	44.1, 48 kHz	20-bit	24-bit	Internal; word clock; Lightpipe; ADAT sync; control track (DTP sync)	No
Micro Technology	MicroSound/Krystal	2/2	AES/EBU; S/PDIF	Win	PCI	DirectX	8, 9.45, 10, 11.025, 12, 16, 128.9, 20, 22.05, 24, 32, 37.8, 40, 44.1, 48 kHz	N/A	24-bit	Video blackburst; SMPTE (all)	No
Midiman	DMan 2044	4/4 1/4"	N/A	Win 95, 98	PCI	ASIO; DirectX	44.1, 48 kHz	20-bit	16-bit	N/A	No
Midiman	DMan PCI	2/2 RCA gold	N/A	Win 95, 98, NT	PCI	MME; DirectX	44.1, 48 kHz	18-bit	16-bit	MIDI	Yes

Tracks/Virtual Tracks	# of Locate Points	Main Synth Chip Set	# of Programs ROM/RAM	Sample ROM/RAM	Polyphony/Multitimbral	Effects/Dynamic Processing	Additional Features	Options	Price
N/A	N/A	E-mu	0/unlimited	N/A	32/16	Yes/Yes	Software package		\$395
N/A	N/A	mel RISC DSP	0/16	N/A	64/32	Yes/Yes	Mic Pre w/effects; 4-ch surround, headphone amp; DirectX; Pro3D; sample-rate converter	AES/EBU converter; 24-bit A/D-D/A box	\$599
N/A	N/A	N/A	N/A	N/A	N/A	N/A	SMPTE read/write; 8 audio-signal LEDs	AES/EBU converter; 24-bit A/D-D/A box	\$699
N/A	N/A	N/A	N/A	N/A	N/A	N/A	32-bit PCI bus-mastering; WDM driver with DirectX; Win 2000 ready	AES/EBU Converter; 24-bit A/D-D/A box	\$349
N/A	N/A	N/A	N/A	N/A	N/A	N/A	Logic Audio Discovery; VMR; Cool Edit Pro LE (Windows only) and Zap (Mac only)		\$799
16/128	99	N/A	N/A	N/A	N/A	Yes/Yes	Hardware control surface w/full complement of faders, knobs, and switches	Upgrade path to Modular Expansion Chassis (MEC)	\$3,395
128	99	N/A	N/A	N/A	N/A	Yes/Yes	Control surface w/full complement of controls	Additional inputs/outputs; ADAT sync/I/O; SMPTE	\$3,895
16/128	99	N/A	N/A	N/A	N/A	Yes/Yes (optional)	Can be fully upgraded w/Paris MEC	FX (EDS-FX)	\$1,299 (Concept FX) \$1,799
N/A	N/A	N/A	N/A	N/A	N/A	N/A	Detachable RCA breakout box; multitrack recording/editing software included		\$449
N/A	N/A	N/A	N/A	N/A	N/A	N/A	Multitrack recording/editing software included		\$599
N/A	N/A	N/A	N/A	N/A	N/A	N/A	Multitrack recording/editing software included		\$1,099
N/A	N/A	N/A	N/A	N/A	N/A	N/A	MIDI 2/2 (expandable to 8/8 w/optional Sierra box); includes Cool Edit Pro SE	Bundle prices avail w/Tango or Zulu	\$649
N/A	N/A	N/A	N/A	N/A	N/A	N/A	MIDI 1/3 (1 input, 3 independent outputs); input monitoring (ADAT, S/PDIF)	Bundle prices avail w/Tango or Zulu	\$399
N/A	N/A	N/A	N/A	N/A	N/A	N/A	MIDI port included; optional S/PDIF card	S/PDIF card w/optical I/O and word clock	(Win) \$499.95; (Mac) \$599.95
8/infinite	N/A	RISC-based Dream-9707	368/0	0/4-36 MB	64	Yes/No	MIDI I/O/T (external rack)		\$399
N/A	N/A	N/A	N/A	N/A	N/A	N/A			\$900
N/A	11	N/A	N/A	N/A	N/A	Yes/Yes	Stand-alone format converter; supports audio transfer via ADAT or digital timepiece sync	Additional I/O boxes available for a total of 72 inputs/outputs (\$695)	\$995
Unlimited	32	N/A	N/A	284 KB	N/A	Yes/Yes		Noise remove; time change; pitch change; sample rate converter; Karaoke mastering	Starts at \$2,395
N/A	N/A	N/A	N/A	N/A	N/A	N/A			\$349.95
N/A	N/A	Crystal	128	N/A	64/16	Yes (synth only)/No	MIDI; internal CD-ROM connection		\$179.95



# COMPUTER-BASED DAWS

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	Digital Recorder Resolutions (max)	Sync Types	MIDI Control
Mytek Digital	DAW 9624	8/8 XLR (expandable)	4 AES/EBU and ADAT (optional TDIF)	Mac; Win 95, NT; BEOS; Linux	PCI	VST; DirectX	44.1, 48, 88.2, 96 kHz	24-bit	32-bit (depends on software)	Word clock; video; (SMPTE w/extra hardware)	Yes
Peavey	StudioMix	8 RCA	N/A	Win 95, 98, NT	N/A	DirectX	Up to 48 kHz	N/A	32-bit	SMPTE; MTC	Yes
Precision Analog Systems	SRD-1 Sample Rate Converter	N/A	N/A	N/A	N/A	N/A	All	N/A	N/A	Word clock; Superclock	No
SADiE	Artemis	8, 16, 24 channels (balanced)	8, 16, or 24 AES/EBU	Win	N/A	Cedar; Syncroarts; DirectX; Waves	Up to 192 kHz	20-bit	32-bit (floating point)	SMPTE; VITC; AES sync	No
SEK'D	ARC44	4/4	N/A	Win 95, 98	ISA	N/A	44.1, 48 kHz	16-bit	N/A	Multicard	No
SEK'D	ARC88	8/8	Toslink; S/PDIF	Win 95, 98, NT; Mac	PCI	N/A	32, 44.1, 48 kHz	16-bit	24-bit	S/PDIF (dual card)	No
SEK'D	PRODIF 24	1 TRS out	Toslink; 1/4" TRS; AES/EBU	Win 95, 98	ISA	N/A	32, 44.1, 48 kHz	18-bit	24-bit	AES/EBU; S/PDIF (dual card)	No
SEK'D	PRODIF Gold	N/A	Optical Toslink and coaxial S/PDIF; AES/EBU	Win 95, 98, NT; Mac; ASIO	PCI	N/A	32, 44.1, 48 kHz	N/A	24-bit	ADAT PLL lock (up to 3 cards)	No
SEK'D	PRODIF Plus	1/1	S/PDIF; AES/EBU; ADAT	Win 95, 98, NT; Mac; ASIO	PCI	N/A	11-96 kHz	20-bit	24-bit (96K)	ADAT PLL lock; AES; S/PDIF	No
SEK'D	Prodif 32	N/A	Optical Toslink & Coaxial S/PDIF; AES/EBU	Win 95, 98, NT; Mac; ASIO	PCI	N/A	32, 44.1, 48 kHz	N/A	24-bit	AES/EBU; S/PDIF	No
SEK'D	Prodif 96	1 stereo in, 96K	S/PDIF; AES/EBU; Toslink	Win 95, 98, NT; Mac	PCI	N/A	32-96 kHz	20-bit	24-bit (96 kHz)	AES; S/PDIF	No
SEK'D	Prodif 96 Pro	1/1 stereo 96K	S/PDIF; AES/EBU; ADAT	Win 95, 98, NT; Mac	PCI	N/A	11-96 kHz	20-bit	24-bit (96 kHz)	Word clock in; ADAT PLL lock; AES; S/PDIF	No
SEK'D	Samplitude 2496	Unlimited	Unlimited	Win 95, 98, NT	N/A	DirectX	32, 44.1, 48, 88.2, 96 kHz	N/A	32-bit (floating point)	MIDI clock; MTC; SMPTE (all rates)	Yes
Sonorus	STUDI/O	Stereo monitor output	16 via 2x8 optical interfaces	Win 95, Win NT; Mac; BEOS	PCI	N/A	44.1, 48, 88.2, 96 kHz	N/A	24-bit	MTC in, or sample-accurate via optional backplate	No
Voyetra	Montego II Home Studio	1/2	S/PDIF (RCA or optical)	Win 95, 98, NT 4.0	PCI	N/A	Up to 48 kHz	18-bit	18-bit	SMPTE; MTC	Yes
Voyetra	Multisound FIJI	2/2	Optional S/PDIF I/O	Win 95, 98, NT 4.0	ISA	N/A	Up to 48 kHz	20-bit	20-bit	N/A	No
Voyetra	Multisound Pinnacle	2/2	Optional S/PDIF I/O	Win 3.1, 95, 98, NT 4.0	ISA	N/A	Up to 48 kHz	20-bit	20-bit	SMPTE; MTC	Yes
Voyetra	Pinnacle Project Studio	3/1	Coaxial S/PDIF	Win 3.1, 95, 98, NT 4.0	ISA	N/A	Up to 48 kHz	20-bit	20-bit	SMPTE; MTC	Yes
Xytar	Audio Digital Mastering System (ADMS)	2/2, 4/4, 8/8 or 16/16	1, 2, 4 or 8 S/PDIF	Stand alone	N/A	Proprietary	11, 22,050, 32, 44,100, 48 kHz	20-bit	16-bit	MTC; SMPTE; 30d; 30nd; 29.97d; 29.97nd	Optional
Xytar	Audio Digital Mastering System 32 (ADMS32)	2/2, 4/4, 8/8, 16/16, 24/24 or 32/32	1, 2, 4, 8, 12 or 16 S/PDIF	Stand alone	N/A	Proprietary	11, 22,050, 32, 44,100, 48 kHz	20-bit	16-bit	MTC; SMPTE; 30d; 30nd; 29.97d; 29.97nd	Optional
Yamaha	DSP Factory	2/2 RCA	2/2 S/PDIF or AES/EBU (coaxial)	Win 95, 98, NT; Mac PPC	PCI	Software Dependent	44.1, 48 kHz	20-bit	32-bit (16 and 20-bit available)	Software/hardware dependent	Software dependent
Zefiro Acoustics	ZA2	0/1 RCA	Optical and coaxial S/PDIF; AES/EBU	Win 95, 98, NT; DOS 3.1	ISA	N/A	8-60 kHz	16-bit (D/A)	24-bit	Superclock; word clock	No

Tracks/Virtual Tracks	# of Locate Points	Main Synth Chip Set	# of Programs ROM/RAM	Sample ROM/RAM	Polyphony/Multitimbral	Effects/Dynamic Processing	Additional Features	Options	Price
8 (expandable to 64)	N/A	N/A	N/A	N/A	N/A	Optional	Runs most third party software packages		\$6,495
8/256	20	N/A	N/A	N/A	N/A	Yes/Yes	MIDI		\$899
N/A	N/A	N/A	N/A	N/A	N/A	N/A			\$149.95
Variable/unlimited	Unlimited	N/A	N/A	N/A	N/A	Yes/Yes	Surround panning; full automation; PQ editing; MMC	Portia nonlinear video playback	\$15,495 (turnkey, includes PC)
4/0	N/A	N/A	N/A	N/A	N/A	N/A	Input gain amp		\$319
8/0	N/A	N/A	N/A	N/A	N/A	N/A	Input gain amp		\$639
2/0	N/A	N/A	N/A	N/A	N/A	N/A			\$319
8/0	N/A	N/A	N/A	N/A	N/A	N/A	Digital CD-ROM input		\$559
10/0	N/A	N/A	N/A	N/A	N/A	N/A	Digital CD-ROM input		\$450
2/0	N/A	N/A	N/A	N/A	N/A	N/A	Digital input from CD-ROM		\$479
N/A	N/A	N/A	N/A	N/A	N/A	N/A	Digital input from CD-ROM		\$639
10/0	N/A	N/A	N/A	N/A	N/A	N/A	Digital input from CD-ROM		\$699
999	99	N/A	N/A	N/A	N/A	Yes/Yes			\$799
16/0	N/A	N/A	N/A	N/A	N/A	N/A		I/O backplate (\$149)	\$849
System dependent	N/A	Aureal 8830	N/A	N/A	128/256	Yes/Yes	Digital Orchestrator Pro; Roland GS compliant wavetable daughter card		\$299
System dependent	N/A	N/A	N/A	N/A	N/A	Yes/No	Digital Orchestrator SE	S/PDIF digital I/O; MIDI synth module	\$299.95
System dependent	N/A	N/A	N/A	Up to 48 MB	64	N/A	Digital Orchestrator SE	S/PDIF digital I/O; MIDI synth module	\$389.95
System dependent	N/A	N/A	N/A	Up to 48 MB	64	Yes/No	Digital Orchestrator Pro; Kurzweil wavetable sampler; Pinnacle patch editor; librarian		\$459.95
16/unlimited	Unlimited	N/A	N/A	N/A	N/A	Y/Y	17" 1600X1200 monitor; CD master burner; 3 hours of 2, 4, 8 or 16-channel recording; JAZ drive; CD reader for direct CD copy	Voice command/readback for sight impaired users; 24 or 32-track analog mic input mixer	\$3,499 to \$9,999
16 or 32/unlimited	unlimited	N/A	N/A	N/A	N/A	Y/Y	17" 1600X1200 monitor; CD master burner; 3 hours of 2, 5, 8, 16, 24 or 32-channel recording; JAZ drive; CD reader for direct CD copy	Voice command/readback for sight impaired users; 24 or 32-track analog mic input mixer	\$5,499 to \$18,999
16/software dependent	Software dependent	N/A	N/A	N/A	N/A	Yes/Yes	Real-time mixing; 2 card cascade for 32-track playback; all parameters can be automated	AX44 Analog audio expansion (\$299); AX88 24-bit audio expansion (\$999); AX16-AT ADAT expansion (\$299)	\$999
N/A	N/A	N/A	N/A	N/A	N/A	N/A	Automatic digital sample rate conversion		\$495



# MINIDISC AND CASSETTE MULTITRACKS

Manufacturer	Product	Format	# of Tracks/ Simultaneously	Mixer Configuration	Channel Inputs	# of Mic Trims	EQ (type)	# of Aux Sends/ Aux Returns	# of Direct Outs/Inserts
Fostex	X-24	Cassette	4/4	4x2	(2) 1/4"; (2) XLR	2	N/A	N/A	N/A
Fostex	X-34	Cassette	4/4	4x2	(4) 1/4"; (2) XLR	2	High and low shelving	2/2 (stereo)	4/2
Sony	MDM-X4 MKII	MiniDisc	4/4	10x4	(10) 1/4"; (2) XLR	4	3-band	2/2 (stereo)	4/0
TASCAM	414 Portastudio	Cassette	4/4	4x2	(8) 1/4"	4	High and low shelving	2/2	N/A
TASCAM	424 MKII Portastudio	Cassette	4/4	8x2	(4) 1/4"; (4) XLR	4	3-band w/mid sweep	2/2	N/A
TASCAM	488 MKII Portastudio	Cassette	8/4	12x4x2	(8) 1/4"; (2) XLR; (2) 1/4" TRS	4	3-band w/mid sweep	2/2	N/A
TASCAM	564 Digital Portastudio	MiniDisc	4/4	12x2	(12) 1/4"; (4) XLR	4	3-band w/mid sweep	2/2	4/2
TASCAM	Porta 02	Cassette	4/2	4x2	(2) 1/4"	2	N/A	N/A	N/A
Yamaha	MD4	MiniDisc	4/4	8x4	(4) 1/4"	4	3-band parametric	1/2	4/0
Yamaha	MT4X	Cassette	4/4	4x2	(5) 1/4"	4	3-band parametric	2/4	4/0
Yamaha	MT50	Cassette	4/4	4x2	(5) 1/4"	4	High and low shelving	1/2	4/0

# MODULAR DIGITAL MULTITRACKS

Manufacturer	Model	Tape Format	ADC	DAC	Sampling Rate	Frequency Response	Dynamic Range	Signal-to- Noise Ratio	Crossfade Times
Alesis	LX20 20-Bit Digital Audio Recorder	S-VHS	20-bit/64x	20-bit/64x	44.1, 48 kHz	20 Hz–20 kHz (±0.5 dB)	97 dB	N/A	11, 21, 32, 43 ms
Alesis	M20 20-Bit Digital Audio Recorder	S-VHS	20-bit/64x	24-bit/128x	44.1, 48 kHz	20 Hz–20 kHz (±0.5 dB)	D/A: 102 dB A/D: -115dB	N/A	5.4 ms–1.37 sec
Alesis	XT20 20-Bit Digital Audio Recorder	S-VHS	20-bit/128x	24-bit/128x	44.1, 48 kHz	20 Hz–20 kHz (±0.5 dB)	102 dB	N/A	11, 21 32, 43 ms
HNB	HNB Genex 8000 (digital only)	Magneto optical disk	20-bit	20-bit	32.0, 44.056, 44.1, 47.952, 48 kHz	N/A	N/A	N/A	N/A
HNB	HNB Genex GX8500	Magneto optical disk or HD	24-bit	24-bit	32.0, 44.1, 48, 88.2, 96, 126.4, 192 kHz	1 Hz–20 kHz	N/A	N/A	N/A
Studer	Studer V-Eight	S-VHS ADAT type II	24-bit	24-bit	44.1, 48 kHz	20 Hz–20 kHz (±0.3 dB)	A/D: 105 dB, D/A: 100 dB	N/A	5.4 ms–1.4 sec
TASCAM	DA-38	Hi 8	18-bit/64x	20-bit/8x	44.1, 48 kHz	20 Hz–20 kHz (±0.5 dB)	>92 dB	>92 dB	10–90 ms (in 10 ms steps)
TASCAM	DA-88	Hi 8	16-bit/64x	18-bit/8x	44.1, 48 kHz	20 Hz–20 kHz (±0.5 dB)	>92 dB	>92 dB	10–90 ms (in 10 ms steps)

# of Locate Points	Tape Speed (ips)	Pitch Control Range	Noise Reduction (type)	Frequency Response	Signal-to-Noise Ratio	Total Harmonic Distortion	Price
N/A	3-3/4	± 5%	Dolby B	Mixer: 20 Hz-20 kHz; recorder: 40 Hz-14 kHz	58 dB	2%	\$389
N/A	3-3/4	±50% ±12%	Dolby B	Mixer: 20 Hz-20 kHz; recorder: 40 Hz-14 kHz	58 dB	2%	\$499
11	N/A	±8%	N/A	5 Hz-20 kHz	>94 dB	N/A	\$895
1	3-3/4	±12%	dbx Type II	40 Hz-16 kHz	85 dB	1% (@1 kHz)	\$449
2 plus RTZ	3-3/4	±12%	dbx Type II	40 Hz-16 kHz	95 dB w/dbx	1% (@1 kHz)	\$599
2 plus RTZ	3-3/4	±12%	dbx Type II	20 Hz-22 kHz	95 dB w/dbx	1.3% (@400 Hz)	\$1,499
20	N/A	±9.9%	N/A	20 Hz-20 kHz	>88 dB	<0.008%	\$1,499
N/A	1-7/8	N/A	N/A	40 Hz-12.5 kHz	60 dB	1.5% (@1 kHz)	\$199
10	N/A	±6%	N/A	20 Hz-20 kHz	85 dB	0.01% (@1 kHz)	\$1,999
3	1-7/8, 3-3/4	±10%	dbx	Mixer: 20 Hz-20 kHz; recorder: 40 Hz-18 kHz	85 dB w/dbx	2% (@400 Hz)	\$599
1	3-3/4	±10%	dbx	Mixer: 20 Hz-20 kHz; recorder: 40 Hz-16 kHz	85 dB w/dbx	1.5% (@400 Hz)	\$479

# of Locate Points	Total Harmonic Distortion	Channel Crosstalk	Analog I/O	Digital I/O	Onboard Sync	Log/Shuttle Control	Special Features	Options	Price
5	>.009%	OK	RCA-10	Alesis 8-channel optical digital interface	ADAT	No	Auto-punch, rehearse mode; loop	BRC master remote control; ADAT PCR Personal Computer Recording System	\$1,899
99	>.003%	<90 dB	+4 dBu on Elco (8/8); +4 dBu on XLR	Alesis 8-channel optical digital interface	ADAT, SMPTE/EBU	Yes	Auto-punch, rehearse mode; loop; track copy; TC track; aux track	CADI Controller Autolocator, Desktop Interface, Digital Remote Meter	\$4,999
10	<.005%	<-90 dB	+4 dBu on Elco (8/8); RCA-10	Alesis 8-channel optical digital interface	ADAT	No	Auto-punch, rehearse mode; loop; track copy	BRC master remote/synchronizer; Personal Computer Recording System	\$2,599
0	N/A	N/A	N/A	AES/EBU; XLR; IEC, 958 Type II, RCA	LTC, Video, word clock, AES/EBU, ITC958II	Yes	SCSI 50 pin, up to 96 kHz w/external converters		\$6,860
100	N/A	N/A	Bal +4 on 25-pin D-sub (8/8); AD 8-in, DA 8-out	S/PDIF 2; AES; DSD	LTC, Biphase, Video, word clock	Yes	Varispeed; Ethernet; Scg 50-pin		\$8,035 w/o drive
100	A/D: 105 dBfs, D/A: 100 dBfs (@ 1 kHz "A" weighted)	<90 dB	XLR and Elco	ADAT optical; AES optical	Word clock; video; digital in; SMPTE in; SMPTE reader/generator; Sony 9-pin RS-422	Yes	Linear aux track; SMPTE track; monitor mixer	Cockpit remote control, remote meters	\$8,495
2 plus RTZ	<0.008%	<-90 dB	Bal +4 dBm on 25-pin D-sub (8/8); RCA -10 dBu (8/8)	TDIF on D-sub	N/A	Yes	Electronic patch bay; digital track copy	MMC-38 MIDI interface; AES/EBU or S/PDIF w/optional interface	\$3,499
2 plus RTZ	0.007%	<-90 dB	Bal +4 dBm on 25-pin D-sub (8/8); RCA -10 dBu (8/8)	TDIF	See options	Yes	108 minutes of record/playback time with standard 120 tape	RC-848 controllers, 54-84 sync card; IF series dgtl interfaces; AES/EBU or S/PDIF w/optional interface	\$4,799



# MODULAR HARD-DISK RECORDERS

Manufacturer	Model	# of Tracks	# of Virtual Tracks	Levels of Undo	# of Locate Points	Analog Inputs	Analog Outputs	Digital I/O	Backup Options	Log/Shuttle Control
Akai	DR16, DR16HD	16	5 takes (takes can be multiple tracks)		100	(8) 1/4" TRS	(16) 1/4" TRS	2-channel AES/EBU and S/PDIF, options: 8/16-ch ADAT, 8-channel AES/EBU, 8-ch TDIF	DAT, ADAT optical; TDIF, SCSI DAT, Exabyte, SCSI disk copy to removable media	Yes
Akai	DR16 Plus	16	5 takes (takes can be multiple tracks)		108	(8) 1/4" TRS	(16) 1/4" TRS	AES/EBU, S/PDIF	DAT, ADAT, DA-88; SCSI tape drives	Yes
Akai	DR8, DR8HD	8	5 takes (takes can be multiple tracks)	1	100	(8) 1/4" TRS	(12) 1/4" TRS	2-ch AES/EBU and S/PDIF, options: 8/16-ch ADAT, 8-ch AES/EBU; 8-ch TDIF	DAT, ADAT optical, TDIF, SCSI DAT; Exabyte; SCSI disk copy to removable media	Yes
E-mu Systems	Darwin	8	800 (100 versions)	100	40	(4, exp to 8) 1/4"	(8) 1/4"	S/PDIF, optical, ADAT	Jaz, SyJet, SCSI DAT, ADAT optical, QIC/SCSI, plus copy protect to other SCSI device	Yes
Fostex	D-108	8	16	1	99	(8) RCA	(8) RCA	S/PDIF	ADAT, DAT, SCSI	Yes
Fostex	D-160V2	16	8	1	99	(8) RCA	(16) RCA	S/PDIF	(2) ADAT; DAT; SCSI	Yes
Fostex	FD-4	4	2	1	8	4 (+4 aux returns)	Stereo out; monitor out; aux 1/2 sends	S/PDIF optical	DAT, SCSI (optional)	Yes
Fostex	FD-8	8	16	1	6	(8) 1/4" (+4 aux 1/2 return)	(4) RCA (+2 aux sends)	S/PDIF	DAT, SCSI (optional)	Yes
Independent Audio	Sonifex Ltd. Courier Hard Disk Location Recorder	2	0	1	99	(2) XLR	(2) XLR	AES out	PCMCIA hard drive	Yes
Korg	D8	8	400	1	3	(2) 1/4" TRS, RCA	(4) RCA: 1/4" (headphone jack)	S/PDIF optical	DAT, SCSI	Yes
Otari	RADAR II	24	Unlimited	99	100	24 channels bal 25-pin D-sub connectors (3)	24 channels bal 25-pin D-sub connectors (3)	24-channel TDIF or AES/EBU	SCSI, Exabyte, TDIF	Yes
Roland	VS-1680EX Digital Studio Workstation	16	256	999	1,064	(2) XLR, (6) TRS, 1 gtr	8	S/PDIF 1 in/2 out	CD-R; CD-RW; external SCSI, DAT	Yes
Roland	VS-840EX Digital Studio Workstation	8	64	999	1,008	4	4	(2) S/PDIF (coax/optical) outs	SCSI external HD, removable SCSI media	Yes
Roland	VS-880EX Digital Studio Workstation	8	128	999	1,032	(6) TRS	(4) RCA	(10) S/PDIF in, (2) S/PDIF out	CD-R; CD-RW; external SCSI, DAT	Yes
Studer	DAR OM8	8	N/A	1	2	8	8	2-channel AES/EBU, S/PDIF (coax/optical)	Magneto-optical drive	Yes
Vestax	HDR-V8	8	8	1	10	(8) 1/4" XLR	(10) 1/4"	S/PDIF	DAT; SyQuest; SyJet IDE-type carts, ADAT and TDIF (optional)	Yes

Channel EQ	Synchronization	Time-Code Rates	# of Expansion Ports	ADC	DAC	Sample Rates	SCSI	Maximum Addressable Hard Drive Size	Options	Price
3-band parametric or HS/LS w/parametric mid band	MIDI clock w/SPP, MTC, SMPTE	24, 25, 29.97, 29.97d, 30, 30d	6	18-bit/64x	18-bit/8x	32, 44.1, 44.056, 48 kHz	Yes	2,048 GB	SCSI, SMPTE, MIDI, and RS422 interfaces; IB806B biphase; MT8 and DL16 remotes	(DR16) \$2,995 (DR16HD) \$3,395
3-band parametric or HS/LS w/parametric mid band	MIDI clock w/SPP, MTC, SMPTE	24, 25, 29.97, 29.97d, 30, 30d	6	24-bit/128x	20-bit/8x	32, 44.1, 44.056, 48 kHz	Yes	2,048 GB	SCSI, SMPTE, MIDI, and RS422 interfaces; ADAT, AES/EBU 8 channel I/O, EQ board	\$3,995
3-band parametric or HS/LS w/parametric mid band	MIDI clock w/SPP, MTC, SMPTE	24, 25, 29.97, 29.97d, 30, 30d	6	18-bit/64x	20-bit/8x	32, 44.1, 44.056, 48 kHz	Yes	2,048 GB	SCSI, SMPTE, MIDI, and RS422 interfaces; IB806B biphase; SuperView VGA/keyboard, MT8 and DL16 remotes	(DR8) \$1,995 (DR8HD) \$2,395
N/A	MTC, ADAT 9-pin SMPTE	24, 25, 29.97, 29.97d, 30, 30d	6	18-bit/128x	18-bit/64x	44.1, 48 kHz	Yes	4 GB	4-in exp. ADAT optional/9-panel, SMPTE sync, DSP cards, Jaz drive, OIC tape-backup drive	\$1,995 (w/4 GB fixed HD)
N/A	MTC (SMPTE optional)	24, 25, 29, 29d, 30, 30d	2	18-bit/64x	20-bit/128x	44.1, 48 kHz	Yes	8 GB	Balanced I/O, SMPTE interface	\$1,495 (w/2.55GB rem HD ins)t
N/A	MTC; (SMPTE optional)	24, 25; 29, 29d, 30, 30d	2	18-bit/64x	20-bit/128x	44.1, 48 kHz	Yes	8 GB	Balanced I/O; time code	\$2,195 (w/2.55GB rem HD ins)t
High/low shelving, mid parametric	MTC	24, 25, 30nd, 30d	1 (SCSI)	20-bit/64x	20-bit/8x	32, 44.1 kHz	Yes	8.2 GB	8051 punch-in footswitch	(w/o drive) \$599
2-band shelving, sweep mids	MTC	N/A	1	20-bit/64x	20-bit/128x	32, 44.1 kHz	Yes	8.2 GB	8051 punch-in footswitch; Converter-1 digital converter	\$899
N/A	N/A	N/A	0	16-bit	16-bit	8-48 kHz	No	520 MB	ISDN	\$3,650
High/low shelving (10 kHz, 100 Hz)	MIDI clock, MTC, MMC	30	0	18-bit	18-bit	44.1 kHz	Yes	4 GB	N/A	\$1,250
N/A	LTC, VITC, word clock	All frame rates	1	24-bit/64x	24-bit/64x	32, 44.056, 44.1, 47.952, 48 kHz	Yes	Unlimited	24-channel UFC-24 digital format converter	\$24,950
3-band	MTC; MMC; MIDI clock	24; 25, 29, 29d; 30	2	20-bit/64x	20-bit/128x	32, 44.1, 48 kHz	Yes	128 GB	CD recorder, VS8F-2 effects exp board; case; stand; video owners manual	\$3,195
3-band	MMC, MTC (master)	24; 25, 29, 29d; 30	0	20-bit/64x	20-bit/128x	32, 44.1 kHz	Optional	250 MB	VS-840BG bag, VS4S-1 SCSI exp kit, DR-20 mic (modeling)	\$1,395
3-band	MTC, MMC, MIDI clock	24, 25, 29, 29d; 30	1	20-bit/64x	20-bit/128x	32, 44.1, 48 kHz	Yes	32 GB	VS-CDR CD recorder, VS-880TC case, SI-80S MTC converter	\$2,195
N/A	Video; word clock; SMPTE, biphase; Sony 9 pin RS-422	24, 25, 29.97, 30, 30d	3	24-bit	24-bit	32, 44.1, 48, 96, 192 kHz	Yes	18 GB (FAT 32)	8 channels of AES/EBU; TDIF I/O	\$13,000
3-band, HS/LS, parametric mid	MIDI clock; MTC, (optional SMPTE)	24, 25, 29.97, 30, 30d	3	18-bit/128x	20-bit/128x	44.1 kHz	No	8 GB	Automated mixing software (PC and Mac)	\$2,495



# DIGITAL MIXDOWN MACHINES

Manufacturer	Model	Type	Sampling Frequency	Playback Frequency	ADC	DAC	Analog I/O	Digital I/O	Time Code	SCMS	Separate Mic Input	Write/Read Speed
Denon	DMD-1300P	MiniDisc	32, 44.1, 48 kHz	44.1 kHz	20-bit	20-bit	RCA	S/PDIF; Toslink	No	Yes	No	1x
Denon	DN-M1050R	MiniDisc	32, 44.1, 48 kHz	44.1 kHz	16-bit	18-bit	XLR, RCA	AES/EBU; S/PDIF (RCA)	Optional SMPTE kit (ACD-27MS)	Yes, defeatable	No	1x
Denon	DN-M2000R	MiniDisc	44.1 kHz	44.1 kHz	16-bit	18-bit	RCA	S/PDIF (RCA)	No	Yes, defeatable	No	1x
Denon	DN-M2300R	MiniDisc	44.1 kHz	44.1 kHz	16-bit	18-bit	XLR, RCA	AES/EBU; S/PDIF (RCA)	Optional SMPTE kit (ACD-27MS)	Yes, defeatable	No	1x
Fostex	CR-300	CD-R; CD-RW	32, 44.1, 48 kHz	44.1 kHz	N/A	N/A	RCA; XLR	AES/EBU; S/PDIF (optical)	No	N/A	N/A	N/A
Fostex	D5	DAT	32, 44.1, 48 kHz	44.1, 48 kHz	1-bit	1-bit	XLR	AES/EBU; S/PDIF (optical)	No	No	No	N/A
Fostex	D15	DAT	44.1, 48 kHz	44.1, 48 kHz	18-bit	18-bit	XLR	AES/EBU	Optional	No	No	N/A
Fostex	D25	DAT	44.1, 48 kHz	44.1, 48 kHz	18-bit	18-bit	XLR	AES/EBU	Yes (Sub Code)	No	No	N/A
Fostex	D30	DAT	44.1, 48 kHz	44.1, 48 kHz	18-bit	18-bit	XLR	AES/EBU	Yes (Sub Code Data)	No	No	N/A
HHB	CDR800	CD-R	32-48 kHz	44.1 kHz	16-bit	16-bit	XLR, RCA	AES/EBU; S/PDIF (optical/RCA)	No	Selectable 0, 1X, or unrestricted	No	Real-time
HHB	GENEX MO GX8000(A)	Magneto-optical recorder	44.1, 48, 88.2, 96 kHz	44.1, 48, 88.2, 96 kHz	16-20-bit	16-20-bit	XLR	25-pin D Sub	Yes	No	No	Variable
HHB	CDR 850	CD-R; CD-RW	32-48 kHz	44.1 kHz	16-bit	16-bit	RCA, XLR	AES/EBU; S/PDIF (optical)	Yes	Yes	Yes	Real-time
HHB	PDR1000 (TC, TC Plus)	Portable DAT recorder	32, 44.1, 48 kHz	32, 44.1, 48 kHz	16-bit	16-bit	XLR, RCA	AES/EBU; S/PDIF (RCA)	Optional	No	Yes (XLR)	Real-time or half-speed in LP mode
Marantz	PMD650	Portable	44.1 kHz	44.1 kHz	N/A	N/A	Mic/line; RCA	S/PDIF (coax); XLR	No	No	Yes (mic/line switchbl)	N/A
Marantz	Professional CDR620	CD-R	12-56 kHz	44.1 kHz	N/A	N/A	XLR	AES/EBU; S/PDIF (RCA)	No	No	No	1x (2x write, 4x read via SCSI)
Marantz	Professional CDR630	CD-R; CD-RW	12-56 kHz	44.1 kHz	N/A	N/A	XLR, RCA in; RCA out	S/PDIF (optical/RCA)	No	No	No	1x
Marantz	CDR640	CD-R; CD-RW	12-56 kHz	44.1 kHz	20-bit	N/A	XLR in/out; RCA out	AES/EBU; S/PDIF (coax)	No	Yes	No	N/A
Microboards	AudioWrite Pro	CD-R; CD-ROM	44.1 kHz	44.1 kHz	18-bit	N/A	RCA	N/A	No	No	No	1x (4x w/computer)/1
Microboards	Copywriter A20	CD-R; CD-ROM	44.1 kHz	44.1 kHz	18-bit	18-bit	RCA	N/A	No	No	Yes	4x/8x
Panasonic	SV-3800	DAT	32, 44.1, 48 kHz	32, 44.1, 48 kHz (auto)	18-bit	20-bit equivalent	XLR	AES/EBU; S/PDIF (optical/RCA)	No	Yes, defeatable	No	N/A
Panasonic	SV-4100	DAT	32, 44.1, 48 kHz	32, 44.1, 48 kHz (auto)	18-bit	20-bit equivalent	XLR	AES/EBU; S/PDIF (optical/RCA)	Yes (word clock sync)	Yes, defeatable	No	N/A
Pioneer Electronic	Elite PDR-99	CD-R	32, 44.1, 48 kHz	44.1 kHz	N/A	N/A	RCA	S/PDIF (optical/RCA)	No	Yes	No	1x
Pioneer Electronic	PDR-04	CD-R	44.1 kHz	44.1 kHz	N/A	N/A	RCA	S/PDIF (optical)	NoA	Yes	No	1x
Pioneer Electronic	PDR-05	CD-R	32, 44.1, 48 kHz	44.1 kHz	N/A	N/A	RCA	S/PDIF (RCA); Toslink (optical)	No	Yes	No	1x
Sony	MDS-DRE1	MiniDisc	44.1 kHz	44.1 kHz	20-bit/1-bit (ATRAC)	20-bit/1-bit (ATRAC)	RCA	Optical; coax	No	Yes	No	N/A
Sony	MDS-JE520	MiniDisc	44.1 kHz	Auto	20-bit	20-bit	RCA	S/PDIF (optical); 2-in, 1-out	No	Yes	No	N/A
Sony	MZR-55CG	Portable MiniDisc	44.1 kHz	Auto	16-bit (ATRAC)	16-bit (ATRAC)	1/8" mini	Optical/mini	No	Yes	1/8" mini stereo	N/A

SCSI Connection	Transport Disc Loading	Bundled Software	Disc-at-Once	Frequency Response	Signal-to-Noise Ratio	Total Harmonic Distortion	Special Features	Price
No	Motor-driven	No	No	4 Hz–20 kHz	>1 dB	0.02%	Includes wireless remote	\$799
No	Motor-driven	No	No	20 Hz–20 kHz	>92 dB	0.012%	External sync; hot-start option; RS232/422; standard PC hybrid cnctr	\$1999
No	Manual	No	No	20 Hz–20 kHz	>92 dB	0.02%	Hot starts; A-B loop; pitch $\pm 8\%$ ; jog/shuttle instruction start cue to music	\$999
No	Motor-driven	No	No	20 Hz–20 kHz	$\geq 92$ dB	$\leq 0.012\%$	External sync; hot-start optional; RS232/422; standard PC keyboard connector	\$1999
Yes	Stable platter mechanism	No	No	2 Hz–20 kHz	90 dB	0.003%	Data backup for all Fostex HD recorders	\$1,399
No	Tray	No	No	20 Hz–20 kHz	92 dB	N/A	Supplied infrared remote	\$1,029
No	Drawer	No	No	20 Hz–20 kHz	92 dB	0.05%	Parallel port; time code w/video reference; RS422 rack optional	(basic) \$3,195
No	Drawer	No	No	20 Hz–20 kHz	90 dB	0.05%	Supports audio channels and varispeed over RS422 port	\$7,995
No	Tray	No	No	20 Hz–20 kHz	92 dB	0.05%	LED screen; support audio channels/user presets	\$10,995
No	Stable platter mechanism (manual)	No	Yes	2 Hz–20 kHz	105 dB	0.003%		\$1,595
Yes	MO disc - (manual)	Yes	Yes	1 Hz–20 kHz	N/A	<-92 dB @ 0 dBfs; <-80dB @ -20 dBfs; <-44 dB @ -60 dBfs	GXR48 remote controller	\$9,565
No	Stable platter mechanism (manual)	No	Yes	20 Hz–20 kHz	109 dB	0.0022%	Adjustable auto stop delay; adjustable fade I/O	\$1,249
No	4-head/4-direct drive (manual)	No	Optional	20 Hz–22 kHz	90 dB	<0.015%	Time-code version; master sync module and headphone Matrix options	\$2,995 TC \$6,395 TC Plus \$6,995
No	Top-load (pocket type)	No	No	20 Hz–20 kHz	85 dB	0.05%	Sampling frequency converter; phantom power; audio buffer, dual mono recorder	\$1,399
Yes (SCSI-2)	Tray	No	Yes	20 Hz–20 kHz	95 dB (recording); 120 dB (playback)	N/A	Sampling-rate converter; DAT ID reader; wired remote control; audio delay; digital fader/cascade	\$3,600
No	Tray	No	Yes	20 Hz–20 kHz	90 dB (recording); 105 dB (playback)	N/A	Sampling-rate converter; 44.1 kHz SRC bypass; remote control; DAT ID reader	\$999
No	Tray	No	Yes	20 Hz–20 kHz	N/A	N/A	Frame accurate rec; pro and consumer formats; DSP control; auto stop; GPI port; CD sync	\$1,800 (remote \$200)
Yes	N/A	No	Yes	10 Hz–20 kHz	94 dB	N/A	4x direct interface accurate computer; 1x direct audio write; MP3 software incl for download from MP3 sites	\$649
Yes	N/A	No	No	20 Hz–20 kHz	N/A	N/A	Analog to digital; mic in	\$1,849
No	N/A	No	No	10 Hz–22 kHz (@ 48 kHz)	>92 dB	<0.007%	Remote control; optional hard-wired control	\$1,695
No	N/A	No	No	16 Hz–22 kHz	>92 dB	<0.007%	Remote control	\$2,650
No	Stable platter mechanism	No	No	2 Hz–20 kHz	92 dB (recording); 112 dB (playback)	0.004% (recording); 0.0026% (playback)	Sampling frequency converter allows direct recording from digital sources (48/32 kHz); Legato Link Conversion	\$2,000
No	Stable platter mechanism	No	No	2 Hz–20 kHz	92 dB (recording); 108 dB (playback)	0.005% (recording); 0.004% (playback)	Analog source auto level recording	\$1,185
No	Stable platter mechanism	No	No	2 Hz–20 kHz	92 dB (recording); 112 dB (playback)	0.004% (recording); 0.0026% (playback)	Sampling frequency converter allows direct recording from digital sources sampled at 48 kHz or 32 kHz	\$1,970
No	N/A	No	No	5 Hz–20 kHz ( $\pm 0.5$ dB)	96 dB	N/A	DJ-style speed/cue wheel back track rec; loop/reloop; patch speed controls; MD editing	\$1,200
No	N/A	No	No	5 Hz–20 kHz	>96 dB	N/A	Sampling frequency converter allows direct recording from digital sources (48/32 kHz)	\$360
No	N/A	No	No	15 Hz–20 kHz	>96 dB	N/A	Editing/song search; digital sampling rate converter; headphone/rmt; auto-lmlr	\$399



# DIGITAL MIXDOWN MACHINES

Manufacturer	Model	Type	Sampling Frequency	Playback Frequency	ADC	DAC	Analog I/O	Digital I/O	Time Code	SCMS	Separate Mic Input	Write/Read Speed
Sony	PCM-M1	DAT	32, 44.1, 48 kHz	Auto	16-bit	16-bit	1/8" stereo mini (mic/line)	7-pin (used w/optional cables)	No	No	Yes (1/8" stereo)	N/A
Sony	PCM-R300	DAT	32, 44.1, 48 kHz	Auto	20-bit	16-bit	RCA	S/PDIF (optical and RCA)	No	No	None	N/A
Sony	PCM-R500	DAT	32, 44.1, 48 kHz	Auto	20-bit	16-bit	XLR; RCA	AES/EBU; S/PDIF (RCA)	No	No	None	N/A
Sony	TCD-D8	DAT	32, 44.1, 48 kHz	Auto	16-bit	16-bit	1/8" stereo	7-pin connector (required optional cable)	No	Yes	Yes (1/8" stereo)	N/A
Sluder	D424	Magneto-optical recorder	44.056, 44.1, 47.952, 48 kHz	48 kHz	20-bit/64x	20-bit/128x	XLR	AES/EBU	Yes (SMPTE)	No	Yes	N/A
Tascam	DA-20 MKII	DAT	32, 44.1, 48 kHz	32, 44.1, 48 kHz	18-bit	18-bit	RCA	S/PDIF (RCA)	No	Yes, defeatable	No	N/A
Tascam	DA-40	DAT	44.1, 48, 32 kHz	44.1, 48, 32 kHz	18-bit	18-bit	XLR; RCA	AES/EBU; S/PDIF (RCA)	No	Yes, defeatable	No	N/A
Yamaha	MD4	MiniDisc	44.1 kHz	44.1 kHz	N/A	N/A	N/A	N/A	Yes (MTC)	No	Yes	N/A
Yamaha	MD8	MiniDisc	44.1 kHz	44.1 kHz	N/A	N/A	N/A	N/A	Yes (MTC)	No	Yes	N/A

## Plug In!

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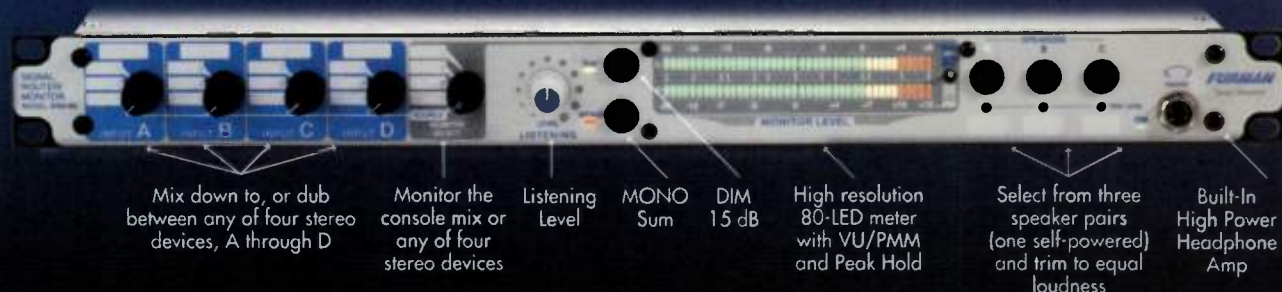


circle #140 on reader service card

SCSI Connection	Transport Disc Loading	Bundled Software	Disc-at-Once	Frequency Response	Signal-to-Noise Ratio	Total Harmonic Distortion	Special Features	Price
No	N/A	No	No	20 Hz-20 kHz	N/A	<0.008%	Adjustable level-sync; AGC/limiter circuit	\$995
No	N/A	No	No	20 Hz-20 kHz	>90 dB	<0.06%	20-bit A/D with super bit-mapping	\$995
No	N/A	No	No	20 Hz-20 kHz	>90 dB	<0.06%	20-bit A/D with super bit-mapping; 4 D.D. motor transport	\$1,695
No	N/A	No	No	20 Hz-20 kHz	>90 dB	<0.008%	High-speed search/cue; auto-limiter; backlit LCD	\$899
Yes (SCSI-2)	MO (Pioneer)	Yes (proprietary)	No (SADIE compat)	20 Hz-20 kHz	96 dB (16-bit); 108 dB (20-bit); 120 dB (24-bit)	N/A		\$8,950
No	Front	No	No	20 Hz-20 kHz	>92 dB	<0.05%		\$1,099
No	Front	No	No	20 Hz-20 kHz	>94 dB	<0.05%	User-selectable copy ID	\$1,599
No	N/A	No	No	20 Hz-20 kHz	85 dB	0.01%	Multitrack reader/cue list	\$849
No	N/A	No	No	20 Hz-20 kHz	96 dB	0.012%	Cut-and-paste editing	\$1,399

## SRM-80 SIGNAL ROUTER/MONITOR

# MONITORING, MIXDOWN, AND DUBBING HAVE NEVER BEEN THIS EASY...



Mix down to, or dub between any of four stereo devices, A through D

Monitor the console mix or any of four stereo devices

Listening Level

MONO Sum

DIM 15 dB

High resolution 80-LED meter with VU/PMM and Peak Hold

Select from three speaker pairs (one self-powered) and trim to equal loudness

Built-In High Power Headphone Amp

SRM-RU Remote

The new SRM-80 Signal Router/Monitor makes mixdown and dubbing simple, professional and affordable.

It provides signal routing and monitoring for four stereo devices (such as DAT, cassette, Mini Disc, CD-R, etc.) — plus the main console output. Multiple copies can all be made simultaneously. And that's only the beginning.

Monitor using three different speaker pairs, *at the same loudness*, using our exclusive "set-once" level trims. Speaker button "A" switches line-level for driving self-powered monitors; B and C use a high power relay to redirect your power amp output to either of the two pairs.

There's even a built in high power headphone amp.

A high resolution 80-LED meter for precise level calibration of all stereo devices. MONO Sum to check for mix problems, a DIM button to reduce listening levels during interruptions, and more. All five pushbutton functions are also available remotely on the optional SRM-RU, which includes a 10-foot cable.

## FURMAN

FURMAN SOUND, INC.

1997 South McDowell Blvd. • Petaluma, CA 94951

Tel: (707) 763-1010 • Fax: (707) 763-1310

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Contact us and we'll send you a free SRM-80 data sheet. Ask for our new color catalog too.



# SEQUENCERS (MIDI and Digital Audio)

Manufacturer	Product	Platform	Simultaneous MIDI Tracks	Maximum Clock Resolution (ppqm)	Quantization Types	Sequencing Method	Editing Views	Graphic Faders	SysEx Editing	Looping	# of Audio Tracks
Cakewalk	Guitar Studio	Win 95, 98	256	480	Swing (offline); percentage (offline); groove (offline)	Linear	Track/clip; console; audio; piano roll/controller; staff; event list; tempo; studio ware; SYSX; lyrics; markers; meter/key; video; Big Time	Yes	Yes	Yes	8
Cakewalk	Home Studio 8	Win 95, 98, NT	256	120	Swing (real-time, offline, input); percentage (real-time, offline, input)	Linear	Track/clip; console; audio; piano roll/controller; staff; event list; studio ware; SYSX; tempo; lyrics; markers; meter/key; video; Big Time	Yes	No	Yes	4
Cakewalk	Pro Audio 8	Win 95, 98, NT	256	480	Swing; percentage (real-time, offline, input); groove (offline)	Linear	Track/clip; console; audio; piano roll/controller; staff; event list; tempo; SYSX; lyrics; markers; meter/key; video; Big Time	Yes	Yes	Yes	128
Cakewalk	Professional 8	Win 95, 98, NT	256	480	Swing; percentage (real-time, offline, input); groove (offline)	Linear	Track/clip; console; audio; piano roll/controller; staff; event list; tempo; SYSX; lyrics; markers; video; Big Time	Yes	Yes	Yes	8
Cakewalk	Home Studio 5.0	Win 3.1, 95	256	480	Swing; percentage	Linear	Track/clip; audio; piano roll; controller; staff; event list; tempo; faders	Yes	No (playback only)	No	4
Cakewalk	Metro 4 with Notation	Mac	Unlimited	960	Swing; percentage; groove	Pattern based on linear	Track view; graphic editor; integrated audio/MIDI/velocity/controller/pitch; instrument (mixer); notation; QuickTime	Yes	Yes	Yes	64
Cakewalk	Pro Audio 6.0; Pro Audio 6.0 Deluxe	Win 95	256	480	Groove; swing; percentage; randomize; humanize	Linear; pattern	Track/clip; audio; effects; piano roll/controller; staff; StudioWare; event list; tempo; SysEx; CAL	Yes	Yes	Yes	Unlimited (hardware-dependent)
Cakewalk	Professional 5.0	Win 3.1, 95	256	480	Groove; swing; percentage; randomize; humanize	Linear	Track/clip; audio; piano roll/controller; staff; event list; tempo; SysEx; CAL; faders	Yes	Yes	Yes	4
Emagic	Logic Audio Discovery 3.0	Mac; Win 95, 98	Unlimited	960	Input; output; swing; groove	Linear; pattern	Piano roll; event list; notation; hyper edit/drum and controller edit	Yes	No	Yes	4-16 (hardware-dependent)
Emagic	Logic Audio Gold 3.1	Win 95, 98	Unlimited	960	Groove; swing; percentage; range; length; flam; velocity	Linear; folder	List; score; matrix (piano roll); hyper edit	Yes	Yes	Yes	Up to 64 (hardware-dependent)
Emagic	Logic Audio Gold 4.0	Mac	Unlimited	960	Groove; swing; percentage; range; length; flam; velocity	Linear; folder	List; score; matrix (piano roll); hyper edit	Yes	Yes	Yes	Up to 64 (hardware-dependent)
Emagic	Logic Audio Platinum 3.1	Mac	Unlimited	960	Groove; swing; percentage; range; length; flam; velocity	Linear; folder	List; score; matrix (piano roll); hyper edit	Yes	Yes	Yes	Up to 128 (hardware-dependent)
Emagic	Logic Audio Platinum 3.1	Win 95	Unlimited	960	Groove; swing; percentage; range; length; flam; velocity	Linear; folder	List; score; matrix (piano roll); hyper edit	Yes	Yes	Yes	96 (hardware-dependent)
Emagic	Logic Audio Silver 3.1	Mac	Unlimited	960	Groove; swing; percentage; range; length; flam; velocity	Linear; folder	List; score; matrix (piano roll); hyper edit	Yes	Yes	Yes	24 (hardware-dependent)
Emagic	Logic Audio Silver 3.1	Win 95, 98	Unlimited	960	Groove; swing; percentage; range; length; flam; velocity	Linear; folder	List; score; matrix (piano roll); hyper edit	Yes	Yes	Yes	24 (hardware-dependent)
Emagic	MicroLogic AV	Mac	Unlimited	960	Normal; swing	Linear	List; score; matrix (piano roll)	Yes	No	Yes	16 (hardware-dependent)

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	Price
Yes	32-bit, real-time stereo effects (reverb, chorus, delay/echo, flanger, parametric EQ)	No	Yes	N/A	No	DirectX	No	No	Supports RealMedia; Vector fretboard; MIDI guitar glitch filter; MIDI effects; Roland GR-30 control panel; StudioWare, SMPTE/MTC	\$249
Yes	32-bit, real-time stereo reverb, chorus	No	No	Basic	No	DirectX	No	No	Supports AVI, MPEG, QuickTime, RealMedia; Vector automation; MIDI effects; StudioWare, key bindings	\$129
Yes	32-bit, real-time stereo effects (reverb, chorus, delay/echo, flanger, parametric EQ)	No	Yes	Formant - preserving	Yes	DirectX	Yes	Yes	Supports 24-bit/96 kHz, AVI, MPEG, QuickTime, RealMedia, Digi Session 8, Yamaha DS2416, Soundscape SSHDR1, DAL Session 8, StudioWare, SMPTE/MTC sync	\$429 (Deluxe) \$529
Yes	32-bit, real-time stereo effects (reverb, chorus, delay/echo, flanger, parametric EQ)	No	Yes	Basic	Yes	DirectX	No	No	Supports AVI, MPEG, QuickTime, RealMedia, SMPTE/MTC sync, Vector automation; MIDI effects; notation; StudioWare; CAL; key bindings	\$279
Yes	Graphic EQ, reverse, normalize, 3 dB boost/cut	No	No	MIDI	Yes	N/A	No	No	Notation printing; plays back MCI commands; on-screen tutorials	\$129
Yes	Real-time, stereo (parametric EQ, chorus, flanger, delay, reverb, tremolo)	No	No	Bias SFX	No	VST, Premiere	No	No	Rhythm Explorer, Note Spray, supports QuickTime, OMS, SMPTE/MTC, Korg 1212 I/O, AudioMedia III, Sonorus Studi/O; BIS SFX Lite	\$249
Yes	Reverb, delay/eh, chorus, flanger, parametric EQ, graphic EQ, reverse, normalize, 3 dB boost/cut	No	Yes	Formant-preserving, traditional	Yes	DirectX Media	Yes	Yes		\$429 (Deluxe) \$529
Yes	Graphic EQ, reverse, normalize, 3 dB boost/cut	No	No	MIDI	Yes	N/A	No	No	Notation printing; audio/MIDI sync to SMPTE/MTC; CAL; key macros; SysEx librarian; plays back MCI commands; onscreen tutorials	\$249
Yes	N/A	No	Yes	Traditional	No	N/A	No	No	Load Logic/Logic Audio files; import Logic/Logic Audio Environ templates (SysEx mixers, etc.); virtual studio, screen sets	\$299
Yes	23 native plug-ins	Yes	Yes	Formant-preserving, traditional	Yes	DirectX, EASI	Yes	Yes	Supports Audiowerk8, DAE, Korg 1212, CBX, AV, Akai DR8/16, crosslades; 90 screen sets; real-time non-destructive MIDI editing	\$499
Yes	23 native plug-ins	Yes	Yes	Formant-preserving, traditional	Yes	VST, Premiere, AudioSuite, EASI	Yes	Yes	Supports full TDM, Audiowerk8, DAE, Korg 1212, CBX, AV, Akai DR8/16, crosslades; 90 screen sets; real-time non-destructive MIDI editing	\$499
Yes	31 native plug-ins	Yes	Yes	Formant-preserving, traditional	Yes	VST, Premiere, AudioSuite, EASI	Yes	Yes	Supports full TDM, Audiowerk8, DAE, Korg 1212, CBX, AV, Akai DR8/16, 24-bit/96kHz; crosslades; 90 screen sets; 500 key/MIDI commands; real-time non-destructive MIDI editing	\$799
Yes	31 native plug-ins	Yes	Yes	Formant-preserving, traditional	Yes	DirectX, EASI	Yes	Yes	Supports SSHDR-1, Audiowerk8, DAE (AudioMedia III), MME, 24-bit/96 kHz; crosslades; 90 MIDI commands; real-time MIDI editing	\$799
Yes	14 native plug-ins	Yes	Yes	Formant-preserving, traditional	Yes	N/A	No	No	Supports Audiowerk8, AV, DAE; 90 screen sets; 500 key/MIDI commands; real-time MIDI editing	\$299
Yes	14 native plug-ins	Yes	Yes	Formant-preserving, traditional	Yes	N/A	No	No	Supports Audiowerk8, MME, DAE (AudioMedia III); 90 screen sets; 500 key/MIDI commands; real-time MIDI editing	\$299
Yes	Reverb, delay, shelf EQ, fixed frequency shelving EQ	Yes	No	N/A	Yes	N/A	No	No	Real-time sequence edit, Mac AV support	\$99



# SEQUENCERS [MIDI and Digital Audio]

Manufacturer	Product	Platform	Simultaneous MIDI Tracks	Maximum Clock Resolution (ppqn)	Quantization Types	Sequencing Method	Editing Views	Graphic Faders	SysEx Editing	Looping	# of Audio Tracks
Emagic	MicroLogic AV	Win 95, 98	Unlimited	960	Normal; swing	Linear	List; score; matrix (piano roll)	Yes	No	Yes	16 (hardware-dependent)
Mark of the Unicorn	Digital Performer 2.6	Mac	Unlimited	480	Input; output; swing; groove; humanize; Groove Editor	Linear; pattern	Track overview; graphic; event list; notation; multitrack audio waveform	Yes	Yes	Yes	Max allowed by ProTools Project, ProTools III/TDM, ProTools 24/Mix Plus; native MAS track count hardware dependent (up to 72 on 400 MHz G3)
Mark of the Unicorn	FreeStyle 2.0	Mac, Win 3.1, 95	Trackless (players/takes; dynamic MIDI channel allocation)	960	Straight; offset	Linear; loop; arrange window	Piano roll; notation	No	No	Yes	0
Mark of the Unicorn	Performer 6	Mac	Unlimited	480	Input; output; swing; groove; humanize; Groove Editor	Linear; pattern; chunk	Graphic; event list; notation	Yes	Yes	Yes	Up to 8 on PowerPC Mac
Midisoft	Studio Recording Session 1.0	Win 95	Unlimited	1,000	Percentage	Linear	Notation; MIDI list	Yes	Yes	No	8
Musicator	Musicator Win 3.0	Win 3.1, 95	255	480	Swing; percentage	Linear	Track; passage; bar; roll view; notation; audio; effects; event list; GS/XG	Yes	Yes	Yes	32
Opcodes	Musicshop 2.0	Mac, Win 3.1, 95	32	480	Playback or destructive; grid	Linear; pattern	Piano roll; notation	Yes	Yes	Yes	0
Opcodes	Studio Vision Pro 4.2.1	Mac	Unlimited	480	Playback only or destructive; grid; groove; swing	Linear; pattern	Piano roll; list edit; notation; overview; pulse edit	Yes	Yes	Yes	Up to 128 (hardware-dependent)
Opcodes	Vision 2.5	Win 3.1, 95	Unlimited	480	Playback only or destructive; grid; groove; swing	Linear; pattern	Piano roll; list edit; notation; overview	Yes	Yes	Yes	0
Opcodes	Vision DSP 4.2.1	Mac	Unlimited	480	Playback only or destructive; grid; groove; swing	Linear; pattern	Piano roll; list edit; notation; overview	Yes	Yes	Yes	Up to 128 (hardware-dependent)
Passport Designs	Master Tracks Pro	Win 3.1, 95; Mac	64	960 (Win); 240 (Mac)	Swing; percentage	Linear	Track/clip; piano roll; controller; staff; song play list	No	Yes	Yes	0
Personal Composer	Personal Composer 1.5	Win 3.1, 95; 98, NT	16	1024	Input	Linear	Notation	Yes	No	No	0
PG Music	Band-In-A-Box	Win 3.1, 95; 98, NT; Mac 6.07 and higher	12	120	Swing; percentage; randomize	User-entered chord prog and style sel	Chord; staff/staff roll notation; style edit; Style Maker; MIDI channels; soloist editor/maker; harmonies; leadsheet	No	Yes	Yes	0
PG Music	PowerTracks Pro Audio 5.0	Win 3.1, 95; 98, NT	48	960	Swing; percentage; randomize	Linear; step	Track; audio; mixer; events; bars; staff roll notation; SysEx editor; tempo/meter maps; Sound Canvas editor; leadsheet (full screen) notation window	Yes	Yes	Yes	Up to 48 (hardware-dependent)
Roland	MC-303 Groovebox	Hardware	8 (16 in Sound Module mode)	96	Grid; groove; shuffle	Pattern	N/A	No	Yes	Yes	0
Roland	MC-505 Groovebox	Hardware	8 + mute control track	96	Grid; groove; shuffle	Pattern	N/A	No	Yes	Yes	0

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	Price
Yes	Reverb, delay, fixed frequency shelving EQ	Yes	No	N/A	Yes	N/A	No	No	Real-time sequencedit, MME sound card support	\$99
Yes	e-Verb, PreAmp-1, Sonic Modulator, auto-pan, chorus, echo, flanger, phase shifter, reverb parametric EQ, limiter, multiband compressor	Yes	Yes	Pure DSP for mono, conventional for polyphonic in mono and stereo	Yes	TDM, MAS, Premiere	No	No	Automation for MAS/TDM plug-ins, MIDI control/sidechain control of MAS plug-ins, 24-bit Waveform Editor, Supports QuickTime, ProTools 24/Mix Plus, MOTU Audio 2408, Unisyn	\$795
No	N/A	No	No	N/A	No	N/A	No	No	Sense Tempo, note-spelling algorithms, edit notes during sequence playback, groove metronomes	\$199
Yes	EQ, dynamics, chorus, flanger, delay, phase shifter, auto-pan, echo, tremolo	Yes	No	N/A	No	MAS	No	No	QuickTime support, Unisyn, custom consoles for Roland VS-880, window sets, WYSIWYG notation editing	\$495
No	Delay, echo, chorus, flanger, EQ	Yes	No	Traditional	Yes	N/A	No	No	Multisequence playback, articulation marks on score on playback, publisher-quality notation	\$149.95
Yes	N/A	No	No	N/A	Yes	N/A	No	No	Pro-quality notation, front-panel controls for GS, XG, SC-88 PRO effects, long file names w/Win 95	\$299
No	N/A	No	No	N/A	No	N/A	No	No	Includes 100 MIDI clips	\$99.95
Yes	EQ, normalize, phase invert	Yes	Yes	Formant-preserving, traditional	Yes	Premiere, TDM, VST	Yes	No	Quickpunch for TDM, real-time VST effects, MIDI arpeggiator, generated sequences	\$995
No	N/A	No	No	N/A	No	N/A	No	No	Generated sequences, sequence trigger from MIDI in real-time (players/queue mode)	\$299.95
No	EQ, normalize, phase invert, reverse	Yes	No	N/A	Yes	Premiere, VST	No	No	Real-time audio effects, MIDI arpeggiation, generated sequences	\$495
No	N/A	No	No	N/A	No	N/A	No	No	SMPTE, SysEx librarian, master ladder, MCI- (WIN) event, song play list, graphical editing, tempo map	\$99.99
No	N/A	No	No	Traditional	No	N/A	No	No	Transposing	\$69-\$199
No	N/A	No	No	N/A	No	N/A	No	No	Automatic soloing and songwriting, international language	(Pro) \$83 (MegaPak) \$249
Yes	Compressor, gate, dist, reverb, echo, chorus, flanger, ring modulator, tremolo, tone, graphic/parametric EQ, De-Esser, auto-wah, pitch shift, exciter, enhancer	Yes	No	N/A	Yes	Proprietary (developer kit provided)	No	No	Supports MID, KAR, WAV, MP3, any Win format, international language, large window for "big lyrics" display, guitar tuner, PowerPak including Vol 1 of MultiTracks display CDs	\$29 (PowerPak) \$49
No	Reverb, delay, chorus, flanger	No	No	N/A	No	N/A	No	No	Arpeggiator, RPS, low boost	\$895
No	Reverb, delay, EFX (24 types)	No	No	Traditional	No	N/A	No	No	Interactive, D-Beam, infrared-light sensing controller, Megamix, arpeggiator, RPS, low boost	\$1,495



# SEQUENCERS [MIDI and Digital Audio]

Manufacturer	Product	Platform	Simultaneous MIDI Tracks	Maximum Clock Resolution (ppqn)	Quantization Types	Sequencing Method	Editing Views	Graphic Faders	SysEx Editing	Looping	# of Audio Tracks
Roland	MC-50mkII	Roland S-MRC	8 (32 channel)	96	Grid	Step/real, pattern/linear	Track, event	No	Yes	Yes (playback only)	0
Roland	MC-80	Roland MRC-Pro	16 (32 channel)	480	Grid, groove, shuffle	Step/real, pattern/linear	Track, event	No	Yes	Yes	0
Sion	QuickScore Elite Level II 8.0	Win 3.1, 95, 98, NT	48	960	8th-64th note, humanize	Linear	Notation editor, piano roll editor, event list, mixer, track sheet, song editor	Yes	No	Yes	48 (hardware-dependent)
Steinberg	Cubase Score VST 3.6	Win 95	Unlimited	384	Over, note on, interactive, analytic, freeze editable, groove	Linear	Key, list, score, drum, logical	Yes	Yes	Yes	64
Steinberg	Cubase Score VST 4.0	Mac	Unlimited	1,920	Over, note on, interactive, analytic, freeze editable, groove	Linear	Key, list, score, drum, logical, controller	Yes	Yes	Yes	64
Steinberg	Cubase VST 3.6	Win 95, 98	Unlimited	384	Over, note on, interactive, analytic, freeze editable, groove	Linear	Key, list, score, drum, logical	Yes	Yes	Yes	64
Steinberg	Cubase VST 4.0	Mac	Unlimited	1,920	Over, note on, interactive, analytic, freeze editable, groove	Linear	Key, list, score, drum, logical, controller	Yes	Yes	Yes	64
Steinberg	Cubase VST/24 3.6	Win 95, 98	Unlimited	384	Over, note on, interactive, analytic, freeze editable, groove	Linear	Key, list, score, drum, logical	Yes	Yes	Yes	Up to 96
Steinberg	Cubase VST/24 4.0	Mac	Unlimited	1,920	Over, note on, interactive, analytic, freeze editable, groove	Linear	Key, list, score, drum, logical, controller	Yes	Yes	Yes	Up to 96
Steinberg	Cubase AV	Mac	64 (x16)	384	Program auto	Linear	Key, list, score	Yes	No	Yes	8
Steinberg	Cubase AV	Win 3.1, 95, 98	64 (x16)	384	Program auto	Linear	Key, list, score	Yes	No	Yes	8
Voyetra	Computer Music Starter Kit	Win 3.1, 95, 98, NT	1000+ (system dep)	N/A	Supported	Real time, step	Piano roll, notation, track view	Yes	No	Yes	0
Voyetra	Digital Orchestrator Pro	Win 3.1, 95, NT 4.0	Unlimited	1,920	Adjust intensity, sensitivity, offset, inside/outside range	Linear	Graphic controller editor, MIDI mixer, multitrack, notation, conductor	Yes	Yes	Yes	Unlimited (hardware-dependent)
Wildcat Canyon	Autoscore 2.0 Mac Deluxe	Mac	16	480	Notation display, command, cursor, duration	Linear, pattern	Track, faders, piano roll, score	Yes	Yes	Yes	0
Wildcat Canyon	Autoscore 2.0 Mac Pro	Mac	16	480	Notation display, command, cursor, duration	Linear, pattern	Track, faders, piano roll, score	Yes	Yes	Yes	0
Wildcat Canyon	Autoscore 2.0 Win Deluxe	Win 3.1, 95	Unlimited	384	Percentage, notation	Linear, pattern	MIDI list, mixer, piano roll, score, studio panel	Yes	No	Yes	1
Wildcat Canyon	Autoscore 2.0 Win Pro	Win 3.1, 95	256	480	Percentage, starting time, duration	Linear, pattern	Track/measure, staff, piano roll, event list, controller, faders	Yes	No	Yes	0
WinJammer	Professional Version 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	0

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	Price
No	N/A	No	No	N/A	No	N/A	No	No	2 MIDI outs	\$795
No	N/A	No	No	N/A	No	N/A	No	No	Direct from disk playback, exp arpeggiator; RPS, music-1; real-time mark/jump buttons; programmable fade, 2 FSs; options include: VE-GSPvoice exp, internal Zip 100 drv, 2.5" GB hard drive, SCSI	\$1,295
No	N/A	No	Yes	Shift-in key; transpose	No	N/A	No	No	Supports Windows digital video formats, playback of repeats, exports to TIFF, BMP, EPS, dynamic marking/ornaments	\$179.95
Yes	Reverse, pitch shift, EQ, varispeed, chorus, delay, reverb, pan, fuzz	Yes	Yes	Traditional	Yes	VST, Direct X	No	Yes	Studio Module, Cue Trax, Wavelab Lite, arpeggiator, CD player, AVI monitor, real-time MIDI, Style Trax, interactive phrase synth, open arch plug-in interface; import recycle REX files, pro scoring	\$549
Yes	4-band EQ, reverb, chorus, delay, pan, fuzz, spatial	Yes	Yes	Traditional	Yes	VST	No	Yes	Open-architecture plug-in interface; var mixdown filters for rate, bit, and file format, Style Trax, Cue Trax, QuickTime, pro scoring, import recycle REX files	\$549
Yes	Reverse, pitch shift, EQ, varispeed, chorus, delay, reverb, pan, fuzz	Yes	Yes	Traditional	Yes	VST, Direct X	No	Yes	Studio Module, Cue Trax, Wavelab Lite, arpeggiator; CD player; AVI monitor, real-time MIDI, Style Trax, interactive phrase synth, import recycle REX files	\$399
Yes	4-band EQ, reverb, chorus, delay, pan, fuzz, spatial	Yes	Yes	Traditional	Yes	N/A	No	Yes	Open-arch plug-in interface w/real-time effects, Style Trax, Cue Trax, QuickTime, import recycle REX files	\$399
Yes	Reverse, pitch shift, EQ, varispeed, chorus, delay, reverb, pan, fuzz	Yes	Yes	Traditional	Yes	VST, DirectX	No	Yes	Studio Module, Cue Trax, arpeggiator, CD player, AVI monitor; real-time MIDI pcrsr, Style Trax, interactive phrase synth, up to 24-bit/96K rec; supports Yamaha DSP Factory, Lexicon Studio	\$799
Yes	4-band EQ, reverb, chorus, delay, pan, fuzz, spatial	Yes	Yes	Formant-preserving; traditional	Yes	VST	No	Yes	Open-architecture plug-in interface; mixdown features for rate, bit, and file format; Up to 24-bit/96K audio rec; Import relink REX files	\$799
No	2-band EQ, reverb, delay	No	No	N/A	No	N/A	No	No	QuickTime; MIDI clock send/receive, 30 staves of notation; recs SysEx	\$99
No	N/A	No	No	N/A	No	N/A	No	No	MIDI clock send/receive; records SysEx	\$99
No	N/A	Yes	No	N/A	No	N/A	No	No	MIDI Orchestrator Plus (MIDI ver of Digital Orchestrator), multimedia course on MIDO, music synthesis (\$29.95 dwnld vers, MIDI Orchestrator only)	\$79.95
Yes	EQ, delay	Yes	Yes	Traditional	Yes	N/A	No	No	Mixdown: expert to any ACM-compat format, expert to any avail codes	\$199
No	N/A	No	No	N/A	No	N/A	Yes	Yes	Real-time pitch-to-MIDI for non-keyboard players; pitch, volume, staff meters, key-constrain mode, mic	\$119
No	N/A	No	No	N/A	No	N/A	Yes	Yes	Real-time pitch-to-MIDI for non-keyboard players; pitch, volume, staff meters, key-constrain mode, mic	\$249
No	N/A	No	No	N/A	No	N/A	Yes	Yes	Real-time pitch-to-MIDI for non-keyboard players; pitch, volume, staff meters, key-constrain mode, mic	\$119
No	N/A	No	No	N/A	No	N/A	Yes	Yes	Real-time pitch-to-MIDI for non-keyboard players; pitch, vol, staff meters, key-constrain, mic, instrument filters	\$249
No	N/A	No	No	N/A	No	N/A	No	No		\$199.95



# ANALOG MIXING CONSOLES

Manufacturer	Product	Mixer Configuration	Mic Inputs (XLR)/Line Inputs	# of Inserts/Direct Outs	# of Aux Sends/Returns/Type	# of Bus Outputs/Type	EQ	Mute	Solo-In-Place	Frequency Response
Alesis	Studio 12R	14x2	8/14	8/0	2/1 $\frac{1}{2}$ TRS	N/A	High/low shelving	No	No	20 Hz–50 kHz, $\pm 0.5$ dB
Alesis	Studio 24	16x4x2, 12x2	8/28	8/8	4/2 $\frac{1}{2}$ TRS	1 $\frac{1}{2}$	High/low shelving, mid band parametric	Yes	Yes	20 Hz–50 kHz, $\pm 0.5$ dB
Alesis	Studio 32	16x4x2, 40x2	16/40	16/16	6/4 $\frac{1}{2}$ TRS	4 $\frac{1}{2}$ TRS	High/low shelving, mid band parametric	Yes	Yes	20 Hz–50 kHz, $\pm 0.5$ dB
Allen & Heath	GS 3000	24 or 32x8x2	24 or 32	N/A	6+2/dual stereo channels	8	4-band	Yes	Yes	20 Hz–20 kHz, $\pm 0.5$ dB
Carvin	C800	8x2x1	8/8	8/8	5/4 $\frac{1}{2}$	(3) XLR (3) $\frac{1}{4}$ , (2) RCA	3-band w/mid & lo-cut buttons	Yes	No	20 Hz–20 kHz
Carvin	Studiomate	16x2	8/16	8/8	2/2 $\frac{1}{2}$	(2) $\frac{1}{4}$ , (2) RCA	3-band (per channel)	No	No	20 Hz–20 kHz
D&R	Orion X	30x16x2	16	2/1 (per channel)	8/8	16 (balanced)	Bands in the mon path	Yes	Yes	20 Hz–120 kHz, $\pm 0.5$ dB
D&R	Vision 32	32x8x2	32	1/1 (per channel)	8/8 (balanced)	8 bus/+4 to -10 dBv	4-band	Yes	Yes	20 Hz–120 kHz, $\pm 0.5$ dB
D&R	Vision 8	8x4x2	8	1/1 (per channel)	4/4 (balanced)	8 bus/+4 to -10 dBv	3-band	Yes	N/A	20 Hz–120 kHz, $\pm 0.5$ dB
Empirical Labs	MA200	14x2	6/8	6/4	3/2	4/ $\frac{1}{2}$	3-band	Yes	Yes	20 Hz–20 kHz
Empirical Labs	MA400	14x2	6/8	6/4	3/2	4/ $\frac{1}{2}$	3-band	Yes	Yes	20 Hz–20 kHz
Mackie Designs	16 8, 24 8, 32 8	16/24/32x8x2	16/24/32	16/24/32	6 mono/6 stereo	24/ $\frac{1}{2}$	4-band, low-cut filter	Yes	Yes	20 Hz–60 kHz, $\pm 0$ dB/-1 dB
Miles Technology	MTX-62 MultiMixer	6x2	6/6	2/2	0	2/XLR	2-band	No	No	20 Hz–20 kHz, $\pm 0$ /-1 dB
Millennia Media	Mixing Suite	4x2 to 80x4x4 (modular)	Variable	Variable	4/4	4	HPF (20 Hz–20 kHz)	Yes	Yes	1 Hz–500 kHz, $\pm 4$ dB
Oram Pro	Octamix	8x2x1	0/8	N/A	N/A	2 (stereo or quad)/XLR	N/A	No	No	18 Hz–3 kHz
Peavey	RQ 3014	10x2	6/4	6/6	3/2	2	2-band, mid sweep	Yes	Yes	20 Hz–20 kHz, $\pm 0$ /-3 dB
Peavey	Unity 1002-8 RQ	8x2	8	0/0	2/0	2	3-band	No	No	20 Hz–20 kHz, $\pm 0$ /-3 dB
Peavey	Unity 2002-12 RQ	12x2	12	0/0	4/0	2	3-band	No	No	20 Hz–20 kHz, $\pm 0$ /-3 dB
Speck	XTRAMIX-204	20x4x2	0/32	Inserts on 4 bus/stereo outs	4/4 (stereo)	4/TRS	N/A	No	Yes	4 Hz–154 kHz
Speck	XTRAMIXcx1	40x8x2	0/76	Inserts on 8 bus/stereo outs	4/4 (stereo)	4/TRS	N/A	No	Yes	4 Hz–154 kHz
Spirit	Folio FX16	16x2x2	16/16	16/16	3/ $\frac{1}{2}$	4/ $\frac{1}{2}$	3-band, mid sweep	Yes	Yes (PFL)	20 Hz–30 kHz
Spirit	Folio FX8	16x2x2	8/16	8/8	3/ $\frac{1}{2}$	4/ $\frac{1}{2}$	3-band, mid sweep	Yes	Yes (PFL)	20 Hz–20 kHz
Spirit	Folio Notepad	8x2	4/8	0/0	1/ $\frac{1}{2}$	N/A	2-band, fixed	No	No	20 Hz–20 kHz
Spirit	Folio Powerpad	8x2	4/8	0/0	1/ $\frac{1}{2}$	N/A	2-band, fixed	No	No	20 Hz–20 kHz
Spirit	Folio SX	12x2x2	16/20	12/8	3/ $\frac{1}{2}$	4/ $\frac{1}{2}$	3-band, mid sweep	Yes	Yes (SIP/PFL)	20 Hz–30 kHz
Spirit	LX 7/16	16x4x2x1	16/16	16/16	6/ $\frac{1}{2}$	7/ $\frac{1}{2}$	4-band, 2 mid sweep	Yes	Yes (SIP/PFL)	20 Hz–20 kHz
Spirit	LX 7/24	24x4x2x1	24/24	24/24	6/ $\frac{1}{2}$	7/ $\frac{1}{2}$	4-band, 2 mid sweep	Yes	Yes (SIP/PFL)	20 Hz–20 kHz
Summit Audio	TMX-420	4x2	4/4	16	4/4 $\frac{1}{2}$	4/ $\frac{1}{2}$	No	Yes	Yes	5 Hz–55 kHz
Yamaha	MX 12/4	12x4x2	8/2	4/0	(2) $\frac{1}{2}$	(4) $\frac{1}{2}$ , (2) XLR stereo	3-band	No	No	20 Hz–20 kHz, $\pm 1$ dB, $\pm 2$ dB @ $\pm 4$ dB

Signal-to-Noise Ratio	Total Harmonic Distortion	Dynamic Range	Channel Crosstalk (@ 1 kHz)	Phantom Power	Talkback/Onboard Oscillator	Dedicated 2 Track Returns	Special Features	Dimensions	Price
90 dB	<0.005%	108 dB	>85 dB	Global	No/No	Yes	Rackmount, 60 mm feeders, headphone/control room outputs	19x6x5.25	\$449
90 dB	<0.0025%	108 dB	>80 dB	Global	No/No	Yes	Inline monitor section w/FX; full-featured control room section; hybrid/discrete mic presets	15x17x4.25	\$799
90 dB	<0.0025% to out	108 dB	>80 dB	Global	No/No	Yes	Inline monitor section w/FX; full-featured control room section; hybrid/discrete mic presets	17.5x16.5x6	\$1,149
N/A	0.006%	N/A	≤100 dB per channel	Yes per channel	Yes/Yes	Yes (3)	2 patchable value presets in master section (mic/line or instrument)	N/A	(24) \$5,995 (32) \$6,995
90 dB	<0.009%	104 dB	N/A	Yes	No/No	Yes	24-bit digital FX, 16 presets; (2) 9-band graphic EQs	14x14.5x3.5	\$499.95
90 dB	<0.01%	104 dB	N/A	Yes	No/No	Yes	Low-noise toroid transformer	16x12x3	\$299.95
N/A	0.015%	+26 dBu	105 dB	Yes	Yes/Yes	Yes	Power dynamics (limiter/gate/compressor available), power VCA automation, optional on-board patch bay	61x37	\$16,967
N/A	0.015%	Headroom >22 dB, max +26 dBu	>90 dB	Yes	Yes/Yes	Yes	Includes additional 4 stereo modules and matrix master	62x30x9	\$16,571
N/A	0.015%	Headroom >22 dB, max output +26 dBu	>90 dB	Per channel	Yes/Yes	Yes	Fully modular, optional meter bridge	19" frame (can be rack-mounted)	\$3,748
>92 dB	<0.03%	>90 dB	>60 dBc	6 channels	No/No	Yes	Reverb, delay, notebook-style chassis	N/A	\$999
>92 dB	<0.03%	>90 dB	>60 dBc	6 channels	No/No	Yes	Reverb, delay, notebook-style chassis	N/A	\$849
90 dBu	0.0014%	114 dBu	-91 dBu	Yes	Yes/No	Yes	Inline monitoring	(16) 28.74x29.17x6.54 (24) 28.74x37.02x6.54 (32) 28.74x45.82x6.54	(16) \$2,719 (24) \$3,399 (32) \$4,249
90 dB	0.03%	110 dB	60 dB	Per channel	No/No	No	XLR/1/4" combination ins, channel level indicators, output insert/sounds, crossovers, sub out	19x10x1.75	\$699
≥100 dB	0.002%	120 dB	≥100 dB	Yes	Yes/Yes	Yes (2)	N/A	4 rackspace	\$15,000
N/A	>0.005%	N/A	N/A	No	N/A	No	Pan, 2 stereo XLR mix outputs, headphone cue	1 rackspace	\$1,295
N/A	<0.01%	110 dB	90 dB	Yes	No/No	Yes	"Super Channel"	15x16x4.3	\$549.99
N/A	<0.01%	110 dB	90 dB	Yes	No/No	Yes	N/A	17x16x3.2	\$399.99
N/A	<0.01%	110 dB	90 dB	Yes	No/No	Yes	N/A	23x16x3.2	\$499.99
-92 dB	<0.0032%	N/A	-82 dB	No	Yes/No	Yes	Ultra compact 4-bus receiver mixer	2 rackspace	\$1,490
-92 dB	<0.0032%	N/A	-82 dB	No	Yes/No	Yes (2)	Ultra compact 8-bus receiver mixer, expander to 148 inputs	4 rackspace	\$2,990
N/A	<0.009%	N/A	>96 dB	Global	No/No	Yes	Lexicon FX, rotatable patch bay	17.5x18x6.3	\$1,199.95
N/A	<0.009%	N/A	>96 dB	Global	No/No	Yes	Lexicon FX	17.5x16.5x4.1	\$699.95
N/A	<0.005%	N/A	>90 dB	Global	No/No	Yes	Optional mic stand adapter	8.7x9.6x2	\$299.95
N/A	<0.005%	N/A	>90 dB	Global	No/No	Yes	30Wx2 built-in power amp	9.8x9.3x4	\$399.95
N/A	<0.006%	N/A	>95 dB	Global	No/No	Yes	100 mm ladders	19x20x2.8	\$849.95
N/A	<0.006%	N/A	>95 dB	Global	Yes/No	Yes	Left, right, and mono outputs	19.5x26x7	\$1,599.95
N/A	<0.006%	N/A	>95 dB	Global	Yes/No	Yes	Left, right, and mono outputs	19.5x34x7	\$1,999.95
>90 dB	-0.2%	>90 dB	N/A	No	No/No	No	Tube	19x14x3.5	\$3,695
-128 dB in, -noise; 95 dB out noise	<0.1% @ +14 dB	N/A	70 dB	Yes	No/No	Yes	Onboard digital FX	3.25x15.75x17.125	\$599.95



# DIGITAL MIXING CONSOLES

Manufacturer	Product	Mixer Configuration	Mic Inputs (XLR)/Line Inputs	# of Digital Inputs/Type	# of Digital Outputs/Type	# of Option Card Slots	Analog Inserts/Direct Outs	# of Analog Aux Sends/Returns	AD Converters	DA Converters	EQ Type	# of Dynamic Processors
Generalmusic	IFM Falcon	12x4x2	6/4	1 AES/EBU or S/PDIF (XLR); others optional	1 AES/EBU or S/PDIF (coaxial); others optional		0/0	2/2	20-bit/64x	20-bit/64x	3-band parametric	12
Mackie Designs	Digital 8-Bus	56x8x2	12/44	Up to 32 w/optional cards	Up to 34 w/optional cards/ADAT, TDIF or AES/EBU	4 I/O, effects	12/up to 24	12/0	Crystal semiconductor	Crystal semiconductor	4-band parametric	48
Panasonic	WR-DA7	38x8x2	8/8-	1 AES/EBU or S/PDIF; others optional	1-AES/EBU or S/PDIF; others optional	3 audio; 1 SMPTE v-Sync	16/0	2/6	24-bit	24-bit	4-band parametric/2-band parametric on aux returns	42
Roland	VM-3100 V Mixing Station	12x8x2	2/10	1 S/PDIF (optical/coax)	2 S/PDIF (optical/coax)	N/A	4 1/4", 2 RCA	4 1/4", 2 RCA/0	24-bit	24-bit	3-band	2
Roland	VM-3100PRO V Mixing Station	20x8x2	2/10	1 S/PDIF (optical/coax)	2 S/PDIF (optical/coax)	1 ADAT or TDIF I/O	4 1/4", 2 RCA	4 1/4", 2 RCA/0	24-bit	24-bit	3-band	2
Roland	VM-7100/VM-C7100 V Mixing System	38x14x2	11/1	1 S/PDIF or AES/EBU (w/sample rate conv)	2 S/PDIF and AES/EBU	3 FX, 3 ADAT/TDIF, 1 cascade	Up to 8 TRS (user configured)	Up to 10 (user configured)	24-bit	24-bit	5-band	48 DSP blocks
Roland	VM-7200 (x2) -/ VM-C7200 V-Mixing System	94x14/28 flex busx2	4/1	2 S/PDIF or AES/EBU (w/sample rate conv)	4 S/PDIF and AES/EBU, 1 cascade	6 effects, 6 ADAT/TDIF	24/16	Up to 34/0	24-bit	24-bit	5-band	94 DSP blocks
Roland	VM-7200/ VM-C7200 V Mixing System	48x14x2	21/1	1 S/PDIF or AES/EBU (w/sample rate conv)	2 S/PDIF and AES/EBU	3 effects, 3 ADAT/TDIF, 1 cascade	12/18	Up to 18/0	24-bit	24-bit	5-band	48 DSP blocks
Spirit	Digital 328	32x8x2	16/16	18/16 optical, TDIF, AES/EBU, S/PDIF	26/24 optical, 16 TDIF, AES/EBU, S/PDIF	2	16/16	4/5	24-bit/128x	24-bit/128x	3-band parametric	2 floating
TASCAM	TM-D4000	32x8x2	8/12	1 AES/EBU, 1 S/PDIF; others optional	1 AES/EBU, 1 S/PDIF; others optional	3	8/8	6/4	24-bit	24-bit	4-band parametric	32
TASCAM	TM-D8000	40x8x2 (52 mixdown)	16/28	40 TDIF, 4 AES/EBU, 2 S/PDIF	40 TDIF, 8 AES/EBU, 1 S/PDIF	N/A	16/16	6/12	20-bit	20-bit	4-band parametric	8
TASCAM	TM-D1000	16x4x2	4/10	8 TDIF, 1 AES/EBU, 1 S/PDIF	8 TDIF, 2 AES/EBU, 2 S/PDIF	2	4/4	4/2	20-bit	20-bit	3-band, parametric mid	4
Yamaha	O2R	40x8x2	8/8-4 stereo	1 AES/EBU, 2 S/PDIF; others optional	1 AES/EBU, 2 S/PDIF; others optional	4	8/16	6/2, 1/4" TRS	20-bit	20-bit	Parametric	40
Yamaha	O1V	24x4	12/2	1 S/PDIF; others optional	1 S/PDIF; others optional	1	0/0 (4 using 1/4" OMNI outs)	0/0 (4 using 1/4" OMNI outs)	20-bit	20-bit	4-band parametric	22
Yamaha	O3D	26x10x2	8/18 1/4"	AES/EBU (XLR), S/PDIF (coaxial); others optional	AES/EBU (XLR), S/PDIF (coaxial); others optional	1	2 1/4" TRS/0	4/2 (stereo in)/ 1/4" TRS	20-bit	20-bit and 18-bit	4-band parametric	36

# of Effects Processors	Automation: Scene/MIDI/Dynamic	Frequency Response	Signal-to-Noise Ratio	Total Harmonic Distortion	Channel Crosstalk (@ 1 kHz)	Phantom Power	Special Features	Options	Dimensions (inches)	Price
	Yes/Yes/No	20 Hz–20 kHz	96 dB	0.003%	N/A	Yes	Motorized fader on virtual strip, physical controls on all channel strips	ADAT card, link card	17.5x4.5x19.75	\$1,495
Up to 8 internal	Yes/Yes/Yes	20 Hz–20 kHz	115 dB	0.005%	-90 dB	Yes	Built-in meter bridge, total dynamic automation of virtually every parameter	Clock card, I/O cards, effects card	27.1x37.6x8.7	\$9,999
Channel delay	Yes/Yes/Yes	20 Hz–20 kHz	RN -96 dB typical	<0.1%	-90 dB	Yes	Moving fader automation, 1 step functionality, 5.1 surround sound panning	8 ch I/O cards for ADAT, TDIF, AES/EBU and S/PDIF; analog meter bridge; SMPTE V Sync; automation software for Mac or PC	27.5x13.56x23.7	\$4,995
1 stereo or 2 mono	Yes/Yes/No	N/A	N/A	N/A	N/A	Yes	Dedicated Hi-Z guitar input		3.75x11.8x13.5	\$995
2 stereo or 4 mono	Yes/Yes/No	N/A	N/A	N/A	N/A	Yes	Dedicated Hi-Z guitar input; microphone modeling; speaker modeling	DIF-AT ADAT/TDIF interface	3.75x11.8x13.5	\$1,295
2 (up to 8 optional)	Yes/Yes/Yes	N/A	N/A	N/A	N/A	Yes	Modular; moving faders; 5.1 mixing; RTA; speaker modeling	VS8F-2 FX exp brd; VM-24E I/O exp port; DIF-AT ADAT/TASCAM intrlc; MB-24 mtr brdg; VM-24C cascade kit	VM-7100: 117x16.4x5.25; VM-C7100: 17.12x17x2.7	(VM-7100) \$1,995 (VM-C7100) \$2,995
4 (up to 16 optional)	Yes/Yes/Yes	N/A	N/A	N/A	N/A	Yes	Modular; moving faders; 5.1 mixing; RTA; speaker modeling	VS8F-2 FX exp brd (up to 6); VM-24E I/O exp port; DIF-AT ADAT/TASCAM intrlc; MB-24 mtr brdg; RO-7000 rack-mount kit	VM-7200: 117x16.4x5.25; VM-C7200: 26.6x17x2.7	(VM-7200 (x2)) \$6,590 (VM-C7100) \$3,695
2 (up to 8 optional)	Yes/Yes/Yes	N/A	N/A	N/A	N/A	Yes	Modular; moving faders; 5.1 mixing; RTA; speaker modeling	VS8F-2 FX exp brd; VM (up to 6); VM-24E I/O exp port; DIF-AT ADAT/TASCAM intrlc; MB-24 mtr brdg; RO-7000 rack-mount kit	VM-7200: 117x16.2x2.5; 5VM-C7200: 26.6x17x2.7	(VM-7200) \$2,795 (VM-C7100) \$3,695
2 Lexicon	Yes/Yes/No	20 Hz–20 kHz	N/A	<0.005%	-95 dB	Yes	ADAT optical (x3) and TDIF (x2); meter bridge; AES/EBU, S/PDIF, SMPTE direct; software upgrade via internet	TDIF to MIC preamp; TDIF to analog interface; TDIF to AES/EBU interface	N/A	\$4,999.95
1	Yes/Yes/No	20 Hz–20 kHz	80 dB	<0.1%	90 dB	Yes	100 mm motorized faders; TDIF MMC, ADAT, RS-422, surround/cascade I/O, word clock I/O	IF-TD4000; IF-LA4000; IF-AE4000; IF-AD4000; MU-4000; PW-4000	26x9.5x28	\$4,299
0	Yes/Yes/No	20 Hz–20 kHz	80 dB	<0.1%	-90 dB	Yes	Full machine control; TDIF sync; Sony 9-pin; MMC; meter bridge; word clock I/O	IF-TAD; MA-AD8; IF-AE8	40x12.5x28.5	\$10,799
2	Yes/Yes/No	20 Hz–20 kHz	80 dB	0.1%	-90 dB	Yes	MMC; backlit LCD; word clock I/O	IF-TAO; IF-TD1000; FX-D1000; MA-AD8; IF-AE8; RM-D1000	17.3x4x15	\$1,299
2	Yes/Yes/Yes	20 Hz–20 kHz	105 dB	<0.2% 20 Hz–20 kHz @ +14 dB into 600 ohm	70 dB	Yes		Meter bridge; digital I/O; up to 32 TDIF, AES/EBU, ADAT or Yamaha w/option cards	26x8.5x2.75	\$8,899
2	Yes/Yes/No	20 Hz–20 kHz	98 dB	<0.1% 20 Hz–20 kHz @ +14 dB into 600 ohm	-70 dB ch 1–12; -60 dB ch 13–16; -70 dB in to out	Yes		Digital I/O cards; TDIF, ADAT, AES; analog input	16.9x5.8x20.4	\$1,999
2	Yes/Yes/Yes	20 Hz–20 kHz	105 dB	>0.01% AD/DA @ 1 kHz	-70 dB	Yes	Surround sound	I/O interface cards (TDIF, ADAT, AES/EBU, Yamaha cascade kit, rack ears)	18.1x20.3x8	\$3,699



# 2

## I/O Devices, Monitoring & Power Amps

This section contains information about a variety of products used for audio monitoring, amplification, and signal routing.

Specifications for audio patch bays and direct-injection (DI) boxes are not overly complicated, but significant feature differences do exist among the various models. Be sure to check out the connector type and normalizing scheme of an audio patch bay. A big difference among DI boxes is that some are active and others are passive; also, some models come with special features such as pads, phase-invert switches, and speaker simulators.

Our Digital Audio Converter chart lists only analog-to-digital and digital-to-analog units; we don't include digital format converters. Be sure to check which digital connections a converter supports: some of these products support ADAT Optical input and output, while others support TDIF, AES/EBU, and/or S/PDIF.

Although mic and instrument preamps are relatively simple gadgets, some come with extra bells and whistles such as parametric EQ and lowpass or highpass filters. If you're using condenser mics, you may need phantom power—some mic preamps have it and some don't. Obviously, a tube preamp will sound quite different from a solid-state unit, but because the tubes can be integrated in different ways, the inclusion of a tube does not guarantee that it can produce the classic "warm" sound.

We've grouped channel strips and voice processors into one table because they are often nearly identical in function and can be used for similar purposes. Basically the equivalent of a mixer input channel, they consist of a microphone preamp and an equalizer and are often combined with one or more dynamics processors. Channel strips and voice processors are usually used to route signals directly to a recording device, bypassing the mixer and making outboard processors unnecessary. These "combo" processors save space and can be quite cost effective. Make sure to compare their specifications with those of the mixers, the preamps, and the dynamics processors.

With power amps our focus is on those used for studio applications, but many of the amps listed here can easily be used in club P.A. systems as well. These products' specs can vary widely—for instance, check out the range in the Total Harmonic Distortion column.

With reference monitors it is very important to note the type of porting; among other things, it affects how the sound changes when you move the speakers toward or away from walls, corners, and furniture. Magnetic shielding is also important if you plan to locate the speakers near a computer monitor or other source of electromagnetic interference. Note that some reference monitors are powered by built-in amplifiers, making setup easy. In theory, the onboard amp has been designed to match its speaker and enclosure, but in practice this does not guarantee superior sound.

The biggest concern with headphones is the ear-cup design. Closed headphones offer more isolation, which is great when you're working with open mics (for example, tracking vocals and drum overheads). Open-air designs give an airier sound and tend to be lighter in weight.

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94	Power Amps
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# AUDIO PATCH BAYS

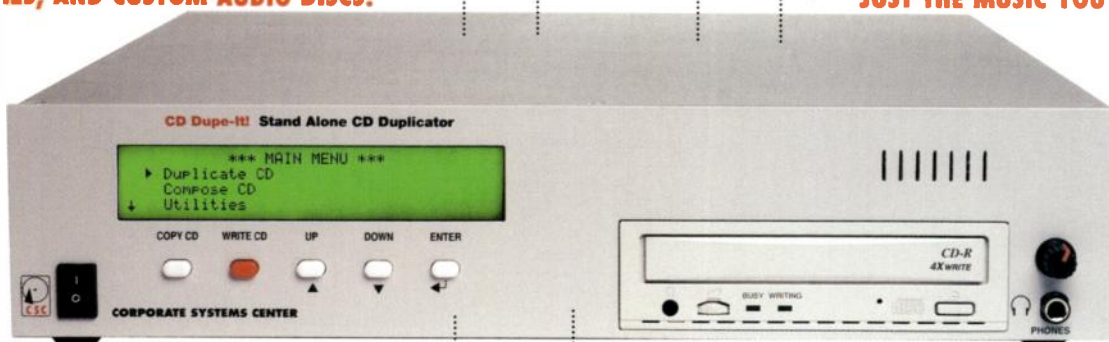
Manufacturer	Product	Connector Type	# of Patch-Bay Points	Prewired	Modular	Programmable	Normaling	Special Features	Price
Connectronics	JB24	1/4" 1/4" TRS	48	Yes	Yes	No	Full, half, through	Plug in rear	\$775
Connectronics	XB16KV/XB32KV	Any combination	16 or 32	Yes	Yes	No	N/A	Wide range of connectors	(16) \$94 (32) \$174 w/o connectors
dbx	PB48	1/4" TRS	48	No	Yes	No	Full, half		\$179.95
Fostex	3013	1/4"	16	Yes	No	No	Half		\$139
Furman	PB-40	1/4" TRS, RCA	40	Yes	Yes	No	Half		\$155-\$180
Neutrik	Easy Patch	TB	48	Yes	No	Yes	Full, half, no, parallel, double	Solderless	\$725
Neutrik	Easy Patch	TT	96	Yes	No	Yes	Full, half, no, parallel, double	Solderless, digital-capable	\$775
Neutrik	Patchlink SP	1/4"	48	No	Yes	Yes	Full, half, isolated, parallel	Normalised jack colored gray for easy ID	\$125
Neutrik	Rean MA 96	TT	96	No	No	No	All options	Color coded front panels	N/A
Neutrik	Rean MA-48E Series	TT	48	Yes (to EDAC)	Yes	Yes	All options		N/A
Pro-Co	PJ Series	1/4" TRS; PJ, WECO, Longframe	24/row, 1 or 2 row/rack space (52 pt. max)	Optional	No	No	All options	Many custom options	\$250-\$1,600
Pro-Co	PM-148	1/4"	48	Yes (PC cards)	Yes	Yes	Full, half, parallel, open	Optional multi-track harnesses	\$333.22
Pro-Co	TT Series	TT	96 per rack space	Optional	No	No	Determined by jack loading/wiring	Many custom options	\$600-\$2,800
Radial Engineering	Radial	TT; 1/4" 1/4" TRS	24-96	Optional	Optional	No	All options	Custom punch blocks	\$130-\$1,200
Rapco	Rapco Patch bay	TT; 1/4" 1/4" TRS	48, 52 or 96	Yes	Yes	No	All options	Custom wiring	Starting at \$199
Switchcraft	1/4" Kit Series	1/4" TRS	48 or 52	No	No	No	Full, half, no	Cable tray, nickel-plated jacks, gold contacts	\$220
Switchcraft	Front Access Series	TT, MT	96 or 48	Yes	No	No	Normals strapped, normals out	Front access, nickel-plated jacks, gold contacts	\$1,100
Switchcraft	MT48/52 Series	1/4" TRS	48 or 52	No	No	No	Full, half, no	Tie bar, nickel-plated jacks, gold contacts	\$230
Switchcraft	MTP Series	1/4" TRS	48	Yes	No	No	All options		\$700
Switchcraft	TT Kit Series	TT	96	No	No	No	Full, half, no	Cable tray, nickel-plated jacks, gold contacts	\$300
Switchcraft	TT96 EDAC Series	TT	96	Yes	No	No	Full; normals	EDAC-type connectors on back	\$1,300
Switchcraft	TTP96 Series	TT	96	No	No	No	Full; half; no	Tie bar, nickel-plated jacks, gold contacts	\$300
TASCAM	PB-Series	TT, 1/4"; 1/4" TRS	32 or 64	Yes	Yes	No	Full		Starting at \$185
Taytrix	Audio Patch Bays	TT	96	Optional	Yes	No	Full, half	Customized to any specs	Starting at \$1,500
Whirlwind	WLF482	Long frame balanced	48	Optional	Yes	No	Full, half, wired		\$399.95
Whirlwind	WPB-48S	1/4" TRS	48	Yes	Yes	No	Half; no (each jack pair)		\$159.95
Whirlwind	WPB-48S/R	1/4" TRS, RCA	24 1/4" or 24 RCA	Yes	Yes	No	Half; no (each jack pair)		\$189.95
Whirlwind	WTT961	TT	96	Optional	Yes	No	Full, half, user	1 rackspace	\$529.95
Z-Systems	Digital Detanglers	AES/EBU and/or S/PDIF	8-64 stereo pairs	Yes	No	Yes	N/A	Hardware remote; computer control	\$980-\$12,000
Zoom	Ultrapatch Pro	1/4"	48	No	No	No	N/A	Switches for parallel, norm, semi-norm, and open	\$89.99

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# DIRECT BOXES

Manufacturer	Product	Type	Power	# of Channels
AMB	Tube-buffered direct injection box	Floor	Internal AC	1
Anthony DeMaria Labs	300 G	Floor or rack-mount	External AC	2
ARX	DI-1	Active	Battery, Phantom, wall wart	1
ARX	DI-2	Active	Battery, Phantom, wall wart	2
ARX	DI-4	Active	AC 110V	4
ARX	DI-6s	Active	AC 110V	6
Avalon Design	U5	100% discrete, pure Class A, 2-space rack-mount	Active, AC	1
Barcus-Berry	Matchmaker	Floor	9V battery, 9 VDC external Phantom	1
BBE	DI-10 Active DI	Active DI single channel w/speaker cab emu	Phantom, external adapter, 9V battery	1
BBE	DI-10	Floor	Phantom, external adapter, 9V battery	1
BBE	DI-100	Floor	Phantom, external adapter, 9V battery	1
Boss	DI-1	Floor	Phantom, battery	1
BSS Audio	AR133	Floor	Phantom, battery	1
BSS Audio	AR416	Rack-mount	Internal AC	4
Countryman	Type 85	Floor	Phantom, battery	1
Demeter	H DI-1 H series Tube Direct Box/Line Driver	Rack	AC	2
Demeter	STDB-2 Stereo Direct Box	Rack-mount (1 space)	AC	2
Demeter	VTDB Tube Direct Box (mono)	Floor	AC	1
Digital Music	Cab-Tone	Stand-alone	9V DC	1
DOD	AC260	Floor	Passive	1
DOD	AC265	Floor	Passive	1
DOD	AC275	Floor	AC, battery, phantom	1
Dynaudio Acoustics	Reamp	Freestanding	Passive	1
E.M.O.	E520	Floor	Passive	1
E.M.O.	E525	Floor	Passive	2
E.M.O.	E535	Rack-mount	Passive	1
E.M.O.	E540	Floor	Passive	1
E.M.O.	E545	Rack-mount	Passive	6
E.M.O.	E580	Rack-mount (1 space)	Passive	8
Ebtech	HE-2 PKG	Table or rack-mount	Passive	2
Ebtech	HE-8	Rack-mount	Passive	8
Ebtech	LLS-2 PKG	Table or rack-mount	Passive	2
Ebtech	LLS-8	Rack-mount	Passive	8
Fishman	Dual Parametric D.I.	Floor	AC, 9V battery	1
Folded Space	Micro Room	Floor	Passive	1
Gepco	GDB-1	Floor	Passive	1
Jensen Transformers	ISO-MAX DB-2PX	Stand-alone or rack-mount	Passive	2
Klark-Teknik	LBB100	Floor	Phantom	1
Peavey	1.1 Interface	Floor	Passive	1
Peavey	EDB-1	Floor	Phantom, battery, 16V AC/DC external	1
Peavey	EDI	Floor	Passive	1

Inputs	Outputs	Ground Lift	Special Features	Price
1/4" (1)	1/4" (1), XLR (1)	Yes	ECC83 tube, Jensen JT-DB-E transformer	\$595
1/4" (1)	1/4" (2), XLR (2)	Yes	Gain	\$899
1/4"	XLR	Yes	Easy battery change	\$115
1/4"	XLR	Yes	Easy battery change	\$165
1/4"	XLR	Yes	Mixes 4 channels to stereo, auxiliary sound/return	\$410
1/4"	XLR	Yes	Mixes 6 channels to 1 output, also a 1-to-6 splitter	\$442
1/4" instrument, 1/4" speaker	XLR (mic/line), 1/4" TRS	Yes	3 Mohm input, variable gain to +30 dB, high-cut filter, 6-position tone switch, rack kits available	\$595
1/4", 1/4" speaker	1K $\Omega$ 1/4", 1/4" spkr, 600 $\Omega$ XLR	No	Speaker-simulated filter	\$129
1/4" line, or via speaker throughputs	600 $\Omega$ (XLR), 1K $\Omega$ (1/4")	No	Speaker in/thru jacks, filter switch, tri-mode powering	\$129
1/4", 1/4" speaker	1/4", 1/4" speaker, XLR	No	Speaker-simulated filter	\$129
1/4"	1/4", XLR	Yes	BBE process, input pad	\$159
1/4"	1/4", XLR	Yes	Auto power-off, phase-inverse	\$149.50
1/4", XLR	1/4", XLR	Yes	Pad (0, -20, -40 dB)	\$185
1/4" (4)	1/4" (4), XLR (4)	Yes	Pad (0, -20, -40 dB), LP filter, phase reverse, reverse rack ears (XLR front or rear)	\$899
1/4"	1/4", XLR	Yes	Isolates ground even w/phantom power, RF filtering and static-discharge prot	\$231.70
1/4" (2)	XLR (2), 1/4" (2)	Yes	27 Mohm input impedance/balance in level out, tube buffered 1/4" outs	\$899
1/4" (2)	XLR, 1-1/4" (2) unity gain, variable gain line (2)	Yes	All tube, Jensen DBE out transformer, 27 Mohm input, variable gain best, tube buffered outs	\$1,100
1/4"	1/4", XLR	Yes	Jensen output transformers, gain best, tube buffered 1/4" out	\$600
1/4"	1/4", XLR	Yes	Gr speaker cabinet sim, line & speaker level signals, ground lift and phase invert, bal/unbal in level outs	\$149
1/4" (2), XLR	1/4" (2), XLR	No	Can be mic/instrument splitter	\$65
1/4" (2), XLR	1/4" (2), XLR	Yes	3-position pads	\$89.95
1/4" (2), XLR	1/4" (2), XLR	Yes	Speaker/instrument level switch	\$99.95
+4 dBm XLR	-10 dBm 1/4"	Yes	Reverse direct box, allows output from recorder to be reinserted into amplifier input, adjustable out level	\$299
1/4" In, 1/4" instrument (2), 1/4" speaker (2)	XLR	Yes	20 Hz-40 kHz frequency response	\$124
1/4" In (2), 1/4" instrument (4), 1/4" speaker (4)	XLR (2)	Yes	20 Hz-40 kHz frequency response	\$359.50
1/4" (2), 1/4" instrument (4), 1/4" speaker (4)	XLR	Yes	20 Hz-40 kHz frequency response	\$129.50
1/4" In, 1/4" instrument (2), 1/4" speaker (2)	XLR	Yes	High isolation	\$189.95
1/4" (6), 1/4" instrument (12), 1/4" speaker (12)	XLR (6)	Yes	20 Hz-40 kHz frequency response, uses E535 mods	\$744.50
1/4" (8)	1/4", XLR	Yes	Parallel unbalanced outs for ICI monitoring	\$1,225
1/4" (2)	1/4" (2)	No	4 RCA adapters, brks grnd lps, converts automatically between balanced and unbalanced ins	\$74.95
1/4" (8)	1/4" (8)	No	Breaks ground loops, converts automatically between balanced and unbalanced ins	\$284.95
1/4" (2)	1/4" (2)	No	Converts -10 dBV to +4 dBu, 4 RCA adapters, hum eliminated, converts automatically between balanced and unbalanced ins	\$89.95
1/4" (8)	1/4" (8)	No	Converts -10 dBV to +4 dBu equipment, hum eliminated, auto converts between balanced and unbalanced ins	\$344.95
1/4"	1/4", XLR	Yes	2-band parametric EQ, phase reverse	\$239.95
1/4" (2)	XLR	No	Real speaker-to-mic receive silently, I/O electronically isolated	\$395
1/4" (2)	XLR	Yes	20 dB pad	\$34
1/4" (2)	XLR (2)	Yes	Jensen JT-DB-EPC transformer	\$199.95
1/4" (2), XLR	XLR	Yes	Switchable I/O attenuation, isolated transformer	\$175
1/4", XLR	1/4", XLR	Yes		\$59.99
1/4"	1/4", XLR	No		\$69.99
1/4"	1/4", XLR	No		\$59.99



# DIRECT BOXES

Manufacturer	Product	Type	Power	# of Channels
Peavey	IA 10/4	Floor	External 16.5 VAC wall wart	2
Peavey	ID-1G	Floor	Passive	1
Peavey	Patching Adapter	Floor	Passive	1
Peavey	PD-4	Floor	Passive	1
Peavey	PS-2C	Floor	Battery	2
Peavey	PS-4AC	Floor	External 16.5 VAC wall wart	4
Pro-Co	AV 1	Floor or 1/4 rack	Passive	4
Pro-Co	AVP 1	Wall plate	Passive	1
Pro-Co	CB-1	Floor or 1/4 rack	Passive	1
Pro-Co	DB-1	Floor or 1/4 rack	Passive	1
Pro-Co	DB-4A	1 rack space	Passive	4
Pro-Co	IT 1	Floor or 1/4 rack	Passive	4
Pro-Co	MC 2	Floor or 1/4 rack	Passive	1
Pro-Co	MS 1	Floor or 1/4 rack	Passive	1
Pro-Co	MS 3	Floor or 1/4 rack	Passive	1
Pro-Co	MS 42A	1 rackspace	Passive	4
Pro-Co	MS 43A	1 rackspace	Passive	4
Pro-Co	MS 82	1 rackspace	Passive	8
Pro-Co	MS 83	1 rackspace	Passive	8
Radial Engineering	Radial JD4	Rackmount	Passive	4
Radial Engineering	Radial JDI	Floor	Passive	1
Radial Engineering	Radial JDV	Floor	Active	1
Rapco	ADB+8	Floor	Battery, phantom	1
Rapco	DB-100	Floor	Passive	1
Rapco	DB-101SL	Floor	Passive	1
Rapco	DBR400	Rack-mount	Passive	4
Roland	DI-1	Floor	Battery, phantom	1
Rolls	ADB2	Floor	Phantom	1
Rolls	ADB3	Floor	External AC	2
Rolls	DB14	Floor	Passive	1
Rolls	DB25	Floor	Passive	1
Rolls	RDB104	Rack-mount	Internal AC	4
Stedman	BA-18	Floor	Self-powered	1
Stedman	GA-12	Floor	Self-powered	1
Stewart Audio	ADB-1	Rack-mount or floor	9V battery, 48V phantom	1
Stewart Audio	ADB-4	Rack-mount or floor	External supply; 48V phantom	4
Tech 21	SansAmp Acoustic DI	Floor	Phantom, 9V battery, optional DC power supply	1
Tech 21	SansAmp Bass Driver DI	Floor	Phantom, 9V battery, optional DC power supply	1
Tube Works	4001	Floor	External 30 VAC	1
Tube Works	4002	Rack-mount	External 30 VAC	2
Westcam	DB-1E	Floor and music stand	Passive Jensen Transformer (JT-DB-E)	1
Westcam	DB-4E	Rack-mount, 1 space	Passive Jensen Transformer/JT-DB-E	4
Whirlwind	Director	Floor	Passive	1
Whirlwind	HotBox	Floor	Battery, phantom	1
Whirlwind	HotBox Quad	Rack-mount	Internal AC	4
Whirlwind	IMP 2	Floor	Passive	1
Whirlwind	Mic Eliminator (guitar)	Floor	Battery, phantom	1
Whirlwind	Multi Director	Rack-mount	Passive	4

Inputs	Outputs	Ground Lift	Special Features	Price
1/4" (2); XLR (2)	1/4" (2); XLR (2)	0		\$99.99
1/4"	XLR (2)	Yes		\$49.99
1/4"	1/4" (5)	No		\$27.99
1/4"	1/4" (4)	No	Mono/stereo switch, headphone distributor	\$39.99
XLR (2)	XLR (2)	No		\$57.99
XLR (4)	XLR (4)	Yes	Provides phantom power to 4 electret condenser mics	\$129.99
1/4" TRS, 1/8", RCA	1/4" TRS, XLR	Yes	Line/speaker level in; high cut	\$122.20
1/4", RCA; XLR	Barrier strip	Yes	Line/speaker level in	\$122.20
1/4"	1/4", XLR	Yes	High headroom transformer	\$55.47
1/4"	1/4", XLR	Yes	Line/speaker level in, high cut, high headroom transformer	\$122.20
1/4"	1/4", XLR	Yes	Line/speaker level in, high cut, high headroom transformer	\$333.22
1/4" TRS, XLR	1/4", XLR male and female	Yes	High dynamic headroom, external low frequency response	\$122.20
XLR (2)	XLR	N/A	Low noise, high headroom	\$122.20
XLR	XLR (2 direct/isolated)	Yes	Low noise, high headroom	\$122.20
XLR	XLR (3 direct/isolated)	Yes	Low noise, high headroom	\$122.20
XLR	XLR (2 direct/isolated)	Yes	Low noise, high headroom	\$333.22
XLR	XLR (2 direct/isolated)	Yes	Low noise, high headroom	\$444.33
Phoenix barrier strip	Phoenix barrier strip (2 direct/isolated)	Yes	Low noise, high headroom; phantom available on P	\$655.56 (phant) \$722.22
Phoenix barrier strip	Phoenix barrier strip (3 direct/isolated)	Yes	Low noise, high headroom; phantom available on P	\$877.78 (phant) \$944.44
* 1/4" front (8), 1/4" rear (8)	XLR (4)	Yes	Merged input pairs, phase reverse, pad (15 dB), ultrasonic noise filter	\$899.95
1/4" (2)	XLR	Yes	Merged inputs, pad (15 dB), ultrasonic noise filter	\$239.95
1/4" (2)	XLR	Yes	NiCad rechargeable batteries, Class A design	\$299.99
1/4"	1/4", XLR	Yes	3-position switch for mic level, unity gain, or +8 dB forward gain	\$208
1/4"	1/4" (4), XLR (4)	Yes	Special ground-lift jack (instead of switch)	\$49.95
1/4"	1/4" (4), XLR (4)	Yes	Accepts instrument and speaker-level signals for "overdrive"	\$59.95
1/4" (4)	1/4" (4), XLR (4)	Yes	4 units in single rackspace	\$249
1/4"	1/4", XLR	Yes	Auto power-off, phase-inverse	149.50
1/4" (2)	XLR	Yes	3-position attenuation	\$50
1/4" (4)	XLR (2)	Yes	Tube-based, 20 dB gain	\$200
RCA (2)	RCA (2), XLR	No	2 volume controls	\$70
1/4" (2)	XLR	Yes	3-position attenuation	\$35
1/4" (8)	XLR (4)	Yes		\$200
1/4"	1/4", XLR	Yes	Speaker reactor circuit simulates 18" bass guitar speaker w/o battery	\$119
1/4"	1/4", XLR	Yes	Speaker reactor circuit simulates 12" guitar speaker w/o battery	\$119
1/4"	1/4", XLR	Yes	Transformerless	\$109
XLR (4)	1/4", XLR (4)	Yes	Transformerless, input-sensitivity selectable, ground lift on each channel	\$379
1/4" (2)	1/4", XLR	Yes	Semi-parametric EQ, tube/mic emulation, FX loop, level/blind/mid shift, active bass/mid/treble	\$225
1/4"	1/4" (2); XLR	Yes	Tube amplifier emulation for bass, presnc/drive/level/blind controls, active bass/treble	\$225
1/4" (1)	1/4", XLR; 1/4" speaker/loop out	Yes	Speaker/normal switch, boost (XLR only)	\$195
1/4" (2)	1/4" (2); XLR (2); 1/4" speaker/loop out (2)	Yes	Speaker/normal switch, boost (XLR only), transformerless DC out	\$395
1/4"	XLR	Yes	Gold-plated switches/jacks; pad, filter	\$179.95
1/4" (2) front and rear	XLR (2) front and rear	Yes	Locking gold-plated switches/jacks; pad/filter, RFI filter	\$675
1/4"	1/4" (2), XLR	Yes	Instrument/amplifier switch; LP switch	\$99.95
1/4"	1/4", XLR	Yes	Instrument/amplifier switch, extremely high input impedance	\$179.95
1/4" (4)	1/4" (4); XLR (4)	Yes	Instrument/amplifier	\$799.95
1/4"	1/4", XLR	Yes		\$59.95
1/4"	1/4", XLR	Yes	Emulates SM57 on- or off-axis in front of 12" guitar speaker, instrument/speaker input switch	\$99.95
1/4" (4)	1/4" (4); XLR (4)	Yes	Instrument/speaker switch; LP switch	\$379.95



# DIGITAL AUDIO CONVERTERS

Manufacturer	Product	Converter Type/#	ADC Resolution, Over Sampling	DAC Resolution	Sample Rate(s)	Sample Rate Conversion	Dither	Analog I/O #/Type
Alesis	AI3	A/D (8), D/A (8)	20-bit/128x	20-bit/128x	48 kHz (externally variable from 40.4–50.8 kHz)	No	No	8/1/4" TRS
Apogee Electronics	AD-8000	8-channel conversion system w/optional D/As and interface card	24-bit	N/A	44.1, 48 kHz	No	UV22(R) instead	(8) XLR
Apogee Electronics	PSX-100	A/D (2), D/A (2)	24-bit	N/A	44.1, 48, 88.2, 96 kHz	No	UV22(R) instead	(8) XLR
Apogee Electronics	Rosetta AD	A/D (2) conversion	24-bit	N/A	44.1, 48 (optional 88.2, 96) kHz	No	UV22(R) instead	(2) XLR
Benchmark	AD2404-96	A/D (4)	24-bit/128x @ 44.1, 48 kHz; 64x @ 88.2 and 96 kHz	N/A	44.1, 48, 88.2, 96 kHz, varispeed	No	Yes (to 16- or 20-bit)	(4) XLR
Benchmark	AD2408-96	A/D	24-bit/128x @ 44.1 and, 48 kHz; 64x @ 88.2 kHz	N/A	44.1, 48, 88.2, 96 kHz, varispeed	No	Yes (to 16- or 20-bit)	(8) XLR
Benchmark	ADA 2008	A/D, D/A	20-bit/64x	20-bit	44.1, 48 kHz, varispeed (28–54 kHz)	No	No	(8) XLR
Crane Song	HEDD	A/D, D/A	24-bit	24-bit (stereo)	44.1, 48 kHz	No	No	N/A
Empirical Labs	MusicNet AD24	A/D	24-bit	24-bit	44.1, 48 kHz	Yes	Yes	(8) XLR
Empirical Labs	MusicNet DA24	D/A	24-bit/16-bit	24-bit/20-bit	44.1, 48 kHz	Yes	Yes	(8) XLR
Frontier Design	Tango 24	A/D (8), D/A (8)	24-bit/128x	24-bit/128x	44.1, 48 kHz, 39–51 kHz from external clock	No	No	(8x8) 1/4" TRS
Frontier Design	Zulu	A/D (4), D/A (8)	20-bit/128x	20-bit/128x	39–51 kHz from optical input	No	No	(4x8) 1/4"
Independent Audio	dCS Ltd DAC 904	A/D	24-bit	No	44.1, 48, 88.2, 96, 176.4, 192 kHz, Sony DSD	No	No	(2) XLR
Independent Audio	dCS Ltd DAC 954	D/A	No	24-bit	44.1, 48, 88.2, 96, 176.4, 192 kHz, Sony DSD	No	No	(2) XLR
Independent Audio	dCS Ltd DAC 972	DDC 972	No	No	44.1, 48, 88.2, 96, 176.4, 192 kHz, Sony DSD	Yes	No	N/A
Lucid	AD9624	A/D (2)	24-bit/128x		32, 44.1, 48, 88.2, 96 kHz	Yes	Yes	(2) XLR
Lucid	ADA8824 (ADAT)	A/D (8), D/A (8)	24-bit/128x	24-bit/128x	44.1, 48 kHz	Yes	No	(8) XLR
Lucid	ADA8824 (Sonic)	A/D (8), D/A (8)	24-bit/128x	24-bit/128x	44.1, 48 kHz	Yes	No	(8) XLR
Lucid	DA9624	D/A (2)	N/A	24-bit/128x	32, 44.1, 48, 88.2, 96 kHz	Yes	No	(2) 1/4" TRS, XLR
Midiman	Flying Cal# AD	A/D	24/128x	N/A	44.1, 48 kHz	No	No	(2) 1/4"
Midiman	Flying Cal# DA	D/A (2)	N/A	24-bit/128x	All incoming	No	No	(2) 1/4"
Midiman	Flying Cow 24-bit	A/D (2), D/A (2)	24-bit/128x	24-bit/128x	32, 44.1, 48 kHz, external	No	No	(2) 1/4"
Midiman	Pipeline 8x8	A/D (8), D/A (8)	24-bit/128x	24-bit/128x	44.1, 48 kHz	No	Yes	(8) 1/4"
Mytek Digital	8x96 Series ADC and DAC	8-channel	24-bit/64x, 128x	24-bit	44.1, 48, 88.2, 96 kHz	No	Yes	(8) XLR
Mytek Digital	D-Master 9624	A/D (8), D/A (8)	24-bit/64x, 128x	24-bit	32, 44.1, 48, 88.2, 96 kHz	No	Yes	(4) XLR

Digital I/O #/Type	Word Clock I/O	Video Input Sync	RF Filtering	THD	Dynamic Range	Special Features	Price
ADAT (optical)	No	No	Yes	0.0030%	96 dB	Signal/clip metering; optical out source switch	\$499
(8) AES/EBU, (2) S/PDIF; other interfaces on plug-in cards	Yes	Yes (Optional video sync card)	Yes	-110 dB (A-weighted)	≥114 dB (-60 dB A-Weighted)	Optional: 2-channel/8-channel D/A, AMBus digital I/O (includes ProTools, ADAT, TDIF, AES/EBU, SDIF-II, SSL HiWay, ST optical) cards; ABS; low jitter clock	basic unit \$5,995 ("SE" version) add \$2,500 (cards) \$495-\$1,595
AES/EBU, S/PDIF (coax/opt); ADAT, TDIF	Yes	Yes (Optional video sync card)	Yes	-112 dB (-0.1 dBFS A-weighted)	≥119 dB (-60 dB A-weighted)	3 modes enable cross-connection of A/D and D/A; ABS bit-splitting; low jitter clock	\$2,995
AES/EBU, S/PDIF (coax/opt); ADAT, TDIF	Yes (out only)	No	Yes	-112 dB (-0.1 dBFS A-weighted)	≥119 dB (-60 dB A-weighted)	Upgradable from 44.1/48 kHz to 88.2/96 kHz; pro/consumer analog in	(44.1/48 kHz version) \$1,295 (44.1/48/88.2/96 kHz vers) \$1,995
(2) AES3 (110Ω) XLR or AES21d (75Ω) BNC; S/PDIF	No	No	Yes	0.00003% @ 1 dB FSD (20 Hz–20 kHz)	117 dB	Jitter-reducing PLL circuitry; (4) 9-segment digital meters	\$2,800
4/AES3 (110Ω) XLR or AES21d (75Ω) BNC; S/PDIF	No	No	Yes	0.00003% @ 1 dB FSD (20 Hz–20 kHz)	117 dB	Jitter-reducing PLL circuitry; (4) 9-segment digital meters	\$4,995
AES; ALR (110Ω); BNC (75Ω)	No	No	Yes	0.0004% @ -1 dB FSD (20 Hz–20 kHz)	110 dB	CCIF IM = -128 dBFS (0.00004%) @ -1 dB FSD	N/A
AES; S/PDIF	Yes	No	Yes	Depends on process	>117 dB	DSP generates tricode, pentode tube sound in the digital domain	\$2,975
ADAT Lightpipe	Yes (in only)	N/A	No	0.007%	>113 dB	Rack unit	\$749
ADAT Lightpipe	Yes (out only)	N/A	No	0.007%	>106 dB	Rack unit	\$549
(8) ADAT optical in/thru/out	Yes	N/A	Yes	0.002% (A-weighted)	105 dB (A-weighted)	+4 dBu or -10 dBV, selectable per channel	\$699 (bundle prices available w/Dakota or Wave Center)
(8) ADAT optical	No	N/A	Yes	0.002% (A-weighted)	>98 dB		\$399 (bundle prices available w/Dakota or Wave Center)
(4) AES/EBU, SPDIF	Yes, (referencing input)	No	Yes	N/A	125 dB	Ultra-high sample rates	\$7,335
(4) AES/EBU, SPDIF	Yes (referencing input)	No	Yes	N/A	125 dB	Ultra-high sample rates	\$7,335
(4) AES/EBU (2) S/PDIF; SDIF-2	Yes	No	No	N/A	N/A	Ultra-high sample rates	\$6,320
(2) AES/EBU; S/PDIF (coax); Toslink	Yes	No	Yes	<0.002%	>115 dB	User-selectable 16-bit noise shaping; 20-segment input level LED ladders w/peak/hold/clip indicator	\$899
(4) AES/EBU; S/PDIF; RCA (coax); (2) ADAT (optional)	Yes	No	Yes	<0.005%	>113 dB A/D; >105 dB D/A	ADAT optical (Lightpipe) I/O; ADAT sync I/O connectors	\$3,295
(4) AES/EBU; S/PDIF; RCA (coax); (2) Sonic USP	Yes	No	Yes	<0.005%	>113 dB A/D; >105 dB D/A	Works with Sonic Solutions DAW using SonicStudio 16.24 card	\$3,295
(2) AES/EBU; S/PDIF (coax); Toslink	No	No	Yes	<0.002%	>114 dB	Separate headphone volume control; front panel out; 20-segment output level LED ladders	\$749
S/PDIF	No	No	No	0.005%	dB (A-weighted)	100 dB	\$249.95
S/PDIF in	No	No	No	0.002%	dB (A-weighted)		\$199.95
(2) AES/EBU; (2) S/PDIF	No	No	No	0.003%	103 dB		\$499.95
Lightpipe	Yes	No	Yes	N/A	106 dB		\$899
(4) AES/EBU; (2) ADAT (Lightpipe); optional ProTools; Sonic; TDIF	Yes	No	Yes	-106 dB	120 dB	Bit splitting; format conversion; 96 kHz	\$2,995
AES/EBU; S/PDIF; SCSI; others optional	Optional	Optional	Yes	-106 dB	120 dB	Full-featured HD mastering recorder with high-performance converters and processing	\$4,995



# DIGITAL AUDIO CONVERTERS

Manufacturer	Product	Converter Type/#	ADC Resolution, Over Sampling	DAC Resolution	Sample Rate(s)	Sample Rate Conversion	Dither	Analog I/O #/Type
Sonorus	AudI/O AD/24	A/D (8)	24-bit, 128x	N/A	44.1, 48 kHz; 32–50 kHz	No	No	(8) XLR
Sonorus	AudI/O AD/9624	A/D (8)	24-bit	N/A	44.1, 48, 88.2, 96 kHz	No	Yes	(3) XLR
Sonorus	AudI/O DA/24	DA/8	N/A	24-bit/128x	44.1, 48 kHz; 32–50 kHz	No	No	(8) XLR
Sonorus	AudI/O DA/9624	D/A	24-bit	N/A	44.1, 48, 88.2, 96 kHz	No	Yes	(8) XLR
Studer	MicAD	A/D	20-bit	N/A	44.1, 48 kHz	No	Yes	(8 mic/8 line) XLR
Studer	MultiDac	D/A (8)	N/A	23-bit	44.1, 48 kHz	Yes (switchable)	No	(8) XLR
Studer	MicValue	D/A (2)	20-bit	N/A	44.1, 48 kHz	No	Yes	(6) XLR (mic/line in, insert sound/return, line out)
Zefiro Acoustics	Zefiro In Box	A/D	20-bit/128x	N/A	44.1 kHz	Yes	Yes	(2) XLR in, RCA line in (optional)

# MICROPHONE & INSTRUMENT PREAMPS

Manufacturer	Product	Type	Channels	EQ	Output Level Control	Instrument/Line Input
Amek	9098 EQ	TLA (Transformer-Like Amplifier)	1	4-band parametric; variable HP/LP	No	Yes
Amek	DMA	TLA (Transformer-Like Amplifier)	2	HP filter	No	Yes
Aphex Systems	107	Tube	2	Low-cut filter (80 Hz)	Yes	No
Aphex Systems	1788	Solid state	8	Low-cut filter	Yes	Yes
API	512C	Solid state	1	N/A	Yes	Yes
A.R.T.	Dual MP	Tube	2	N/A	Yes	Yes
A.R.T.	Pro MPA	Tube	2	Variable HP filter (15–150 Hz)	Yes	Yes
A.R.T.	Tube MP	Tube	1	N/A	Yes	Yes
ARX	MIXX	Transistor	4	Low 100 Hz shelving; mid 800 Hz bell; broad Q; high 10 kHz shelving	Yes	Yes
ARX	MIXXmaster	Transistor	4	Low 100 Hz shelving; mid 800 Hz bell; broad Q; high 10 kHz shelving	Yes	Yes
Audio Engineering Associates	MS 380 TX	Solid state	2	40 Hz, 18 dB/oct HP filter	Yes	Yes
ATI	8MX2	Solid state	8 mic/8 line	N/A	Yes	Yes
Audio Upgrades	High Speed Mic Preamp	Solid state	2	N/A	Yes	No

Digital I/O #/Type	Word Clock I/O	Video Input Sync	RF Filtering	THD	Dynamic Range	Special Features	Price
ADAT, Toslink	Yes	No	Yes	>103 dB THD +N	117 dB SNR		\$799
(4) AES/EBU, S/MUX dual ADAT	Yes (TTL or AES 11 on BNC)	No	Yes	106 dB	120 dB	Prism Sound MR-X format, optional TDIF, Sonic, ProTools plug-in cards	\$2,995
ADAT, Toslink	Yes	No	Yes	97 dB THD +N	106 dB (A-weighted)		\$599
(4) AES/EBU, S/MUX, dual ADAT	Yes (TTL or AES 11 on BNC)	No	Yes	101 dB	109 dB	Prism Sound MR-X format, optional TDIF, Sonic, ProTools plug-in cards	\$2,995
AES/EBU out (optional ADAT, TDIF)	Yes (BNC; AES/EBU input sync)	No	Yes	≥85 dBFS	<106 dB	Remote controllable	\$4,950
AES/EBU out (optional ADAT, TDIF)	No	No	Yes	≤116 dBFS @ -30 dBFS	>116 dBFS	Front-panel mix monitor	\$3,175
AES/EBU out (optional ADAT, TDIF)	Yes (BNC)	Yes (AES/EBU sync in)	Yes	>104 dB	106 dB	Tube gain stage (switchable) with drive control/EQ	\$3,025
S/PDIF (optical/coax) out	No	No	Yes	0.0018%	>99 dB	Built-in mic preamp	\$295

Fry Warning	Frequency Response	Noise	Total Harmonic Distortion	Special Features	Price
N/A	10 Hz–110 kHz (@ -1.5 dB)	-100 dBu	<0.01%	Phantom, notch filters, NEVE glow and sheen	\$2,269
(2) 8-segment LED	10 Hz–110 kHz (@ -3 dB)	-104 dBu S/N	<0.01%	Phantom, MS surround	\$1,710
Clip LED	20 Hz–30 kHz	-128 dBu EIN	0.2%	Remote mute, Tubessence phantom, gain cntrl, pad	\$449
Clip LED	10 Hz–20 kHz (@ ±0.2 dB)	-124 dBu EIN	0.3%	2 outs pr ch; individual headphone monitoring of selected channels; clickless remote gain change; indiv lmters, dglt out module (\$995)	\$4,495
Yes	30 Hz–20 kHz (@ +0/-3 dB)	-129 dB @ -60 dB of gain	<0.05%	Reissue '70s API mic pre; 7-seg input LED; phase, phant, 20 dB pad, 1/4" /XLR frnt pnt ins, fits 500 Series frames/consoles	\$825
3-segment LED, clip LED	10 Hz–20 kHz	-129 dBu EIN	<0.1%	Phase, phantom, +20 dB gain switch	\$349
10-segment LED	20 Hz–40 kHz	-132 dBu EIN	<0.1%	Output-level VU meters, phase, phantom, 5-year warranty	\$649
Clip LED	10 Hz–20 kHz	-129 dBu EIN	<0.1%	Phase, phantom	\$139
N/A	20 Hz–20 kHz	-90 dB	<0.005%	Phantom, can also mix to a stereo pair for monitoring	\$454
N/A	20 Hz–20 kHz	-90 dB	<0.005%	Phantom, can also mix to a stereo pair for monitoring	\$418
10 dB headroom warning	10 Hz–30 kHz	111 dB S/N	<0.04%	Phant/AB pwr; dbl matrix for MS and X-Y stereo-width adj, 120/240 VAC ext pwr supp, 84 dB gain	\$2,295
(2) 10-segment LED	20 Hz–20 kHz	94 dB S/N, -129 dBm EIN	0.005%	Variable threshold limiter on each input (8), phase, phant/grnd lift on ech ch, 8x2 mixer w/8 outs	\$1,899
Clip LED	0.5 Hz–4 MHz	-132.06 dB EIN	0.0005%	Military RF-input transistors; audiophile MIT/Infinitcap input caps, transformerless, drives 150 Ω loads	\$1,500



# MICROPHONE & INSTRUMENT PREAMPS

Manufacturer	Product	Type	Channels	EQ	Output Level Control	Instrument/Line Input
Avalon Design	AD2022	100% discrete, pure Class A	2	Variable HP filter	Yes	Yes
Avalon Design	M5	100% discrete, pure Class A	1	Variable HP filter	Yes	Yes
Barcus-Berry	3500A	Solid state	1	Treble ( $\pm 2$ dB @ 10 kHz), bass ( $\pm 12$ dB @ 100 Hz)	No	Yes
BBE	386	Solid state	1	Parametric	Yes	Yes
Bellari	MP110 Direct Drive	Tube	1	N/A	Yes	Yes
Bellari	RP220	Tube	2	N/A	Yes	Yes
Bellari	RP520	Tube	2	N/A	Yes	Yes
Benchmark	Mic-Man Jr.	Solid state	2	N/A	No	No
Benchmark	MPS-400	Solid state	4	N/A	No	No
beyerdynamic	Mike Man	Solid state	2	N/A	No	No
beyerdynamic	MV100	Solid state	2	HP filter (120 Hz)	No	No
beyerdynamic	ProMike	Solid state	2	N/A	No	No
Bryston	BMP-2	Solid state	2	N/A	Yes	Yes
CLM	DB400S	Solid state	4	Low-cut filter	No	Yes
Crane Song	Flamingo	Discrete Class A	2	6-66 dB steps	Yes	No
Crookwood	Headless Paintpot	Solid state	2	HP filter, LF/HF	Yes	No
Crookwood	Hi Voltage Paintpot	Solid state	2	HP filter, LF/HF	Yes	No
Crookwood	Mic Bricks	Solid state	2-32 (modular)	HP filter, LF/HF	Yes	Yes
Crookwood	Paintpot	Solid state	2	HP filter, LF/HF	Yes	No
Crookwood	Rackpot	Solid state	4	HP filter	Yes	Yes
D.W. Fearn	VT-1/VT-2 Vacuum Tube Microphone Preamplifier	Tube	1/2	N/A	Yes	No
Demeter	H MP-1 Stereo Tube Microphone Preamp	Tube	2	Low-cut filter	Yes	Yes (2)
Demeter	VTBP-201 DBL Tube Bass Preamp	All tube	1	Treble, mid, bass (w/selectable frequency) presence	No	Yes (2)
Demeter	VTMP-2b Stereo Tube Microphone Preamp	Solid state	2	Low-cut filter	Yes	Yes (2)
Demeter	VTMP-2bx Stereo Tube Microphone Preamp	Tube	2	Low-cut filter	Yes	Yes (2)
Desert Island	Tubular	Tube	1	3-band, 20 Hz-20 kHz I.C. w/bypass	Yes	Yes
Drawmer	1962	Solid state/tube with 24-bit digital output	2	3-band per channel	Yes	Yes
Earthworks	LAB102/LAB101	Solid state	2/1	N/A	Yes	No
Event Electronics	EMP-1	Solid state	1	HP filters (switchable)	No	No
Fishman	Acoustic Blender/Acoustic Bass Blender	Solid state	2	Active shelving style; bass, treble, low-cut filter	Yes	Yes
Fishman	Model G/Model B	Solid state	1	Active shelving style; bass, treble	Yes	Yes
Fishman	Pocket Blender	Solid state	2	Active shelving style; bass, treble, high/low-cut filters	Yes	Yes
Fishman	Pro EQ	Solid state	1	4-band graphic (bass, mid, treble, brilliance)	Yes	Yes
Focusrite	Red 6	Solid state	1	4-band; fully parametric mids	Yes	No

# Overload Warning

# Frequency Response

# Noise

# Total Harmonic Distortion

# Special Features

# Price

N/A	(1 Hz–120 kHz transformer limit)	-126 dB EIN	0.05%	Ext B2T power supply (100/240V); polarity, 20 dB pad, DI in, optional balanced JT-1 output transformer; optional B&K 130V phantom power	\$3,000
Analog VU; (2) signal peak LEDs	(5 Hz–120 kHz transformer limit)	-126 dB EIN	0.05%	Ext B2T power supply (100/240V); polarity, 20 dB pad, DI in, optional B&K 130V phantom power	\$1,600
N/A	N/A	100 dB	0.005%	Internal gain up to 12 dB, 1,000 hrs batt life, compat w/all types of piezo P/Us	\$129
N/A	5 Hz–30 kHz	-95 dBu	0.04%	BBE process	\$299
Clip LED	40 Hz–40 kHz	90 dB S/N	0.1%	Transformer-balanced inputs, phase, pad	\$230
5-segment LED, clip LED	20 Hz–40 kHz	107 dB S/N	0.1%	Transformer-balanced inputs, phase, pad	\$500
Clip LED	20 Hz–40 kHz	107 dB S/N	0.1%	Analog VU meters; transformer-balanced inputs; phase, pad	\$600
N/A	1 Hz–300 kHz	1 dB noise figure	0.001%	Portable AC/DC operation; gain range 26 to 76 dB	\$425
N/A	1 Hz–500 kHz	1 dB noise figure; EIN -130 dBu	0.009%	Active bal I/O, phantom, max output level +27 dBu; gain range -2 to +73 dB (w/pad)	\$1,095
10-segment LED	20 Hz–90 kHz	83.18 dB S/N	0.0005%	Dual-channel microphone preamp for recording	\$699
Clip LED	18 Hz–22 kHz	-128 dB EIN	0.03%	Headphone monitoring	\$799
Peak LED	20 Hz–90 kHz	-129 dB EIN	0.0005%	Phantom, optical input transformers, bar-graph indicators	\$1,399
Peak LED	20 Hz–20 kHz	-125 dB EIN	0.05%	Fully balanced pure Class A, fully discrete circuitry	\$2,500
10-segment LED per channel	20 Hz–20 kHz	128 dB	0.006%	Phant, limiter, mid and side with stereo width management	\$2,199
(2) 23-segment LED w/clip indicator	5 Hz–200 kHz	-129 dBm EIN S/N	0.0006%	Phantom, sel "Fat" and "Iron" amps; emulates vintage sounds and creates new ones	\$2,025
LED with adjustable threshold	0 Hz–500 kHz	-130 dB EIN	0.001%	Portable, remote control only, MS decoders; input impd adj; high-current line drivers	\$2,495
LED with adjustable threshold	0 Hz–500 kHz	-130 dB EIN	0.001%	Portable, stand-alone and remote control; sep in for 130V B&K mics; MS decoders; input imp adj; high-current line drivers	\$3,395
LED with adjustable threshold	0 Hz–500 kHz	-130 dB EIN	0.001%	Modular, 3 rackspace, remote control only; input imp adj; high-current line drivers; distribution feeds, 24-bit AES/EBU out	(per chan) \$550
LED with adjustable threshold	0 Hz–500 kHz	-130 dB EIN	0.001%	Portable, stand-alone or remote control; MS decoders; input imp adj; high-current line drivers	\$2,995
LED with adjustable threshold	0 Hz–500 kHz	-130 dB EIN	0.001%	1 rackspace; remote control only; input imp adj; high-current line drivers; opt 24-bit AES/EBU outs	\$3,295
VU meter	5 Hz–28 kHz	-122 dBu EIN	0.2%	Phantom, phase, 20 dB pad; low imp in for transformerless mics	(V7-1) \$2,000 (V7-2) \$3,500
10-segment LED	10 Hz–80 kHz	-124 EIN	0.012%	Jensen input transformer; phase, LC; pad; vari tube gain	\$1,295
N/A	N/A	N/A	N/A	Jensen DBE mic level output transformers; effects loop; balanced out	\$799
LED	10 Hz–40 kHz	-124 dB EIN	0.016%	Jensen input transformers; phase, LC; pad; vari tube gain	\$2,299
LED	10 Hz–40 kHz	-124 dB EIN	0.016%	Phantom, Jensen in/out transformers; phase, ILC; pad; vari tube gain	\$2,549
Clip LED	N/A	N/A	N/A	1 rackspace; mic pre-tube midstage; mic/line and instr input (use all in-line via master)	\$699
Yes (with limiter)	0 Hz–35 kHz	-128.5 dB @ 60 dB of gain	<0.01%	TDIF, Lightpipe, XLR I/O, AES/EBU, S/PDIF outs, spectral enhancement; Tube Drive, 2-ch mixer, 3 str inserts; adjustable word length; dither, bit splitting	(analog) \$2,699 (TDIF, ADAT) \$4,999
N/A	2 Hz–100 kHz (@ ±0.1 dB)	-125 dBv EIN @ 20 dB of gain, -133 dBv @ 40 dB gain	N/A	Multiple outs per channel; phase; phantom; standby	(LAB102 dual) \$1,500 (LAB101 mono) \$750
Clip LED	20 Hz–20 kHz (@ ±0.1 dB)	122 dB S/N	0.02%	Internal power supply; extruded aluminum case; phase; phantom; signal-present LED	\$299
N/A	20 Hz–20 kHz	81 dB (A-weighted, ref to nom -20 dBV input)	0.2%	Sep mic/piezo transducer channels w/dedicated effects loops/phase; phantom	\$459.95
N/A	20 Hz–20 kHz	N/A	N/A	Optimized for piezo-electric transducers	\$139.95
N/A	20 Hz–20 kHz	87 dB (A-weighted, ref to nom -20 dBV input)	0.7%	Sep mic/piezo transducer channels w/dedicated effects loops/phase rev; phantom	\$379.95
N/A	20 Hz–20 kHz	N/A	N/A	Optimized for piezo-electric transducers; phase; sub-bass rolloff	\$179.95
VU meter	10 Hz–140 kHz	-128 dB EIN	0.003%	Separate in/out switching for filters/EQ, phantom, phase; output fader	\$2,995



# MICROPHONE & INSTRUMENT PREAMPS

Manufacturer	Product	Type	Channels	EQ	Output Level Control	Instrument/Line Input
Focusrite	Red 7	Solid state	1	Low-cut	Yes	No
Focusrite	Red 8	Solid state	2	N/A	Yes	No
GML	8300	Solid state	2	N/A	No	No
Giltronics	2TMP	Tube/transformer in and out	2	N/A	Yes	No
Giltronics	356AT Mic/Line Preamp	All tube	4 (2 mic/2 line)	N/A	Yes	Yes
Giltronics	4 TMP Tube Mic Preamp	All tube	4	N/A	Yes	No
Grace Design	Lunatic V2	Solid state	2	HP filter (75–150 Hz, 6–12 dB/oct)	Yes	No
Grace Design	Model 201	Solid state	2	N/A	Yes	Yes
Grace Design	Model 801	Solid state	8	N/A	Yes	No
Grace Design	Model 801R	Solid state	8	N/A	No	No
HMB	Classic 80	Pentode tube	2	High-cut (5, 10, 15 kHz); low-cut (60, 100, 150 Hz)	Yes	Yes
HMB	Radius 10	Tube	4	(4x) HP filter, low-cut (90 Hz)	Yes	No
HMB	Radius 50	Tube	1	HP filter, low-cut (90 Hz)	Yes	No
Independent Audio	Calrec RQP 4400	Solid state	4 (stereo)	LF filter (18 dB/oct) 47, 82, 150 Hz switch for each channel, HF filter (12 dB/oct)	No	No
Independent Audio	DACS Ltd. MicAmp	Discrete	2	Bass rolloff	No	No
Langevin	Dual Mono Mic Pre	Solid state	2	High and low shelving	No	Yes
Lexicon	Signature 284 All-Tube Class "A" Stereo Recording Amplifier & Direct Source	Tube (Class A)	2	Bass, mid, treble, presence	Yes	Yes
Manley Labs	Dual Mono 40 dB	Tube	2	N/A	No	Yes
Manley Labs	Mic EQ 500	Tube	1	Stepped LF and HF, passive vintage EQ	Yes	Yes
Manley Labs	Mono 40 dB	Tube	1	N/A	No	Yes
Martech	MSS-10 Microphone Preamplifier	Solid state	1	N/A	Yes	Yes
Midiman	Audio Buddy	Solid state	2	N/A	No	Yes
Millennia Media	HV-3B	Solid state	2	N/A	Yes	No
Millennia Media	HV-3D	Solid state	8	N/A	Yes	No
Millennia Media	Quad	Solid state	4	N/A	Yes	No
Nightpro	PreQ3	Solid state	2 or 4	1-band (selectable frequency), broad-band shelving, LF rolloff	No	Yes
Oram Pro	Octasonic	Solid state	8	N/A	No	Yes
Peavey	VMP-2	Tube	2	2-band, 40/80 Hz low-cut	Yes	Yes
Pendulum	MDP-1	Tube, Class A	2	10-position low-cut filter (20–180 Hz)	Yes	Yes
Joemeek	VC1 Studio Channel	Solid state	1	Enhancer, HP filter	Yes	Yes
Precision Analog Systems	MPA 100	Solid state	2	N/A	Yes	No
PreSonus	M80 and MP20	Class A discrete	2 (MP20) or 8 (M80)	Low-cut filter	Yes	Yes

# Overload Warning

# Frequency Response

# Noise

# Total Harmonic Distortion

# Special Features

# Price

VU meter	10 Hz–140 kHz	-128 dB EIN	0.006%	Full dynamics processor with in/out switching, phantom; phase; output fader	\$2,995
VU meter	10 Hz–140 kHz	128 dB EIN	0.003%	Phantom/phase on each channel	\$2,495
Clip LED	1 Hz–20 kHz	-127 dBu EIN	0.0008%	Phantom; 1 rackspace; can be upgraded to 4 channels for \$1,200	\$2,195
N/A	20 Hz–20 kHz	-73 dB S/N, -123 dB EIN	0.05%	20 dB pad, phase, -10 dB input sensitivity switch, 120/240 AC, phantom	\$2,100
N/A	20 Hz–20 kHz	-73 dB S/N, -123 dB EIN	0.05%	Can link mic pre to line, can use mic pre's and line amps separately; Reichenbach transformers in/out all 4 chs, 120/230 VAC	\$3,495
N/A	20 Hz–20 kHz	-73 dB S/N, -123 dB EIN	0.05%	Phantom; 120/230 VAC; -20 dB pad; -10 dB sensitivity switch; Reichenbach in/out transformers	\$3,600
2 level, full wave signal peak indicators	6 Hz–250 kHz (@ ±3 dB @ 60 dB gain)	<-130 dB @ 60 dB gain 50 Ω source	0.0011%	For field recording, operates on 6–12 VDC	\$1,495
2 level, full wave signal peak indicators	4.5 Hz–1.0 MHz (@ ±3 dB @ 40 dB gain)	<-130 dB @ 60 dB gain 50 Ω source	0.0015%	Transpedance architecture	\$1,895
2 level, full wave signal peak indicators	4.5 Hz–1.0 MHz (@ ±3 dB @ 40 dB gain)	<-130 dB @ 60 dB gain 50 Ω source	0.001%	Transpedance architecture	\$4,495
Full metering	4.5 Hz–1.0 MHz (@ ±3 dB @ 40 dB gain)	<-130 dB @ 60 dB gain 50 Ω source	0.0015%	Fully remote control; up to 64 chans control from 1 desktop controller; scene mem/recall; full MIDI control	\$5,495 (controller) \$995
Drive/peak indicators	30 Hz–40 kHz	-122 dBw EIN	0.05%		\$1,850
Drive/peak LEDs	10 Hz–40 kHz	-127 dBw EIN	N/A	Phantom, phase per channel	\$749
8-segment LEDs	10 Hz–40 kHz	-127 dBw EIN	N/A	Phantom	\$469
Overload LED indicator (4 dB before clipping)	20 Hz–20 kHz	-90 dBu RMS	0.01%	M/S conversion switchable each stereo input	\$3,360
N/A	20 Hz–55 kHz	-133 dB	0.002%	Phantom	\$2,150
N/A	10 Hz–20 kHz	80 dB S/N	0.05%	All discrete	\$1,475
N/A	N/A	N/A	N/A	Preamp uses 3 12AX7 tubes; amp uses 2 EL84 tubes; stereo effects loop; speaker outs for 8/4 Ω grt cabs; built-in speaker loads	\$1,099
N/A	10 Hz–60 kHz	80 dB S/N	0.05%	High headroom; high accuracy	\$2,400
VU meter	5 Hz–60 kHz	100 dB S/N	0.025%	Fully differential circuitry	\$2,900
N/A	10 Hz–60 kHz	80 dB S/N	0.05%	High headroom; high accuracy	\$1,600
VU	10 Hz–20 kHz (@ 20 dB gain @ -0.0/+0.5); 10 Hz–20 kHz (@ 65 dB gain @ -0.0/+0.5)	-129.5 dBu (typical)	<-0.0015%		\$2,250
Yes	5 Hz–50 kHz	-122 dBu	0.1%		\$119.95
Clip LED	1 Hz–300 kHz	-129 dB EIN	0.001%	Fully balanced; B&K mic option	\$1,895
Clip LED	1 Hz–300 kHz	-129 dB EIN	0.001%	Fully balanced; B&K mic option	\$3,995
Clip LED	1 Hz–300 kHz	-129 dB EIN	0.001%	Fully balanced	\$2,895
Peak LED	15 Hz–40 kHz	-126 dBu EIN	0.003%	Vari Air air-band EQ	(2 channels) \$1,595 (4 channels) \$2,595
Precip LED	20 Hz–40 kHz	-127.5 dB EIN	0.005%	Phase; phantom per ch; alum knobs; 2 high-level inputs	\$1,795
N/A	10 Hz–40 kHz	-126 dBu EIN	0.04%	20 dB pad; phantom; EQ bypass; input transformer with triple magnetic shielding	\$949.99
VU	5 Hz–300 kHz	-125 dBu EIN	0.03%	All tube signal path; transformerless out; fully regulated power supply w/soft-start warmup; phase; -20 dB pad	\$2,495
VU	20 Hz–20 kHz	-125.5 dB	0.02%	Phant; photo-optical compressor	\$999
Clip LED	5 Hz–180 kHz	-127 dB EIN	0.009%	Pure Class A operation; 100% discrete	\$2,195
Clip LED	10 Hz–30 kHz	<-127.5 dB	0.001–0.5%	Jensen input transformers; twin servo gain stage; mix bus assign for multiple mic/instr stereo imaging, IDSS control; headphone amp	(M80) \$1,999.95; (MP20) \$649.95



# MICROPHONE & INSTRUMENT PREAMPS

Manufacturer	Product	Type	Channels	EQ	Output Level Control	Instrument/Line Input
Radio Design Labs	RU-MP2	Solid state	2	N/A	Yes	No
Radio Design Labs	RU-MX5	Solid state	5	N/A	Yes	No
Radio Design Labs	ST-MLX3	Solid state	3	N/A	Yes	No
Radio Design Labs	ST-MMX3	Solid state	3	N/A	Yes	No
Radio Design Labs	ST-VCA1	Solid state	1	N/A	Yes	Yes
Radio Design Labs	STM-1	Solid state	1	N/A	No	No
Radio Design Labs	STM-2	Solid state	1	N/A	Yes	No
Radio Design Labs	STM-2X	Solid state	1	N/A	Yes	No
Radio Design Labs	STM-3	Solid state	1	N/A	Yes	No
Rane	DMS22	Solid state	2	3-band w/sweepable parametric mid	Yes	No
Rane	MS1	Solid state	1	N/A	Yes	No
Sennheiser	True Audio Precision 8	Solid state	8	N/A	No	Yes (2)
Studio Technologies	Mic-PreEminence	Solid state	2	N/A	Yes	No
Summit Audio	MP4X	Class A, transformer-coupled balanced output	4	HP/LP filters (12 or 24 dB/oct)	Yes	Yes
Summit Audio	MPC-100A	Tube/solid-state hybrid	1 (stereo linkable with another MPC)	N/A	Yes	Yes
Summit Audio	TPA-200B	Tube	2	N/A	Yes	Yes
Symetrix	302	Solid state	2	N/A	Yes	No
Sylek	E04X-1M	Solid state	1	4-band parametric	Yes	Yes
Sylek	MPX-4A	Solid state	4	N/A	Yes	No
Sylek	MPX-4A 2	Solid state	4	N/A	Yes	No
Sylek	MPX-4D	Solid state	4	N/A	Yes	No
TC Electronic	1140 Parametric Equalizer (Mic Preamp)	Solid state	1	2-band parametric	Yes	Yes
TC Electronic	MP-1A	Solid state	N/A	+20 dB to +70 dB in 5 dB steps	No	Yes
Tech 21	SansAmp Classic	FET solid state	1	Active high-cut filter	Yes	Yes
Tech 21	SansAmp GT2	FET solid state	1	Active low/high	Yes	Yes
Tech 21	SansAmp PSA-1	FET solid state	1	Active low/high	Yes	Yes
Tech 21	TRI-O-D	FET solid state	3	Active low/high	Yes	Yes
The John Hardy Co.	Jensen Twin Servo 990	Solid state	1-4 (expandable)	N/A	No	No
The John Hardy Co.	M-1	Solid state	1-4 (expandable)	N/A	No	No
The John Hardy Co.	M-2	Solid state	1-4 (expandable)	N/A	No	No
TL Audio	PA5001	Tube	4	Low-cut filter (90 Hz)	Yes	No
Whirlwind	MD-1	Solid state	1	N/A	Yes	Yes
Yamaha	HA8	Solid state	8	N/A	No	Yes
Yamaha	MLA7	Solid state	8	N/A	No	Yes
Zefiro Acoustics	Zefiro In Box (Preamp)	Solid state	2	N/A	No	Optional (RCA)

# Overload Warning

# Frequency Response

# Noise

# Total Harmonic Distortion

# Special Features

# Price

N/A	25 Hz–20 kHz	75 dB S/N	0.050%	Compatible with RDL rack-mounting accessories; phantom	\$308
3-segment LED	70 Hz–30 kHz	70 dB S/N	0.030%	5-channel active line mixer/mic pre with phantom	\$255
N/A	10 Hz–18 kHz	70 dB S/N	0.2%	Small size (about 0.5x1.5x3"); individual gain adjustment; mic/line mix	\$124
N/A	10 Hz–18 kHz	70 dB S/N	0.2%	Small size (about 0.5x1.5x3"); indiv gain adjustment	\$130
N/A	20 Hz–22 kHz	80 dB S/N	0.05%	Small size (about 0.5x1.5x3"); cntrl via extnl potentiometer or 0–10 VDC	\$116
N/A	50 Hz–30 kHz	70 dB S/N	0.05%	Small size (about 0.5x1.5x3"); phantom; fixed gain of 50 dB	\$99
N/A	50 Hz–25 kHz	75 dB S/N	0.05%	Small size (about 0.5x1.5x3"); phantom; adjustable gain	\$136
N/A	50 Hz–25 kHz	75 dB S/N	0.05%	Small size (about 0.5x1.5x3"); gating preamp via external control; phantom	\$153
N/A	50 Hz–25 kHz	70 dB S/N	0.05%	Small size (about 0.5x1.5x3"); phantom; adjustable gain	\$156
Clip LED	20 Hz–200 kHz	97 dB S/N	0.009%	Stereo with pan; phantom	\$549
Clip LED	20 Hz–20 kHz	102 dB S/N	0.007%	Phantom	\$199
(8) 5-segment LED and peak	1 Hz–500 kHz (@ 0–3 dB)	-132 dB EIN (20 Hz–30 kHz)	0.008%	MS decoding on Chs 1 and 2	\$2,695
5-segment LED	20 Hz–60 kHz	69.5 dB S/N -129.5 dB EIN	0.002%	Transformerless; balanced in; bal/unbal outputs; phantom; phase; single rackspace	\$799
(4) 12-segment LED meters and clip indicator	10 Hz–100 Hz (@ 0.5 dB)	-128 dBm EIN	0.0025%	25 presets; MIDI; multitrack linking; 1 kΩ input imp for min mic loading	\$4,495
Clip LED, VU meter	5 Hz–65 kHz	-84 dBu, 108 dB S/N	0.05%	"Clean" to "saturated" valve sounds; Jensen mic transformer; +4 dBu/-10 dBV outs	\$2,400
Clip LEDs (input and output)	10 Hz–20 kHz	-84 dBu, 108 dB S/N	0.02%	Continuously variable from "clean" to "overdrive"; bal output; Hi-Z in; pad; phase	\$2,695
Clip LED	20 Hz–20 kHz	95 dB S/N, -128 dBm EIN	0.007%	L/R mix output	\$299
Peak LED	10 Hz–85 kHz	96 dBm S/N, -129 dBu EIN	0.0015%	Class A hybrid	\$1,460
Peak LED	10 Hz–85 kHz	96 dBm S/N, -129 dBu EIN	0.0015%	Class A hybrid	\$1,280
Peak LED	10 Hz–85 kHz	96 dBm S/N, -134 dBu EIN	0.0015%	Class A hybrid	\$1,480
Peak LED	10 Hz–85 kHz	96 dBm S/N, -129 dBu EIN	0.0015%	Class A hybrid	\$1,870
Overload LED	N/A	N/A	N/A		\$760
N/A	N/A	N/A	N/A	Phantom; 1/4" XLR mic inputs	\$2,395
N/A	Setting dependent	Setting dependent	Setting dependent	Tube amp emulations for rec; multiple preamp styles; 8 character switches/knbs; contour, vol, final tone cntrls	\$345
N/A	Setting dependent	Setting dependent	Setting dependent	Streamlined version of SansAmp Classic; selectable amp type, mod, spkr cab/mic placement configurations	\$195
N/A	Setting dependent	Setting dependent	Setting dependent	Prog tube amp emulations; buzz, punch, crunch, drive, level cntrls; 49 factory presets; 49 user locations	\$795
N/A	Setting dependent	Setting dependent	Setting dependent	3 preset SansAmp voicings (Tweed, California, British) for direct recording; drive/level cntrls each ch; spkr simulator	\$245
20-segment LED, clip LED	N/A	N/A	N/A	2 discrete op amps per ch (990C); Jensen in/out transformers (JT-16-B, JT-11-BMQ); no caps in signal path	\$1,550–\$4,250
20-segment LED, clip LED	N/A	N/A	N/A	990 discrete op amp; Jensen JT-16-B input transformer; no capacitors in signal path	\$875–\$2,905
20-segment LED, clip LED	N/A	N/A	N/A	990 discrete op amp; Jensen JT-16-B input transformer; no capacitors in signal path	\$920–\$3,085
Peak LED	20 Hz–40 kHz	-127 dBu EIN	0.05%	4 12AX7 tubes; 2 tube stages per ch	\$699
N/A	6 Hz–25 kHz	-123 dB EIN	0.05%	Headphone amp with vol cntrl/minimixer; batt oper w/belt clip; phantom	\$399
Peak LED	20 Hz–40 kHz	-128 dB EIN	0.05%	Phantom; signal present LED; remote-control capable	\$1,779
Peak LED	20 Hz–20 kHz	-128 dB EIN	0.1%	Phantom	\$599
N/A	10 Hz–21 kHz	99 dB S/N (A/D)	0.008%	20-bit A/D, S/PDIF optical/coax out	\$295



# CHANNEL STRIPS & VOICE PROCESSORS

Manufacturer	Model	# of Channels/ Stereo Link	Mic Pre Types	Analog I/O	Digital I/O	EQ Type	Filters	Compressor Type	Expander	Gate	De-Esser	Sidechain
A.R.T.	Pro Channel	1/No	Tube	XLR; 1/4"	N/A	4-band parametric w/sweepable mids	HP variable	Optical tube/variable mu (switchable)	No	No	No	No
A.R.T.	Tube Channel	1/No	Tube	XLR; 1/4"	N/A	4-band parametric w/sweep mids	N/A	Optical tube	No	No	No	No
ATI	Pro6 Audio Processor	1/Yes	High-voltage solid-state	XLR	N/A	4-band parametric	Tunable HP/LP (24 dB/octave)	RMS	No	Yes (parametric noise gate)	No	Yes
Avalon Design	VT-737SP	1/Yes	Discrete Class A tube	XLR and 1/4" in; XLR out	N/A	4-band active/passive parametric (15 Hz–32 kHz)	HP, low-cut	Optical, Class A tube	No	No	No	Yes
Barbetta	Channel One	1/No	Solid-state	XLR and 1/4" TRS in; XLR out	N/A	3-band parametric	Subsonic	Full function	No	Yes	No	No
BSS Audio	FCS 916	1/No	Solid-state	XLR and 1/4" TRS in; XLR out	N/A	4-band fully parametric	HP, LP	N/A	No	No	No	No
dbx	1086	1/No	Solid-state	XLR; 1/4" TRS	Optional	2-band detail	Low-cut	OverEasy; hard knee	Yes	Yes	Yes	No
dbx	286A	1/No	Solid-state	XLR; 1/4" TRS	N/A	2-band enhancer	HP	OverEasy	Yes	Yes	Yes	Yes
dbx	586	2/No	Tube	XLR; 1/4" TRS	Optional	3-band sweep mid; adjustable Q	Low-cut	PeakPlus limiter	No	No	No	Yes
Drawmer	MX60 Front End One	1/No	Solid-state	XLR; 1/4" TRS	N/A	3-band high/low shelving; center parametric	HP 100 Hz low-cut	VCA; soft knee	No	Yes	Yes	No
HBB	Radius 40	1/Yes	Solid-state/tube hybrid	XLR; 1/4"	N/A	4-band parametric	HP @ 90 Hz	Analog	Yes	Yes	No	Yes
LA Audio	MPX1 Mono Multi-Processor	1/No	Solid-state	XLR; 1/4" TRS	N/A	4-band w/sweep high/low; 2 parametric mids	HP @ 75 Hz; LP @ 12 kHz	Solid-state	Yes	No	Yes	No
LA Audio	PS1 Professional Microphone Channel Strip	1/No	Solid-state	XLR; 1/4" TRS	Optional	4-band w/ sweep high/low; 2 parametric mids	HP @ 75 Hz; LP @ 12 kHz	Hard or soft knee (auto-sensing)	Yes	No	Yes	No
LA Audio	PS1D Professional Microphone Channel Strip with Digital Input	1/No	Solid-state	XLR; 1/4" TRS	24-bit A/D	4-band w/ sweep high/low; 2 parametric mids	HP @ 75 Hz; LP @ 12 kHz	Hard or soft knee w/variable rate; auto-sensing	Yes (variable threshold)	No	Yes (tunable)	No
Manley Labs	Manley VOXBOX	1/Yes	Tube	XLR; 1/4" TRS	N/A	Pultec	Low-cut	Optical	No	No	Yes	Yes
Oram Pro	MWS (Microphone Work Station)	2/No	Solid-state	XLR	N/A	4-band parametric (2 semi, and 2 quasi)	HP; LP	N/A	No	No	No	No
Joemeek	VC2 Tube Channel	1/Yes	Solid-state with tube-buffered output stage	XLR; 1/4" TRS	N/A	Enhancer	HP @ 80 Hz	Photoelectric	No	No	No	No
Joemeek	VC3 Pro Channel	1/No	Solid-state	XLR; 1/4" TRS	N/A	Enhancer	N/A	Photoelectric	No	No	No	No
PreSonus	VXP Dynamic Voice Processor	1/No	Class A	XLR; 1/4" TRS	N/A	4-band semi-parametric	HP	VCA, variable soft knee to hard limit	Yes	No	Yes	No
Rane	VP12	2/No	Solid-state	XLR; 1/4" TRS; screw terminals	N/A	2-band parametric	HP; LP	Solid-state	Yes	Yes	Yes	No
Steinberg	Mindprint EnVoice	1/No	Solid-state	1/4" instrument; XLR mic	Optional	3-band w/sweep mids	Low-cut on compressor	Tube w/soft knee	No	No	No	Yes
TC Electronic	Gold Channel	2/Yes	Digital	XLR	AES/EBU (XLR); S/PDIF (RCA, Toslink); ADAT (Toslink)	5-band parametric (96 kHz) w/analogue emulations	N/A	Digital	Yes	Yes	Yes	Yes

Bypass	Meter Type	Frequency Response	Dynamic Range	THD	Dimensions (Inches)	Weight	Special Features	Price
Yes	10-segment LED; VU	20 Hz–20 kHz	>100 dB	<0.1%	19x6.5x3.5	12 lbs	1/4" inserts between preamp and comp/comp and EQ; internal power supply; front panel power w/switch	\$799
Yes	LED; VU	20 Hz–20 kHz	>90 dB	<0.1%	19x5.25x1.75	8 lbs	1/4" inserts between preamp and comp/comp and EQ; VU metering; internal power supply; front panel power w/switch	\$499
Yes	(3) 10-segment LEDs	10 Hz–100 kHz	N/A	0.008%	1 rackspace	7 lbs	94 dB S/N, -129 dBm EIN; aux output pre/post -EQ or VCA; EQ pre/post-VCA	\$1,995
Yes	Large VU, 2 signal peak LEDs	1 Hz–200 kHz	-116 dB (22 Hz–22 kHz unweighted)	0.05%	19x12x3.5	22 lbs	4 vacuum tubes plus 100% discrete; pure Class A; EQ switch	\$2,295
Yes	VU meter; clip LED	3 Hz–20 kHz	>94 dB	0.0005%	19x9x1.7	6.5 lbs	Includes: mic pre and instrument pre; phantom	\$629
Yes	Peak LED	5 Hz–80 kHz	>90 dB	0.003%	19x8.6x1.75	7.7 lbs	Phantom; deep/narrow notch per filter; individual band bypass; LCD	\$999
Yes	LED; VU	5 Hz–180 kHz (@ ±3 dB)	119 dB	0.005%	1 rackspace	N/A	Phantom	\$749.95
Yes	LED	20 Hz–20 kHz (@ ±0.5 dB)	105 dB	0.005%	19x5.75x1.75	4.68 lbs	Phantom	\$349.95
Yes	VU LED	10 Hz–200 kHz (@ ±0.5 dB)	N/A	0.004%	19x8x3.5	12 lbs	Phantom; pad; phase	\$999.95
No	4-segment LED	10 Hz–36 kHz (@ ±1 dB)	134 dB	<0.05%	1 rackspace	N/A	20 dB pad; phantom; phase	\$629
Yes	VU	10 Hz–40 kHz	106 dB	N/A	19x7.9x3.5	5.5 lbs	I/O gain control; stereo link for connecting 2 Radius 40s	\$749
Yes	6-segment gain and output LEDs	20 Hz–20 kHz (@ ±1 dB)	N/A	<0.05%	19x6x1.75	4.8 lbs	Phantom; phase	\$399.95
Yes	12-segment LED	20 Hz–20 kHz (@ ±1 dB)	N/A	<0.05%	19x6x1.75	N/A	Phantom; phase	\$849.95
Yes	12-segment comp/output LED	20 Hz–20 kHz (@ ±1 dB)	N/A	<0.05%	19x6x1.75	N/A	Phantom; phase	\$1,149.95
Yes	VU	20 Hz–30 kHz	N/A	N/A	1 rackspace	N/A	Phantom; phase	\$4,000
Yes	10-segment LED; bar	20 Hz–20 kHz	N/A	0.005%	N/A	N/A	Phase; phantom; onboard power supply; unity gain; padless front end	\$2,195
Yes	VU	20 Hz–20 kHz	N/A	0.05%	14x7.5x3.5	8 lbs	Transformer at mic pre in; tube gain amplifier	\$1,999.99
No	5-segment LED	50 Hz–50 kHz		0.04%	14x7.5x3.5	4 lbs	Phantom	\$399.99
Yes	(3) 8-segment, (2) 4-segment LEDs	20 Hz–40 kHz	116 dB	0.005%	19x8x1.75	8 lbs	Jensen input transformer; phantom; 20 dB pad; peak limiter on output	\$699.95
Yes	6-segment LED; clip LED	20 Hz–20 kHz	N/A	0.01%	1 rackspace	N/A	Phantom; mic/line mix	\$599
Yes	(2) 12-segment LEDs	10 Hz–22 kHz (@ ±0.2 dB)	112 dB	0.04%	19x1.75x9.4	7.6 lbs	Optional digital I/O module; individual EQ bands have in/out switches; phantom	\$699
Yes	2x4-segment and 15-segment LEDs	10 Hz–20 kHz	103 dB	0.003%	1 rackspace	5.5 lbs	Digital radiance generator; time align; MS encode/decode; RIAA phono EQ	\$2,495



# POWER AMPS

Manufacturer	Model	Continuous Avg. Power Into 8 $\Omega$ (20 Hz–20 kHz $\pm$ 1 dB)	Continuous Avg. Power Into 4 $\Omega$ (20 Hz–20 kHz $\pm$ 1 dB)	Frequency Response	Signal- to-Noise	Total Harmonic Distortion	Damping Factor	Slew Rate
Alesis	RA-100	75W per channel	100W per channel	20 Hz–20 kHz	>100 dB	<0.05% @ 1 kHz	200 (ref 8 $\Omega$ )	20 V/ $\mu$ s
A.R.T.	SLA-150	100W per channel	150W per channel	20 Hz–50 kHz	>105 dB	<0.03%	>100	>25 V/ $\mu$ s
Ashly Audio	FTX-1001	120W per channel	175W per channel	20 Hz–100 kHz	>100 dB	0.007%	>250 @ <1 kHz (ref 8 $\Omega$ )	50 V/ $\mu$ s
Ashly Audio	FTX-1501	200W per channel	300W per channel	20 Hz–100 kHz	>100 dB	0.007%	>250 @ <1 kHz (ref 8 $\Omega$ )	50 V/ $\mu$ s
Ashly Audio	FTX-2001	300W per channel	500W per channel	20 Hz–100 kHz	>105 dB	0.007%	>250 @ <1 kHz (ref 8 $\Omega$ )	50 V/ $\mu$ s
Ashly Audio	GFT-1800	200W per channel	300W per channel	20 Hz–100 kHz	>100 dB	<0.05%	>250 @ <1 kHz (ref 8 $\Omega$ )	50 V/ $\mu$ s
Ashly Audio	MFA-6000	525W per channel	800W per channel	8 Hz–100 kHz	>105 dB	0.025%	>200 @ <1 kHz (ref 8 $\Omega$ )	25 V/ms
Ashly Audio	MFA-8000	750W per channel	1,200W per channel	8 Hz–100 kHz	>105 dB	0.025%	>200 @ <1 kHz (ref 8 $\Omega$ )	25 V/ms
Ashly Audio	SRA-120	45W per channel	60W per channel	20 Hz–20 kHz	100 dB	<0.01%	>200 @ <1 kHz (ref 8 $\Omega$ )	<10 V/ $\mu$ s stereo, >20 V/ $\mu$ s mono
Audio Centron	RMA1601	250W per channel	425W per channel	20 Hz–20 kHz	>100 dB	<0.15%	250	40 V/ $\mu$ s
Audio Centron	RMA1650	250W per channel	425W per channel	20 Hz–20 kHz	>100 dB	<0.15%	N/A	40 V/ $\mu$ s
BGW Systems	Millennium Series 1	110W per channel	165W per channel	8 Hz–150 kHz 20 or 40 Hz–150 kHz (selectable)	>100 dB	<0.1%	>200 (ref 8 $\Omega$ )	>40 V/ $\mu$ s
BGW Systems	Millennium Series 2	220W per channel	330W per channel	8 Hz–150 kHz 20 or 40 Hz–150 kHz (selectable)	>100 dB	<0.1%	>200 (ref 8 $\Omega$ )	>40 V/ $\mu$ s
BGW Systems	Millennium Series 3	330W per channel	500W per channel	8 Hz–150 kHz 20 or 40 Hz–150 kHz (selectable)	>100 dB	<0.1%	>200 (ref 8 $\Omega$ )	>40 V/ $\mu$ s
BGW Systems	Performance Series 1	110W per channel	165W per channel	8 Hz–175 kHz	>100 dB	<0.1%	>200 (ref 8 $\Omega$ )	>40 V/ $\mu$ s
BGW Systems	Performance Series 2	220W per channel	330W per channel	8 Hz–175 kHz	>100 dB	<0.1%	>200 (ref 8 $\Omega$ )	>40 V/ $\mu$ s
BGW Systems	Performance Series 3	330W per channel	500W per channel	8 Hz–175 kHz	>100 dB	<0.1%	>200 (ref 8 $\Omega$ )	>40 V/ $\mu$ s
BGW Systems	Performance Series 4	440W per channel	660W per channel	8 Hz–175 kHz	>100 dB	<0.1%	>200 (ref 8 $\Omega$ )	>40 V/ $\mu$ s
Bryston	2-B-LP-Pro	70W per channel	120W per channel	0.5 Hz–100 kHz	>100 dB	<0.01%	>500 @ 20 Hz (ref 8 $\Omega$ )	>60 V/ $\mu$ s
Bryston	3B-ST Pro	150W per channel	250W per channel	<1 Hz–100 kHz	>106 dB	<0.007%	>500 @ 20 Hz (ref 8 $\Omega$ )	>60 V/ $\mu$ s
Bryston	4B-ST Pro	300W per channel	500W per channel	<1 Hz–100 kHz	>106 dB	<0.007%	>500 @ 20 Hz (ref 8 $\Omega$ )	>60 V/ $\mu$ s
Bryston	5B-ST Pro 3-channel	150W per channel	250W per channel	<1 Hz–1 kHz	>106 dB	<0.007%	>500 @ 20 Hz (ref 8 $\Omega$ )	>60 V/ $\mu$ s
Bryston	7B-ST Pro Mono Block	600W per channel	900W per channel	<1 Hz–100 kHz	>106 dB	<0.007%	>300 @ 20 Hz (ref 8 $\Omega$ )	>60 V/ $\mu$ s
Bryston	8B-ST Pro 4-channel	150W per channel	250W per channel	<1 Hz–100 kHz	>106 dB	<0.007%	>500 @ 20 Hz (ref 8 $\Omega$ )	>60 V/ $\mu$ s
Bryston	9B-ST Pro 5-channel	150W per channel	250W per channel	<1 Hz–1 kHz	>106 dB	<0.007%	>500 @ 20 Hz (ref 8 $\Omega$ )	>60 V/ $\mu$ s
Bryston	Power Pac 120 Mono Amp	150W per channel	250W per channel	<1 Hz–>1 kHz	>106 dB	<0.007%	>500 @ 20 Hz (ref 8 $\Omega$ )	>60 V/ $\mu$ s
Bryston	Power Pac 60 Mono Amp	60W per channel	120W per channel	<1 Hz–>1 kHz	>106 dB	<0.007%	>500 @ 20 Hz (ref 8 $\Omega$ )	>60 V/ $\mu$ s
Carver Professional	ca400	130W per channel	200W per channel	20 Hz–20 kHz	>100 dB	<0.1%	>200	10 V/ $\mu$ s
Carver Professional	ca900	325W per channel	450W per channel	20 Hz–20 kHz	>100 dB	<0.1%	>200	40 V/ $\mu$ s (bandwidth limited)
Carver Professional	pm125	50W per channel	62W per channel	20 Hz–20 kHz	>100 dB	<0.1%	<400	10 V/ $\mu$ s
Carver Professional	pm1400	475W per channel	700W per channel	20 Hz–20 kHz	>100 dB	<0.1%	<400	40 V/ $\mu$ s
Carver Professional	pm420	135W per channel	210W per channel	20 Hz–20 kHz	>100 dB	<0.1%	<400	10 V/ $\mu$ s
Carver Professional	pm700	225W per channel	350W per channel	20 Hz–20 kHz	>100 dB	<0.1%	<400	40 V/ $\mu$ s (bandwidth limited)

Power Consumption	Protection Features	AC Circuit Breaker	Ground Lift	Indicator Lights	Dimensions (Inches)	Weight (lbs.)	Price
500W (max)	Short circuit; thermal overload; DC offset; RF; open circuit; sft clppng; on/off transient	No	No	Clip	19x3 5x8	14.25	\$379
600W	Short circuit; overload; delayed turn on	No	No	Yes	19x3 5x11	18	\$329
425W (max), 6A	Short circuit; thermal overload; DC offset; RF	No	Yes	11-seg LED meters; protect LEDs	19x3 5x16.5	37	\$739
760W, 8A	Short circuit; thermal overload; DC offset; RF	No	Yes	11-seg LED meters; protect LEDs	19x3 5x16.5	41	\$839
1,350W, 12A	Short circuit; thermal overload; DC offset; RF	No	Yes	11-seg LED meters; protect LEDs	19x5 25x16.5	53	\$1,049
760W, 8A	Short circuit; thermal overload; DC offset; RF	No	Yes	11-seg LED meters; protect LEDs	19x3 5x15.75	37	\$849
1,800W (max), 18A	Short circuit; thermal overload; DC offset; RF	No	Yes	11-seg LED mtrs; limit/thermal/protect LEDs	19x5 25x16.5	54	\$1,799
3,000W (max), 20A	Short circuit; thermal overload; DC offset; RF	No	Yes	11-seg LED mtrs; limit/thermal/protect LEDs	19x5 25x16.5	61	\$2,299
350W (max)	Short circuit; thermal overload; DC offset; RF	No	Yes	Signal present/clip/protect LEDs	19x1 75x10	18	\$469
N/A	Short circuit; RF; spkr out relays; trn on/off transient; thermal DC	No	No	No	19x 3.5x16.75	36	\$599.99
N/A	Short circuit; RF; spkr out relays; trn on/off transient; thermal DC	Yes	No	No	19x3 5x16.75	36	\$699.99
350W	Short circuit; RF; spkr out relays; trn on/off; thermal DC; instant shut-off	No	Yes	Clip; power; signal present	19x5 25x12.8	28	\$749 (w/trnsfrms) \$899
480W	Short circuit; RF; spkr out relays; trn on/off; thermal DC; instant shut-off	No	Yes	Clip; power; signal present	19x5 25x12.8	34	\$899 (w/autofrms) \$1,057
675W	Short circuit; RF; spkr out relays; trn on/off; thermal DC; spkr prtct; instant shut-off	No	Yes	Clip; power; signal present	19x5 25x15.4	40	\$1,259 (w/autofrms) \$1,417
350W	Short circuit; RF; spkr out relays; trn on/off; thermal DC; spkr prtct; instant shut-off	No	Yes	Clip; power; signal present	19x3 5x12.6	26	\$849
480W	Short circuit; RF; spkr out relays; trn on/off; thermal DC; spkr prtct; instant shut-off	No	Yes	Clip; power; signal present	19x3 5x12.6	32	\$999
675W	Short circuit; RF; spkr out relays; trn on/off; thermal DC; spkr prtct; instant shut-off	No	Yes	Clip; power; signal present	19x3 5x13.6	37	\$1,399
1,100W	Short circuit; RF; spkr out relays; trn on/off; thermal DC; spkr prtct; instant shut-off	No	Yes	Clip; power; signal present	19x3 5x17.1	54	\$1,999
15–250W	Short circuit; RF; thermal; DC offset	No	Yes	Tricolor LED	19x1 75x10	18	\$995
30–500W	Short circuit; RF; thermal; DC offset	No	Yes	Tricolor LED	19x5 25x9	22	\$1,650
50–1,000W	Short circuit; RF; thermal; DC offset	No	Yes	Tricolor LED	19x5 25x15.5	42	\$2,350
15–250W	Short circuit; RF; thermal; DC offset	No	Yes	Tricolor LED	19x5 25x15.5	33	\$2,550
50–1,000W	Short circuit; RF; thermal; DC offset	No	Yes	Tricolor LED	19x5 25x15.5	42	\$2,500
50–1,000W	Short circuit; RF; thermal; DC offset	No	Yes	Tricolor LED	19x5 25x15.5	44	\$3,100
50–250W	Short circuit; RF; thermal; DC offset	No	Yes	Tricolor LED	19x5 25x16	75	\$3,695
15–250W	Short circuit; RF; thermal; DC offset	No	Yes	Tricolor LED	12x3 6x7 25	10	\$795
15–250W	Short circuit; RF; thermal; DC offset	No	Yes	Tricolor LED	12x2x5 5	6	\$450
1,000W	DC offset; ovr temp; short circuit; clipping; 10A circuit brkr	Yes	No	Power ready; signal; clip/protect	19x3 5x13 25	22.8	\$769
725W	DC offset; ovr temp; short circuit; clipping; 12A AC line fuse	No	No	Power ready; signal; clip/protect	19x3 5x13 25	34	\$1,199
250W	DC offset; ovr temp; short circuit; clipping; 2A circuit breaker	Yes	No	Power ready; signal; clip/protect	19x1 75x13 25	13.8	\$619
800W	DC offset; ovr temp; short circuit; clppng; 15A fuse	No	No	Power connected/stdby; 7-LED display per chan (inc pwr rdy/clip/prct)	19x3 5x13 25	34.2	\$1,539
1,000W	DC offset; ovr temp; short circuit; clipping; 10A circuit brkr	Yes	No	Power ready; sgnl; clip/prct	19x3 5x13 25	23.8	\$799
500W	DC offset; ovr temp; short circuit; clppng; 10A fuse	No	No	Power connected/stdby; 7-LED display per chan (inc power ready/clip/prct)	19x3 5x13 25	30	\$1,069



# POWER AMPS

Manufacturer	Model	Continuous Avg. Power Into 8Ω (20 Hz–20 kHz ± 1 dB)	Continuous Avg. Power Into 4Ω (20 Hz–20 kHz ± 1 dB)	Frequency Response	Signal-to-Noise	Total Harmonic Distortion	Damping Factor	Slew Rate
Carver Professional	pm950	325W per channel	475W per channel	20 Hz–20 kHz	>100 dB	<0.1%	<400	40 V/μs (bandwidth limited)
Carver Professional	pt1800	600W per channel	900W per channel	20 Hz–20 kHz	>100 dB	<0.5%	<400 @ 1 kHz	25 V/μs
Carver Professional	pt2400	750W per channel	1,200W per channel	20 Hz–20 kHz	>100 dB	<0.5%	<400 @ 1 kHz	25 V/μs
Carver Professional	pt250	465W per channel	625W per channel	20 Hz–20 kHz	>105 dB	<0.5%	<400	25 V/μs
Carver Professional	PX1450	375W per channel	725W per channel	20 Hz–20 kHz	>106 dB	<0.1%	<600 @ 10–400 Hz (ref 8Ω)	70 V/μs
Carver Professional	PX850	260W per channel	425W per channel	20 Hz–20 kHz	>106 dB	<0.1%	>600 @ 10–400 Hz (ref 8Ω)	70 V/μs
Carvin	DCM600	150W per channel	225W per channel	20 Hz–20 kHz	100 dB	0.03%	>350	>45 V/μs
Carvin	DCM1000	225W per channel	350W per channel	20 Hz–20 kHz	106 dB	0.03%	>400	>45 V/μs
Carvin	DCM1500	300W per channel	500W per channel	20 Hz–20 kHz	107 dB	0.03%	>450	>50 V/μs
Carvin	DCM2000	450W per channel	700W per channel	20 Hz–20 kHz	109 dB	0.03%	>500	>5 V/μs
Carvin	HT150	50W per channel	75W per channel	20 Hz–20 kHz	100 dB	0.1%	>300	>30 V/μs
Carvin	HT760M	175W per channel	250W per channel	20 Hz–20 kHz	103 dB	0.03%	>350	>45 V/μs
Chord	SPA 1032 Stereo	280W per channel	400W per channel	-1 dB, 0.2 Hz–44 kHz; -3 dB, 0.1 Hz–77 kHz	>105 dB	<-75 dB	N/A	70 V/μs
Chord	SPA 1424 Mono Block	350W per channel	500W per channel	-1 dB, 0.2 Hz–44 kHz; 0.1 Hz–77 kHz	>103 dB	<-75 dB	N/A	70 V/μs
Crate	SPA200	70W per channel	100W per channel	20 Hz–20 kHz	N/A	N/A	N/A	10 V/ns
Crate	SPA1400	450W per channel	260W per channel	20 Hz–20 kHz	-100 dB	0.02% @ 1 kHz	N/A	40 V/ns
Crate	SPA1400C	450W per channel	260W per channel	20 Hz–20 kHz	-100 dB	0.02% @ 1 kHz	N/A	40V/ns
Crate	SPA400	200W per channel	125W per channel	20 Hz–20 kHz	-100 dB	0.02% @ 1 kHz	250 (1 kHz @ 8Ω)	30V/ns
Crest Audio	V 1100, Vs 1100	300W per channel	550W per channel	10 Hz–165 kHz	105 dB	0.1%	>1,000	12 V/μs
Crest Audio	V 1500, Vs 1500	400W per channel	750W per channel	10 Hz–165 kHz	105 dB	0.1%	>1,000	12 V/μs
Crest Audio	V 450, Vs 450	150W per channel	225W per channel	10 Hz–165 kHz	105 dB	0.1%	>700	12 V/μs
Crest Audio	V 650, Vs 650	200W per channel	325W per channel	10 Hz–165 kHz	105 dB	0.1%	>800	12 V/μs
Crest Audio	V 900, Vs 900	250W per channel	450W per channel	10 Hz–165 kHz	105 dB	0.1%	>1,000	12 V/μs
Crown	CE 1000	275W per channel	450W per channel	20 Hz–20 kHz	>105 dB	<0.5%	>400	N/A
Crown	CE 2000	400W per channel	660W per channel	20 Hz–20 kHz	>105 dB	<0.5%	>400	N/A
Crown	CP 600	60W all channels driven	75W per channel	20 Hz–20 kHz	>100 dB	<0.3%	>250	N/A
Crown	CT-1610	540W per channel	870W per channel	20 Hz–20 kHz	>105 dB	<0.05%	>1000	N/A
Crown	CT-210	110W per channel	150W per channel	20 Hz–20 kHz	>105 dB	<0.05%	>1000	N/A
Crown	CT-410	220W per channel	240W per channel	20 Hz–20 kHz	>105 dB	<0.05%	>1000	N/A
Crown	CT-810	305W per channel	490W per channel	20 Hz–20 kHz	>105 dB	<0.05%	>1000	N/A
Crown	D-45	25W per channel	35W per channel	20 Hz–20 kHz	>110 dB	<0.05%	>400	N/A
Crown	D-75A	40W per channel	55W per channel	20 Hz–20 kHz	>110 dB	<0.05%	>400	N/A
Crown	K1	350W per channel	550W per channel	20 Hz–20 kHz	>100 dB	<0.1%	>3000	N/A
Crown	K2	500W per channel	800W per channel	20 Hz–20 kHz	>100 dB	<0.1%	>3000	N/A
Crown	MA-1200	310W per channel	480W per channel	20 Hz–20 kHz	>105 dB	<0.05%	>1000	N/A
Crown	MA-2400	520W per channel	800W per channel	20 Hz–20 kHz	>105 dB	<0.05%	>1000	N/A
Crown	MA-3600VZ	1,120W per channel	1565W per channel	20 Hz–20 kHz	>105 dB	<0.05%	>1000	N/A
Crown	MA-5000VZ	1,300W per channel	2000W per channel	20 Hz–20 kHz	>105 dB	<0.05%	>1000	N/A

Power  
ConsumptionProtection  
FeaturesAC Circuit  
Breaker

## Ground Lift

Indicator  
LightsDimensions  
(Inches)

## Weight (lbs.)

## Price

725W	DC offset, ovr temp; short circuit; clppng 12A fuse	No	No	Power connected/stdby; 7-LED dsply per chan (inc pwr rdy/clip/prct)	19x3 5x13.25	34	\$1,269
N/A	Short circuit; exc high frqncy; thermal; clppng; DC; soft start/input mute	No	Yes	Power ready; signal, clip, protect	19x5 25x12 75	46	\$2,379
11A	Short circuit; exc high frqncy; thermal; clppng; DC; soft start/input mute	No	Yes	Power ready; signal, clip, protect	19x5 25x12 75	48	\$2,779
1,200W (max)	Short circuit; exc high frqncy; thermal; clppng; DC; soft start/input mute	No	Yes	Power ready; signal, clip, protect	19x3 5x10 75	11	\$1,879
750W	Thermal; short circuit 15A circuit breaker	Yes	No	Power ready; sgml prsnt; clip; prct; thermal and stdby	19x5 75x15 38	58 2	\$1,245
840W	Thermal; short circuit 15A fuse	No	No	Power ready; sgml prsnt; clip; prct; thermal and stdby	19x5 75x15 38	46	\$895
750W (max)	Short circuit; RF; thermal; DC offset	Yes	Yes	Power; clip; signal protect	19x3 5x10	23	\$359.95
1,200W (max)	Short circuit; RF; thermal; DC offset	Yes	Yes	Power; clip; signal protect	19x3 5x10	26	\$439.95
1,800W (max)	Short circuit; RF; thermal; DC offset	Yes	Yes	Power; clip; signal protect	19x5 25x10	31	\$539.95
2,400W (max)	Short circuit; RF; thermal; DC offset	Yes	Yes	Power; clip; signal protect	19x5 25x10	36	\$639.95
180W (max)	Short circuit; RF; thermal; DC offset	No	No	Power; clip; signal protect	19x1 75x10	11	\$229.95
900W (max)	Short circuit; RF; thermal; DC offset	Yes	Yes	Power/clip/signal protect	19x3 5x10	23	\$469.95
N/A	Short circuit; thermal overload; clip	Yes	No	Power; fault; onset of clip	19x5 5x14	49	\$4,497
N/A	Short circuit; thermal overload; clip	Yes	No	Power; fault; onset of clip	19x5 5x14	40	\$5,597
N/A	N/A	No	No	N/A	19x3 5x7	19	\$399.99
N/A	Short circuit; RF; spkr out relays; trn on/off transient; thermal	Yes	No	Signal; limit; protect	19x3 5x15	27	\$599.99
N/A	Short circuit; RF; spkr out relays; trn on/off transient; thermal	Yes	No	Signal; limit; protect	19x3 5x15	27	\$699.99
10A (120 VAC)	Short circuit; RF; spkr out relays; trn on/off transient; thermal	No	No	Signal; limit; fault	19x3 5x15	27	\$499.99
1,490W	Active clip limit; auto ramp; thermal; DC; short circuit	Yes	Yes	Yes	19x5 25x12	47	(V) \$1,160 (VS) \$1,050
1,020W	Active clip limit; auto ramp; thermal; DC; short circuit	Yes	Yes	Yes	19x5 25x13 33	49	(V) \$1,390 (VS) \$1,250
625W	Active clip limit; auto ramp; thermal; DC; short circuit	Yes	Yes	Clip	19x5 25x12	38	(V) \$660 (VS) \$590
935W	Active clip limit; auto ramp; thermal; DC; short circuit	Yes	Yes	Clip	19x5 25x12	39	(V) \$780 (VS) \$690
1,250W	Active clip limit; auto ramp; thermal; DC; short circuit	Yes	Yes	Yes	19x5 25x12	46	(V) \$900 (VS) \$790
N/A	Short; DC; clip; other	Yes	No	Power; signal; fault; clip	19x 5 25x13	32 4	\$718
N/A	Short; DC; clip; other	Yes	No	Power; signal; fault; clip	19x 5 25x13	40 2	\$1,025
N/A	Short; DC; other	No	No	Power; signal; fault; clip	19x 3 5x12 75	25	\$849
N/A	Short; DC; ODEP; quad mute; other	Yes	No	IOC; SPI; ODEP; power	19x7x16	57 9	\$2,229
N/A	Short; DC; ODEP; quad mute; other	Yes	No	IOC; SPI; ODEP; power	19x3 5x16	29 4	\$974
N/A	Short; DC; ODEP; quad mute; other	Yes	No	IOC; SPI; ODEP; power	19x3 5x16	31 9	\$1,230
N/A	Short; DC; ODEP; quad mute; other	Yes	No	IOC; SPI; ODEP; power	19x5 25x16	47 25	\$1,717
N/A	Short; DC; other	No	No	IOC; signal; power	19x1 75x9	10	\$487
N/A	Short; DC; other	No	No	IOC; signal; power	19x1 75x9	10	\$641
N/A	Short; DC; clip; other	No	Yes	Signal; TLC; IOC; clip; enable	19x 3 5x16	32	\$1,532
N/A	Short; DC; clip; other	No	Yes	Signal; TLC; IOC; clip; enable	19x 3 5x16	38	\$1,840
N/A	Short; DC; ODEP; other	No	Yes	IOC; SPI; ODEP; enable	19x 3 5x16	44 1	\$1,789
N/A	Short; DC; ODEP; other	Yes	Yes	IOC; SPI; ODEP; enable	19x 3 5x16	51 75	\$2,299
N/A	Short; DC; ODEP; quad mute; other	Yes	Yes	IOC; SPI; ODEP; enable	19x 3 5x16	55 25	\$3,172
N/A	Short; DC; ODEP; quad mute; other	Yes	Yes	IOC; SPI; ODEP; enable; load/limit	19x5 25x16	77 8	\$4,146



# POWER AMPS

Manufacturer	Model	Continuous Avg. Power Into 8 $\Omega$ (20 Hz–20 kHz $\pm 1$ dB)	Continuous Avg. Power Into 4 $\Omega$ (20 Hz–20 kHz $\pm 1$ dB)	Frequency Response	Signal- to-Noise	Total Harmonic Distortion	Damping Factor	Slew Rate
Crown	MA-600	225W per channel	325W per channel	20 Hz–20 kHz	>105 dB	<0.05%	>1,000	N/A
Crown	MT-1200	310W per channel	480W per channel	20 Hz–20 kHz	>105 dB	<0.05%	>1,000	N/A
Crown	MT-2400	520W per channel	800W per channel	20 Hz–20 kHz	>105 dB	<0.05%	>1,000	N/A
Crown	MT-600	225W per channel	325W per channel	20 Hz–20 kHz	>105 dB	<0.05%	>1,000	N/A
Crown	PT-1	220W per channel	305W per channel	20 Hz–20 kHz	>105 dB	<0.05%	>1,000	N/A
Crown	PT-2	325W per channel	460W per channel	20 Hz–20 kHz	>105 dB	<0.05%	>1,000	N/A
Crown	PT-3	540W per channel	760W per channel	20 Hz–20 kHz	>105 dB	<0.05%	>1,000	N/A
Crown	Reference I	800W per channel	1190W per channel	20 Hz–20 kHz	>120 dB	<0.02%	>20,000/2500	N/A
Crown	Reference II	800W per channel	565W per channel	20 Hz–20 kHz	>117 dB	<0.02%	>20,000/2500	N/A
Demeter	VT275HF 150 Watt Stereo Power Amplifier	60W 20 Hz–20 kHz	60W per channel	20 Hz–20 kHz	<90 dB	0.06%	10:1	N/A
Demeter	VTHF-300m Tube Mono Block Professional Amplifier	300W 20 Hz–20 kHz	300W 20 Hz–20 kHz	N/A	<97 dB	0.06%	10:1	N/A
Furman	SP-20A Half Rack Stereo Power Amp	20W per channel	20W per channel	20 Hz–20 kHz	99 dB	0.05%	N/A	N/A
Hafler	9505	250W per channel	375W per channel	0.15 Hz–300 kHz	100 dB	<0.07%	1,000 (to 1 kHz), 100 (to 10 kHz), 20 (to 100 kHz)	150 V/ $\mu$ s
Hafler	P1000	50W per channel	55W per channel	0.1 Hz–100 kHz	100 dB	<0.2%	900 (up to 1 kHz), 400 (to 10 kHz), 40 (to 100 kHz)	20 V/ $\mu$ s
Hafler	P1500	75W per channel	85W per channel	0.15 Hz–300 kHz	100 dB	<0.1%	350 (to 1 kHz), 150 (to 10 kHz), 18 (to 100 kHz)	100 V/ $\mu$ s
Hafler	P3000	150W per channel	200W per channel	0.15 Hz–300 kHz	100 dB	<0.1%	400 (to 1 kHz), 200 (to 10 kHz), 18 (to 100 kHz)	100 V/ $\mu$ s
Hafler	P4000	200W per channel	275W per channel	0.2 Hz–200 kHz	100 dB	<0.1%	500 (to 1 kHz), 150 (to 10 kHz), 18 (to 100 kHz)	100 V/ $\mu$ s
Hafler	P7000	350W per channel	500W per channel	0.2 Hz–200 kHz	100 dB	<0.1%	600 (to 1 kHz), 200 (to 10 kHz), 25 (to 100 kHz)	100 V/ $\mu$ s
Hot House	Model Four Hundred	125W per channel	200W per channel	3 Hz–100 kHz	>100 dB	0.01%	>200	>60 V/ $\mu$ s
Hot House	Model M500 Mono Block	150W mono	275W mono	2 $\Omega$ (20 Hz–20 kHz) 475W mono	>100 dB	0.01%	>200	>60 V/ $\mu$ s
Hot House	Model M500HV H19 Voltage Mono Block	375W mono	600W mono	3 Hz–100 kHz	>100 dB	0.01%	>200	>60 V/ $\mu$ s
Hot House	Model One Thousand	350W per channel	500W per channel	3 Hz–100 kHz	>100 dB	<0.05%	>200	>60 V/ $\mu$ s
Hot House	Model Six Hundred	195W per channel	325W per channel	3 Hz–100 kHz	>100 dB	<0.05%	>200	>60 V/ $\mu$ s
Hot House	Model Two Thousand	450W per channel	700W per channel	3 Hz–100 kHz	>100 dB	<0.05%	>200	>60 V/ $\mu$ s
JBL	MPX1200	800W per channel	1,200W per channel	20 Hz–20 kHz	100 dB	0.15%	>200 (@ 8 $\Omega$ )	N/A
JBL	MPX300	200W per channel	300W per channel	20 Hz–20 kHz	100 dB	0.15%	>200 (@ 8 $\Omega$ )	N/A
JBL	MPX600	400W per channel	600W per channel	20 Hz–20 kHz	100 dB	0.15%	>200 (@ 8 $\Omega$ )	N/A
Lexicon	NT Series—Model 212	120W per channel	200W per channel	1 Hz–100 kHz	>110 dB	0.01%	>500	60 V/ $\mu$ s
Lexicon	NT Series—Model 225	250W per channel	400W per channel	1 Hz–100 kHz	>110 dB	0.01%	>500	60 V/ $\mu$ s
Lexicon	NT Series—Model 312	120W per channel	200W per channel	1 Hz–100 kHz	>110 dB	0.01%	>500	60 V/ $\mu$ s
Lexicon	NT Series—Model 501	500W per channel	800W per channel	1 Hz–100 kHz	>110 dB	0.01%	>300	60 V/ $\mu$ s
Lexicon	NT Series—Model 512	120W per channel	200W per channel	1 Hz–100 kHz	>110 dB	0.01%	>500	60 V/ $\mu$ s

N/A	Short, DC, ODEP, other	No	Yes	IOC/SPI, ODEP, enable	19x3.5x16	39.6	\$1,532
N/A	Short, DC, ODEP, other	No	Yes	Enable, ODEP	19x3.5x16	41	\$1,383
N/A	Short, DC, ODEP, other	Yes	Yes	Enable, ODEP	19x3.5x16	46.9	\$1,793
N/A	Short, DC, ODEP, other	No	Yes	Enable, ODEP	19x3.5x16	36.25	\$1,075
N/A	Short, DC, ODEP, other	Yes	Yes	Enable, IOC/SPI	19x3.5x16	30	\$1,281
N/A	Short, DC, ODEP, other	Yes	Yes	Enable, IOC/SPI	19x5.25x16	33	\$1,512
N/A	Short, DC, ODEP, other	Yes	Yes	Enable, IOC/SPI	19x7x16	36.5	\$1,768
N/A	Short, DC, ODEP, quad mute, other	Yes	Yes	Enable, IOC, ODEP, dynamic range	19x7x16	60.7	\$4,454
N/A	Short, DC, ODEP, quad mute, other	Yes	Yes	Enable, IOC, ODEP, dynamic range	19x7x16	56.1	\$3,070
300W	5A fuse	No	No	LED	19x7x12	45	\$2,299
600W	8A fuse	No	No	LED	19x7x15	49	\$2,649
130W	Short circuit; thermal overload; fuse	No	Yes	Clip, signal present	8.45x1.75x8.25	9	(w/XLRS) \$323
840W: 8 8A @120 VAC	± Rail 15A fuse	No	Yes	Power	19x5.25x12.5	50	\$2,200
260W (max)	NOMAD; 2A fuse	No	Yes	Power, signal, clip, thermal	19x1.75x8.8	12	\$569
325W (max)	Short circuit, 4A fuse	No	Yes	Power, signal, clip, thermal	19x3.5x8.5	22	\$599
600W (max)	Short circuit, 5A fuse	No	Yes	Power, signal, clip, thermal	19x3.5x9.875	23	\$779
720W (max)	Short circuit, 10A fuse	No	Yes	Power, signal, clip, thermal	19x5.25x11	34	\$999
1,100W, 12A @ 120 VAC	Short circuit, 5A fuse	No	Yes	Power, signal, clip, thermal	19x3.5x12.88	40	\$1,399
600W	RC network for RF, 5A fuse	No	No	N/A	19x3.5x10.5	28	\$1,699
600W	RC network for RF, 5A fuse	No	No	N/A	19x3.5x10.5	32	\$2,099
800W	RC network for RF, 8A fuse	No	No	N/A	19x3.5x10.5	34	\$2,499
1,500W	RC network for RF, 10A fuse	No	No	N/A	19x5.25x10.5	38	\$2,999
1,000W	RC network for RF, 8A fuse	No	No	N/A	19x5.25x10.5	32	\$2,499
500W per channel (dual mono amp w/2 AC cords)	RC network for RF, 12A fuse per channel	No	Yes	True RMS clip/channel	19x8.75x17	95	\$4,999
22.9A (111 VAC)	Full short/open circuit; ultrasonic/RF; currnt/thermal limiting	No	Yes	Power, signal present; clip; protect	19x5.25x16.1	65	\$2,418
6.9A (111 VAC)	Full short/open circuit; ultrasonic/RF; currnt/thermal limiting	No	Yes	Power, signal present; clip; protect	19x5.25x16.1	41	\$988
13.6A (111 VAC)	Full short/open circuit; ultrasonic/RF; currnt/thermal limiting	No	Yes	Power, signal present; clip; protect	19x5.25x16.1	47	\$1,428
675W	Internally and externally fused	No	Yes	Power on; near clipping, clipping	17x5.25x9	22	\$1,695
1,350W	Internally and externally fused	No	Yes	Power on; near clipping, clipping	17x5.25x15.5	40	\$2,395
1,020W	Internally and externally fused	No	Yes	Power on; near clipping, clipping	17x5.25x15.5	33	\$2,495
1,350W	Internally and externally fused	No	Yes	Power on; near clipping, clipping	17x5.25x15.5	44	\$2,395
1,600W	Internally and externally fused	No	No	Power on; near clipping, clipping	17x5.25x15.5	75	\$3,995



# POWER AMPS

Manufacturer	Model	Continuous Avg. Power Into 8Ω (20 Hz–20 kHz ± 1 dB)	Continuous Avg. Power Into 4Ω (20 Hz–20 kHz ± 1 dB)	Frequency Response	Signal-to-Noise	Total Harmonic Distortion	Damping Factor	Slew Rate
Mackie Designs	M1400i	250W per channel	425W per channel	20 Hz–40 kHz (±1 dB)	>107 dB	<0.025% @ 8Ω <0.05% @ 4Ω <0.15% @ 2Ω	>350 (0–400 Hz)	Volt: >50 V/μs to >100 V/μs bridged; current >32 A/μs
Manley Labs	Manley Studio 240	220 per channel	350 per channel	10 Hz–30 kHz	N/A	N/A	N/A	N/A
Manley Labs	Manley Studio 440	400 per channel	500 per channel	10 Hz–30 kHz	N/A	N/A	N/A	N/A
Miles Technology	MPR-450	60W per channel x (6)	75W per channel x (6)	20 Hz–20 kHz	>100 dB	0.15%	>400	Not slew limited
Panasonic	WP-1200	120W per channel	240W per channel	20 Hz–20 kHz	>100 dB	<0.1%	>100 (@ 1 kHz 8Ω)	N/A
Panasonic	WP-1400	240W per channel	400W per channel	20 Hz–20 kHz	>100 dB	<0.1%	>100 (@ 1 kHz 8Ω)	N/A
Peavey	CS1000X	325W per channel	525W per channel	5 Hz–50 kHz	100 dB	<0.03%	>200 (@ 40Ω)	40 V/μs
Peavey	CS1800G	350W per channel	600W per channel	5 Hz–50 kHz	100 dB	0.03%	>300 (@ 40Ω)	40 V/μs
Peavey	CS200X	85W per channel	85W per channel	10 Hz–40 kHz	100 dB	<0.1%	>200 (@ 40Ω)	15 V/μs
Peavey	CS3000G	600W per channel	1,000W per channel	5 Hz–50 kHz	100 dB	<0.03%	>300 (@ 8Ω)	40 V/μs
Peavey	CS500A	130W per channel	210W per channel	5 Hz–50 kHz	100 dB	0.03%	>200 (@ 40Ω)	40 V/μs
Peavey	CS800S	240W per channel	420W per channel	3 Hz–60 kHz	100 dB	0.03%	>1000 (@ 40Ω)	40 V/μs
Peavey	PV1200	270W per channel	425W per channel	10 Hz–40 kHz	100 dB	<0.1%	>300 (@ 80Ω)	20 V/μs
Peavey	PV2000	400W per channel	650W per channel	10 Hz–40 kHz	100 dB	<0.1%	>300 (@ 80Ω)	20 V/μs
Peavey	PV260	100W per channel	130W per channel	10 Hz–40 kHz	100 dB	<0.1%	>200 (@ 80Ω)	20 V/μs
Peavey	PV500	130W per channel	210W per channel	10 Hz–40 kHz	100 dB	<0.1%	>300 (@ 80Ω)	20 V/μs
QSC Audio Products	MX1500a	350W per channel	500W per channel	20 Hz–20 kHz	100 dB	0.05%	>200	N/A
QSC Audio Products	MX2000a	450W per channel	650W per channel	20 Hz–20 kHz	100 dB	0.05%	>200	N/A
QSC Audio Products	MX3000a	800W per channel	1,200W per channel	20 Hz–20 kHz	100 dB	0.1	>200	N/A
QSC Audio Products	MX700	150W per channel	225W per channel	20 Hz–20 kHz	100 dB	0.1%	>200	N/A
QSC Audio Products	PLX 1202	200W per channel	325W per channel	8 Hz–50 kHz, +0/-3 dB	106 dB, 20 Hz–20 kHz	<0.05%	>500	N/A
QSC Audio Products	PLX 1602	300W per channel	500W per channel	8 Hz–50 kHz, +0/-3 dB	106 dB, 20 Hz–20 kHz	<0.05%	>500	N/A
QSC Audio Products	PLX 2402	425W per channel	700W per channel	8 Hz–50 kHz, +0/-3 dB	106 dB, 20 Hz–20 kHz	<0.05%	>500	N/A
QSC Audio Products	PLX 3002	500W per channel	900W per channel	8 Hz–50 kHz, +0/-3 dB	106 dB, 20 Hz–20 kHz	<0.05%	>500	N/A
QSC Audio Products	PLX 3402	700W per channel	1,100W per channel	8 Hz–50 kHz, +0/-3 dB	106 dB, 20 Hz–20 kHz	<0.05%	>500	N/A
QSC Audio Products	PowerLight 1.0	200W per channel	325W per channel	20 Hz–20 kHz	108 dB	0.1%	>350	N/A
QSC Audio Products	PowerLight 1.0HV	300W per channel	500W per channel	20 Hz–20 kHz	108 dB	0.1%	>350	N/A
QSC Audio Products	PowerLight 1.4	300W per channel	500W per channel	20 Hz–20 kHz	108 dB	0.1%	>350	N/A
QSC Audio Products	PowerLight 1.5X Bi-amp	200W channel 1, 450W channel 2	325 W Ch. 1/ 700W Ch. 2	20 Hz–20 kHz	108 dB	0.1%	>350	N/A
QSC Audio Products	PowerLight 1.6HVX Bi-amp	300W channel 1, 700W channel 2	500 W Ch. 1/ 1,100W Ch. 2	20 Hz–20 kHz	108 dB	0.1%	>350	N/A
QSC Audio Products	PowerLight 1.8	400W per channel	650W per channel	20 Hz–20 kHz	108 dB	0.1%	>350	N/A
QSC Audio Products	PowerLight 2.0HV	650W per channel	1,000W per channel	20 Hz–20 kHz	108 dB	0.1%	>350	N/A
QSC Audio Products	PowerLight 2.4MB Mono-block	1000W	1,600W per channel	20 Hz–20 kHz	108 dB	0.1%	>350	N/A
QSC Audio Products	PowerLight 3.4	725W per channel	1,200W per channel	20 Hz–20 kHz	108 dB	0.1%	>500	N/A

Power Consumption	Protection Features	AC Circuit Breaker	Ground Lift	Indicator Lights	Dimensions (Inches)	Weight (lbs.)	Price
65W at idle	Short circuit; thermal	No	No	Signal present; -20, -9, -6, -3; OL each channel	17.25x15.25x3.5	36	\$699
1,400W	Tubes; fuse	No	No	Yes	19x8.75x11	75	\$7,000
1,400W	Tubes; fuse	No	No	Yes	19x8.75x11	75	(pair) \$9,500
780W	Short circuit; high temp; DC offset	No	No	Power on; high temp; all 6 channels: signal present, clip	19x3.5x12.7	25	\$1,099
270W	Thermal overload; DC offset	Yes	No	Power, peak, protection	19x5.25x15.5	26.45	\$680
520W	Thermal overload; DC offset	Yes	No	Power, peak, protection	19x5.25x15.5	38.3	\$840
N/A	Short circuit; thermal overload; DC; RF	Yes	No	On; DDT	19x5.25x14	51	\$1,099.99
N/A	Short circuit; thermal overload; DC; RF	Yes	No	On; DDT	19x3.5x17	35	\$1,299.99
N/A	Short circuit; thermal overload; DC; RF	Yes	No	On; DDT	19x1.75x17	18.5	\$459.99
N/A	Short circuit; thermal overload; DC; RF	Yes	No	On; DDT	19x5.25x17	77	\$2,199.99
N/A	Short circuit; thermal overload; DC; RF	No	No	On; DDT	19x3.5x19	39	\$699.99
N/A	Short circuit; thermal overload; DC; RF	Yes	No	On; DDT	19x3.5x22	23.5	\$899.99
N/A	Short circuit; thermal overload; DC; RF	Yes	No	On; DDT	19x5.25x13	43.5	\$549.99
N/A	Short circuit; thermal overload; DC; RF	Yes	No	On; DDT	19x7x14	64	\$749.99
N/A	Short circuit; thermal overload; DC; RF	Yes	No	On; DDT	19x3.5x9.6	18.5	\$299.99
N/A	Short circuit; thermal overload; DC; RF	Yes	No	On; DDT	19x5.25x9	29	\$399.99
N/A	Full short circuit; thermal monitoring; ultrasonic/RF	No	No	On; clip; protect; signal	19x17.9x3.5	42	\$1,195
N/A	Full short circuit; thermal monitoring; ultrasonic/RF	No	No	On; clip; protect; signal	19x17.9x5.25	54	\$1,595
N/A	Full short circuit; thermal monitoring; ultrasonic/RF	No	No	On; clip; protect; signal	19x17.9x5.25	69	\$2,355
N/A	Full short circuit; thermal monitoring; ultrasonic/RF	No	No	On; clip; protect; signal	19x12x3.5	25	\$675
N/A	Full short circuit; thermal monitoring; ultrasonic/RF	No	No	On; signal ladder; clip; protect; parallel/bridge mode	19x3.5x13.25	21	\$858
N/A	Full short circuit; thermal monitoring; ultrasonic/RF	No	No	On; signal ladder; clip; protect; parallel/bridge mode	19x3.5x13.25	21	\$1,198
N/A	Full short circuit; thermal monitoring; ultrasonic/RF	No	No	On; signal ladder; clip; protect; parallel/bridge mode	19x3.5x13.25	21	\$1,498
N/A	Full short circuit; thermal monitoring; ultrasonic/RF	No	No	On; signal ladder; clip; protect; parallel/bridge mode	19x3.5x13.25	21	\$1,798
N/A	Full short circuit; thermal monitoring; ultrasonic/RF	No	No	On; signal ladder; clip; protect; parallel/bridge mode	19x3.5x13.25	21	\$2,098
N/A	Full short circuit; thermal monitoring; ultrasonic/RF	No	No	On; signal ladder; clip; protect; parallel/bridge mode	19x17.9x3.5	18	\$1,488
N/A	Full short circuit; thermal monitoring; ultrasonic/RF	No	No	On; clip; signal; standby	19x17.9x3.5	18	\$1,578
N/A	Full short circuit; thermal monitoring; ultrasonic/RF	No	No	On; clip; signal; standby; protect	19x17.9x3.5	18	\$1,698
N/A	Full short circuit; thermal monitoring; ultrasonic/RF	No	No	On; clip; signal; standby	19x17.9x3.5	18	\$1,728
N/A	Full short circuit; thermal monitoring; ultrasonic/RF	No	No	On; clip; signal; standby	19x17.9x3.5	18	\$1,868
N/A	Full short circuit; thermal monitoring; ultrasonic/RF	No	No	On; clip; signal; standby; protect	19x17.9x3.5	18	\$2,028
N/A	Full short circuit; thermal monitoring; ultrasonic/RF	No	No	On; clip; signal; standby; protect	19x17.9x3.5	18	\$2,198
N/A	Full short circuit; thermal monitoring; ultrasonic/RF	No	No	On; clip; signal; standby	19x17.9x3.5	18	\$2,068
N/A	Full short circuit; thermal monitoring; ultrasonic/RF	No	No	On; clip; signal; standby	19x17.9x5.25	30	\$2,998



# POWER AMPS

Manufacturer	Model	Continuous Avg. Power Into 8Ω (20 Hz–20 kHz ± 1 dB)	Continuous Avg. Power Into 4Ω (20 Hz–20 kHz ± 1 dB)	Frequency Response	Signal- to-Noise	Total Harmonic Distortion	Damping Factor	Slew Rate
QSC Audio Products	PowerLight 4.0	900W per channel	1,400W per channel	20 Hz–20 kHz	108 dB	0.1%	>500	N/A
QSC Audio Products	USA 400	125W per channel	200W per channel	20 Hz–20 kHz	105 dB	0.1%	>200	N/A
QSC Audio Products	USA 900	270W per channel	450W per channel	20 Hz–20 kHz	104 dB	0.1%	>200	N/A
QSC Audio Products	USA 1310	400W per channel	655W per channel	20 Hz–20 kHz	106 dB	0.1%	>200	N/A
Quested	AP800	450W per channel	770W per channel	20 Hz–20 kHz	105 dB	0.02%	>400	50V/μs
Rane	MA6S	100W per channel	150W per channel	20 Hz–20 kHz	103 dB	0.07%	300 (@ 1 kHz)	N/A
Roland	SRA-200E	100W per channel	150W per channel	20 Hz–50 kHz	100 dB	0.05%	N/A	N/A
Samson	Servo 120	52W per channel	60W per channel	10 Hz–100 kHz	105 dB	<0.05%	>150	N/A
Samson	Servo 170	60W per channel	85W per channel	20 Hz–50 kHz	103 dB	<0.01%	N/A	N/A
Samson	Servo 260	90W per channel	130W per channel	20 Hz–50 kHz	103 dB	<0.03%	>100	N/A
Samson	Servo 550	220W per channel	275W per channel	20 Hz–50 kHz	103 dB	<0.03%	>100	N/A
Soundtech	PL1204	190W per channel	280W per channel	20 Hz–20 kHz	100 dB	<0.05%	300:1	40 V/μs
Soundtech	PL1402	390W per channel	620W per channel	20 Hz–20 kHz	100 dB	<0.05%	300:1	40 V/μs
Soundtech	PL1602	525W per channel	800W per channel	20 Hz–20 kHz	100 dB	<0.05%	200:1	56 V/μs
Soundtech	PL200	65W per channel	100W per channel	20 Hz–20 kHz	90 dB	<0.1%	>300:1	48 V/μs
Soundtech	PL350M	150W mono	230W mono	20 Hz–20 kHz	90 dB	<0.1%	>300:1	40 V/μs
Soundtech	PL602	200W per channel	300W per channel	20 Hz–20 kHz	120 dB	<0.1%	>300:1	40 V/μs
Soundtech	PL802	230W per channel	400W per channel	20 Hz–20 kHz	90 dB	<0.1%	300:1	40 V/μs
Soundtech	PS802	230W per channel	400W per channel	20 Hz–20 kHz	120 dB	<0.05%	200:1	42 V/μs
Stewart Audio	Pro Reference 1000	200W per channel	350W per channel	15 Hz–20 kHz	>108 dB	<0.05%	>500	>35 V/μs
Stewart Audio	Pro Reference 500	110W per channel	190W per channel	15 Hz–20 kHz	>108 dB	<0.05%	>500	>35 V/μs
Stewart Audio	World 1.2	240W per channel	420W per channel	20 Hz–20 kHz	>100 dB	<0.1%	>500	>30 V/μs
Stewart Audio	World 1.6	390W per channel	650W per channel	20 Hz–20 kHz	>100 dB	<0.1%	>500	>30 V/μs
Stewart Audio	World 2.1	475W per channel	675W per channel	20 Hz–20 kHz	>100 dB	<0.1%	>500	>30 V/μs
Stewart Audio	World 250	70W per channel	120W per channel	20 Hz–20 kHz	>100 dB	0.05%	>500	>30 V/μs
Stewart Audio	World 600	130W per channel	230W per channel	20 Hz–20 kHz	>100 dB	<0.1%	>500	>30 V/μs
Studiomaster	1200 D	375x375 (8)	600x600 (4)	20 Hz–20 kHz	100 dB	0.015%	200	20V
Studiomaster	700 D	210x210 (8)	350x350 (4)	20 Hz–20 kHz	100 dB	0.008%	200	20V/μs
TASCAM	PA-150	115W per channel	150W per channel	20 Hz–20 kHz	90 dB	0.06%	45 (@ 8Ω)	N/A
TASCAM	PA-20MKII	N/A	25W per channel	20 Hz–20 kHz	85 dB	0.05%	80 (@ 8Ω)	N/A
Tube Works	1160 MosValve	60W per channel	80W per channel	N/A	>95 dB @ 8Ω	N/A	N/A	N/A
Tube Works	1500 MosValve	185W per channel	250W per channel	N/A	>97 dB @ 8Ω	N/A	N/A	N/A
Whirlwind	P-12	11W per channel	12W per channel	20 Hz–30 kHz	101 dB	0.2%	N/A	9.6 V/μs
Yamaha	A100A	50W per channel	N/A	20 Hz–20 kHz	107 dB	0.2%	>70	10 V/μs
Yorkville Sound	SR-300	200W per channel	300W per channel	20 Hz–20 kHz	95 dB	0.01%	>400	10 V/μs

Power Consumption	Protection Features	AC Circuit Breaker	Ground Lift	Indicator Lights	Dimensions (Inches)	Weight (lbs.)	Price
N/A	Full short circuit; thermal monitoring; ultrasonic/RF	No	No	On; clip; signal; standby	19x17.9x5.25	30	\$3,398
N/A	Full short circuit; thermal monitoring; ultrasonic/RF	Yes	No	On; clip; protect	19x9.5x5.25	24	\$675
N/A	Full short circuit; thermal monitoring; ultrasonic/RF	Yes	No	On; clip; protect	19x9.5x5.25	34	\$805
N/A	Full short circuit; thermal monitoring; ultrasonic/RF	Yes	No	On; clip; protect	19x10.8x7	54	\$1,165
230 VAC @ 10A	DC/short protection	Yes	No	Mute; fault/DC; limit; power; temp warning	19x1.75x15	51	N/A
2,200W (max)	Main fuse; channel fuses; forced cooling	No	No	Channel-ready; clip limit; SOA limit	19x5.25x11	44	\$1,599
Ecos	Yes	No	Yes	Yes	19x14.38 x 1.93	11.1	\$795
240W	Short circuit; thermal; DC offset	No	No	Prot; 5-segment/3-color level meters; power; spkr disable (for headphone)	17.5 (19 w/rack ears included)x1.75x11.5	15.6	\$259.99
838W (115 VAC)	Thermal; DC offset; fuse	No	No	Clip; idle; protect; power	19x5.2x9.2	13.7	\$299.99
420W	Short circuit; thermal overload; DC offset	No	No	Clip; peak; protect; power	19x1.72x10.4	14.3	\$379.90
430W (155 VAC); 480W (240 VAC)	Thermal; DC offset; fuse	No	No	Clip; idle; protect; power	19x3.5x9.5	17.6	\$449.99
1,800W	Thermal overload; DC offset; fuse	No	No	Clip; protect; power; mono bridge	3.5x19x16	52	\$1,229.90
1,900W	Thermal overload; DC offset; fuse	No	No	Clip; protect; power; mono bridge	5.23x19x16	40	\$1,199.90
1,900W	Thermal overload; DC offset; fuse	No	No	Clip; protect; power; mono bridge	5.23x19x14	21	\$1,429.90
310W (115 VAC); 335W (240 VAC)	Thermal protection; DC offset; fuse	No	No	Clip; protect; power; mono bridge	1.72x10.4x19	14.3	\$479.90
N/A	Thermal; DC offset; fuse	No	No	Clip; protect; power	3.5x19x14	26.4	\$49.90
1,080W	Short circuit; thermal overload; DC offset; fuse; current limit; power-up/down	No	No	Clip; protect; power; mono bridge	19x3.47x14	34.1	\$649.90
1,080W	Thermal overload; DC offset; fuse	No	No	Clip; protect; power; mono bridge	5.23x19x16	38	\$849.90
1,000W	Short circuit; thermal overload; DC offset; fuse; current limit; power-up/down	No	Yes	Clip; protect; power; mono bridge	19x1.72x14	15.8	\$749.90
5.25A (120 VAC)	7-stage circuit guard; short circuit; thermal overload; DC offset; RF	Yes	No	Clip; signal; power	19x1.72x15	11	\$1,099
3.5A (120 VAC)	7-stage circuit guard; short circuit; thermal overload; DC offset; RF	Yes	No	Clip; signal; power	19x1.72x15	10	\$799
6A (120 VAC)	7-stage circuit guard; short circuit; thermal overload; DC offset; RF	Yes	No	Clip; signal; power	19x1.72x15	11	\$999
5A (120 VAC)	7-stage circuit guard; short circuit; thermal overload; DC offset; RF	Yes	No	Clip; signal; power	19x1.72x15	16	\$1,199
5A (120 VAC)	7-stage circuit guard; short circuit; thermal overload; DC offset; RF	Yes	No	Clip; signal; power	19x1.72x15	17	\$1,399
5.25A (120 VAC)	7-stage circuit guard; short circuit; thermal overload; DC offset; RF	Yes	No	Clip; signal; power	19x1.72x5.5	5.5	\$469
5.8A (120 VAC)	7-stage circuit guard; short circuit; thermal overload; DC offset; RF	Yes	No	Clip; signal; power	19x1.72x15	10	\$699
2,400W	Gated power stage; crowbar spkr protect	No	Yes	Peak; temp; fault; mono; bridge; power	17x16x3.56	45	\$995
1,600W	Gated power stage; crowbar spkr protect	No	Yes	Peak; temp; fault; mono; bridge; power	17x16x3.56	38	\$649
620W	DC offset; power overload; temp	Yes	Yes	Clip; power; protect	19x5.25	19.4	\$400
90W	DC balance; overload	Yes	Yes	Clip; power; protect	19x1.72	9.9	\$250
400W (Max 120 VAC)	Short circuit; thermal	No	No	Power (1); clip (2)	3.5x19x7	13	\$395
1,400W (120/240 VAC)	Short circuit; thermal; time delay turn-on relay	No	No	Power (1); clip (2)	3.5x19x11.5	30	\$650
75W	SOAR	No	No	Clip	19x1.72	N/A	\$259.95
120W	Short circuit; thermal; DC detector	No	No	Meters; clip	11.63x3.75x8.69	10	\$329
500W (max)	Current limit; thermal; fuse	No	No	Activity; clip; limit	19x3.5x3.5	22.5	\$499



# REFERENCE MONITORS

Manufacturer	Product	Enclosure Type	Powered/Unpowered	Frequency Response	Sensitivity	Crossover Frequency	Woofer Size and Type
Alesis	Monitor One	Superport vented	Unpowered	45 Hz–18 kHz	88 dB	2.5 kHz	6.5" polypropylene cone
Alesis	Monitor Two	Superport vented	Unpowered	40 Hz–18 kHz	90 dB	1.5 and 6 kHz, asymmetrical	6.5" polypropylene cone
Alesis	Point Seven	Superport vented	Unpowered	85 Hz–22 kHz	88 dB	2 kHz, 2nd order	5" nonwoven carbon fiber
Ambiance Acoustics	California Cube Loudspeaker System w/EOC-1 Equalizer	Vented	Unpowered	38 Hz–16.5 kHz (5 dB)	90 dB	N/A	N/A
ATC	Pro 20A	Sealed	Powered	60 Hz–20 kHz	N/A	2.8 kHz	6.5", superlinear
ATC	SCM10 Pro	Sealed	Unpowered	65 Hz–20 kHz (-6 dB)	80 dB	2.8 kHz	5"
ATC	SCM100A Pro	Ported reflex	Powered	32 Hz–20 kHz (-6 dB)	-115 dB	380 Hz and 3.5 kHz	12" superlinear
ATC	SCM20 Pro	Sealed	Unpowered	60 Hz–0 kHz (-6 dB)	86 dB	2.8 kHz	6.5" superlinear
ATC	SCM20A Pro	20-liter cast aluminum	Powered	N/A	N/A	2.8 kHz	6.5" superlinear
ATC	SCM20SL	20-liter	Unpowered	N/A	83 dB @ 1W/1m	2.8 kHz	6" superlinear
ATC	SCM50A Pro	Ported reflex	Powered	38 Hz–20 kHz (-6 dB)	N/A	380 Hz and 3.5 kHz	9" superlinear
Audix	N-10	Bass reflex	Unpowered	40 Hz–20 kHz	89 dB	2.2 kHz	7" Kevlar
Audix	N-5	Bass reflex	Unpowered	40 Hz–20 kHz	87 dB	2.2 kHz	7" Kevlar
Audix	PH15-VS	Bass reflex	Powered	50 Hz–20 kHz	86 dB	2.5 kHz	5.25" poly
Audix	Studio 1A	Bass reflex	Unpowered	55 Hz–18 kHz	87 dB	3 kHz	6.5" poly
Bag End	D10E-I Subwoofer	Sealed	Unpowered	8–95 Hz (w/ELF processor)	N/A	N/A	10" EL-10 woofer
Bag End	Infrasub 18 Subwoofer	Sealed	Powered	8–95 Hz	N/A	N/A	18" EL-18P LF woofer
Bag End	MM-8 Near Field Monitor	Ported	Unpowered	100 Hz–20 kHz	84 dB	Time Align EQ filter @ 2.9 kHz	8" LF
Bag End	MM-8H	Ported	Unpowered	100 Hz–20 kHz	84 dB	Time Align EQ filter @ 2.9 kHz	8" LF
Barbetta	DIVA D-9	Ported reflex	Powered	48 Hz–20 kHz ( $\pm 1$ dB)	N/A	3.245 Hz	8" polymer-treated
Barbetta	G-10	Ported reflex	Powered	39 Hz–22 kHz ( $\pm 1$ dB)	N/A	3.240 Hz	10" mineral-filled polypropylene
Benson Audio Labs	Studiostat 8.2	Vented	Unpowered	39 Hz–21 kHz (-6 dB)	92 dB	1.6 kHz	8" cast frame; 2" voice coil
Bryston	PMC IB-1S	Transmission line	Powered or unpowered	25 Hz–25 kHz	89 dB @ 1W/1m	380 and 3.8 kHz	10" carbon fiber/Nomex
Bryston	PMC LB-1	Transmission line	Powered or unpowered	35 Hz–25 kHz	87 dB @ 1W/1m	2.5 kHz	4.5" 1 KW pulse with 4" voice coil
Bryston	PMC TB-1S	Transmission line	Powered or unpowered	40 Hz–25 kHz	90 dB @ 1W/1m	3 kHz	Doped 6" cast magnesium alloy
Diamond Audio	S2 Pro-Media 1060 Powered Subwoofer	Dual-port	Powered unpowered	50–140 Hz	N/A	12 dB/octave continuously variable from 70–140 Hz	6.5" long-throw neodymium DVC subwoofer
Diamond Audio	S2 Pro-Media 1100 Powered Subwoofer	Dual-port vented	Powered	30–140 Hz	N/A	12 dB/octave continuously variable from 70–140 Hz	8" long-throw neodymium DVC subwoofer
Diamond Audio	S2 Pro-Media 4060 System	Dual-port vented	Powered	60 Hz–20 kHz ( $\pm 3$ dB)	N/A	120 Hz 12 dB/octave active (HP and LP); 3.5 kHz 12 and 6 dB/octave passive (HP and LP)	6.5" long-throw neodymium DVC subwoofer
Diamond Audio	S2 Pro-Media 4100 System	Dual-port vented	Powered	50 Hz–20 kHz ( $\pm 3$ dB)	N/A	120 Hz 12 dB/octave active (HP and LP); 3.5 kHz 12 and 6 dB/octave passive (HP and LP)	8" long-throw neodymium DVC subwoofer
Digital Designs	DD161d	Ported and sealed with use of port plugs	Unpowered	45 Hz–20 kHz	90 dB	1.8 kHz	6.5" composite-filled poly
Digital Designs	DD162	Ported and sealed with use of port plugs	Unpowered	42 Hz–20 kHz	90 dB	3.5 kHz	(2) 6.5" composite-filled poly woofers
Digital Designs	DD261d	Vented	Unpowered	45 Hz–20 kHz	91 dB	1.8 kHz	6.5" composite-filled poly
Digital Designs	DD262d	Ported and sealed with use of port plugs	Unpowered	42 Hz–20 kHz	92 dB	1.5 kHz	6.5" composite-filled poly woofers
Digital Designs	DD462	Ported and sealed with use of port plugs	Unpowered	38 Hz–20 kHz	93 dB	1.8 kHz	4 each 6.5" composite-filled poly woofers
Digital Designs	M6	Vented	Unpowered	45 Hz–20 kHz	90 dB	3.5 kHz	6.5" composite-filled poly
Digital Designs	M6b	Ported and sealed with use of port plugs	Unpowered	45 Hz–20 kHz	90 dB	3.5 kHz	6.5" composite-filled poly

Midrange Size and Type	Tweeter Size and Type	Magnetic Shielding	Cabinet Dimensions (HxWxD)	Weight (lbs.)	Notes	Price (per pair)
N/A	1" silk dome	No	15x9.25x8.5	5	5-way binding posts	\$399
5"	1" silk dome	No	14x20x14	34	Midfield reference monitor	\$699
N/A	1" silk dome	Yes	7.1x11.2x7.25		Adjustable ports if used w/subwoofer	\$299
4 full-range 4.5" treated paper cones/rubber surround	N/A	No	13.6x13.6x13.6	Cabinet: 30; equalizer: 3	Price includes equalizer	Starting at \$1,295
N/A	1"	No	17.6x10.6x12.2	66		\$4,595
N/A	1" soft dome	Optional	15x7.1x10	22		\$1,650
3" soft dome	1" soft dome	Optional	32.8x15.7x22.29	143		\$9,995
N/A	1" soft dome	Optional	17.3x9.8x12.4	50.6		\$2,500
N/A	1" soft dome	Optional	17.6x10.6x12.2	66		\$4,899
N/A	1" soft dome	Optional	15x7.1x10	50.6		\$2,399.95
3" soft dome	1" soft dome	Optional	28.2x13.8x18.8	107.8		\$8,995
N/A	1" cloth dome	No	22x10x13.5	45		\$1,995
N/A	1" cloth dome	No	15x9.5x11	24		\$1,495
N/A	1" dome	Yes	9x6x9	18		\$479
N/A	1" cloth dome	Optional	13x9x10	18		\$599
N/A	N/A	No	13x22.5x13	50	Studio subwoofer for use w/ELF processor	(each) \$710
N/A	N/A	No	23.5x21.25x18.25	92	Time Align subwoofer w/8 Hz response; 400W power amp	(each) \$1,495
N/A	1.75" aluminum compression HF	No	17.5x12.25x8	31	For use w/ELF subwoofer; EQ; polarity switch	\$2,480
N/A	1.75" aluminum compression HF	No	17.5x12.25x8	31	Includes cloth grille (no switches)	\$2,264
N/A	1" titanium dome	Yes	14.5x10.75x11	36	Bi-amplified	N/A
N/A	1" titanium dome	Yes	14.5x12x17	47	Bi-amplified	N/A
N/A	5"x5" electrostatic element	Yes	17.75x11x12	34	Optimum listening-plane indicator	\$1,399
5.5" doped fabric	3.5" silk dome w/double chamber	Optional	29x18x13	76	Optional Bryston power modules	\$4,500
N/A	Silk soft dome w/double chamber	Yes	21x10x7	21	Optional Bryston power modules	\$2,160
N/A	Aluminum alloy phase shield-ferro fluid	Yes	16x12x8	18	Optional Bryston power modules	\$900
N/A	N/A	Yes	11.5x8.5x14.5	20	RCA (line level) or push-type speaker connectors (amplified levels); bass output level control; polarity switch	\$289
N/A	N/A	Yes	16.5x8.5x17	30	RCA (line level) or push-type speaker connectors (amplified levels); bass output level control; polarity switch	\$399
4.5" neodymium (midbass)	0.5" poly-aluminum composite dome tweeter	Yes	Sub: 11.5x8.5x14.5; satellite: 7.25x5x4.5	36	4-pc satellite/subwoofer system; S2 DS1 speaker stands; mic input w/level control; S2 TP-1 for use w/existing preamps	\$499
4.5" neodymium (midbass)	0.5" poly-aluminum composite dome tweeter	Yes	Sub: 16.5x8.5x17; satellite: 7.25x5x4.5	48	4-pc satellite/subwoofer system; S2 DS1 speaker stands; mic input w/level control; S2 TP-1 for use w/existing preamps	\$649
N/A	25 mm aluminum dome	Optional	9x13.5x12	19.5	Bi-wired; 2-tiered baffle	\$614
N/A	25 mm dome; 28 mm textile dome	Optional	15x9.5x12	25	Bipolar	\$908
N/A	1" aluminum dome	Yes	10x18.5x16	34	Bi-wired; 2-tiered baffle	\$250
	25 mm dome; 28 mm textile dome	Optional	20.5x10x16	25	Bipolar	\$1,037
N/A	25 mm dome; 28 mm textile dome	Optional	29x13.5x12	60	Bipolar	\$1,345
N/A	0.75"	Optional	9x13.5x12	18.5		\$219
N/A	20 mm dome	Optional	9x13.5x12	19.5		\$279



# REFERENCE MONITORS

Manufacturer	Product	Enclosure Type	Powered/Unpowered	Frequency Response	Sensitivity	Crossover Frequency	Woofer Size and Type
Dynaudio Acoustics	BM15	Reflex	Unpowered	43 Hz–20 kHz	88 dB	2.7 kHz	9.5" polypropylene cone with 4" voice coil
Dynaudio Acoustics	BM15A	Reflex	Powered	40 Hz–21 kHz	N/A	1.7 kHz	9.5" polypropylene cone with 4" voice coil
Dynaudio Acoustics	BM5	Reflex	Unpowered	55 Hz–29 kHz	87 dB	5.2 kHz	6.5" polypropylene cone with 3" voice coil
Dynaudio Acoustics	BM6	Reflex	Unpowered	43 Hz–20 kHz	86 dB	3.1 kHz	6.5" polypropylene cone with 3" voice coil
Dynaudio Acoustics	BM6A	Reflex	Powered	42 Hz–21 kHz	N/A	2.2 kHz	6.5" polypropylene cone with 3" voice coil
Dynaudio Acoustics	BX30	Reflex subwoofer	Powered	22 Hz–80/95/120 Hz	N/A	80/95/120 Hz	12" polypropylene cone with 4" voice coil
Dynaudio Acoustics	M1	Reflex	Unpowered	50 Hz–20 kHz	88 dB	N/A	2x6" polypropylene cone with 3" voice coil
Dynaudio Acoustics	M1.5	Reflex	Unpowered	40 Hz–20 kHz	88 dB	N/A	2x6.5" polypropylene cone with 3" voice coil, fluid cooled
Dynaudio Acoustics	M2	Reflex	Unpowered	45 Hz–20 kHz	87 dB	N/A	2x8" polypropylene cone with 2" voice coil
Dynaudio Acoustics	M3	Reflex	Unpowered	40 Hz–20 kHz	88 dB	N/A	2x12" polypropylene cone with 4" voice coil, fluid cooled
Eastern Acoustic Works	MM12Se w/2-channel subwoofer	2x full-range satellites	Unpowered	45 Hz–20 kHz (±3 dB)	89 dB	N/A	5.25" cone per channel
Eastern Acoustic Works	MS103	Vented	Unpowered	40 Hz–19 kHz (±3 dB)	95 dB	N/A	15" cone
Eastern Acoustic Works	MS20	Vented	Unpowered	50 Hz–19 kHz (±3 dB)	88 dB	N/A	7" polypropylene cone
Eastern Acoustic Works	MS30C	Vented	Unpowered	45 Hz–19 kHz (±3 dB)	90 dB	N/A	8" cone
Eastern Acoustic Works	MS63	Vented	Unpowered	50 Hz–19 kHz (±3 dB)	95 dB	N/A	12" cone
Electro-Voice	MS802	Vented	Unpowered	45 Hz–18 kHz (±3 dB)	91 dB	2 kHz	8"
Electro-Voice	S-60	Sealed	Unpowered	60 Hz–18 kHz	88 dB	2.5 kHz	6.5"
Electro-Voice	S-80A	Vented	Unpowered	80 Hz–15 kHz	91 dB	2 kHz	8"
Electro-Voice	Sentry 100A	Vented	Unpowered	45 Hz–18 kHz	91 dB	2 kHz	8"
Electro-Voice	Sentry 500	Vented	Unpowered	40 Hz–18 kHz (±3 dB)	96 dB	1.5 kHz	12" extended voice coil
Event Electronics	20/20 Direct Field Monitor	Ported	Unpowered	50 Hz–20 kHz (±2 dB)	88 dB	2.2 kHz, 2nd order	8" mineral-filled polypropylene cone
Event Electronics	20/20as Bi-amplified System	Ported	Powered	38 Hz–20 kHz, ±2 dB (-3 dB @ 35 Hz)	N/A	2.6 kHz, active, 4th order	8" mineral-filled polypropylene cone
Event Electronics	20/20p Powered Direct Field Monitor System	Ported	Powered	38 Hz–20 kHz, ±3 dB (-2 dB @ 500 Hz)	N/A	2.2 kHz, active, 2nd order	8" mineral-filled polypropylene cone
Event Electronics	Tria Triamplified Monitor System	Ported	Powered	35 Hz–20 kHz, ±3 dB (-2 dB @ 38 Hz)	N/A	VLF: 60 Hz, satellite: 2.9 kHz active	VLF: 8" mineral-filled polypropylene cone; satellite: 5.25" mineral-filled polypropylene cone
Fostex	6301BEA	Sealed	Powered	80 Hz–13 kHz	84 dB	N/A	N/A
Fostex	PS-3	Sealed	Powered	70 Hz–20 kHz ±3 dB	60 mV	N/A	5.25" cone
Genelec	1029A	Ported	Powered	68 Hz–18 kHz (±2.5 dB)	110 dB	Electronic (3.3 kHz)	5" coated cone
Genelec	1030AP	Ported	Powered	52 Hz–18 kHz (±2.5 dB)	115 dB	Electronic (3.5 kHz)	6.5" polymer composite
Genelec	1031AP	Ported	Powered	48 Hz–20 kHz (±2.5 dB)	120 dB	Electronic (2.5 kHz)	8" polymer composite
Genelec	1032A	Ported	Powered	42 Hz–20 kHz (±2.5 dB)	124 dB	Electronic (1.8 kHz)	10" polymer composite
Genelec	1037B	Ported	Powered	37 Hz–20 kHz (±2.5 dB)	127 dB	Electronic (420 Hz, 3.2 kHz)	12" cone
Genelec	1091A Active Subwoofer	Ported	Powered	38–85 Hz (±2.5 dB)	103 dB	Electronic (85 Hz)	8" cone
Genelec	1092A	Ported	Powered	33–85 Hz (±2.5 dB)	115 dB	Electronic (85 Hz)	Dual 8" cones

Midrange Size  
and TypeTweeter Size  
and TypeMagnetic  
ShieldingCabinet  
Dimensions  
(HxWxD)

Weight (lbs.)

Notes

Price  
(per pair)

N/A	1" soft dome, fluid cooled	Yes	17x11x13	27		\$1,529
N/A	1" soft dome, fluid cooled voice coil	Yes	18x11x15	42		\$3,599
N/A	1" soft dome using neodymium magnet	Yes	12x8x10	13		\$799
N/A	1" soft dome, fluid cooled	Yes	13x8x10	15		\$1,169
N/A	1" soft dome, fluid cooled	Yes	13x8x13	24		\$2,599
N/A	N/A	Yes	25x17x22	95	Active subwoofer system	\$2,999
N/A	1" soft dome, fluid cooled	Yes	8x18x12	31	Designed specifically for console-top use	\$3,199
N/A	1" soft dome, fluid cooled	Yes	17x12x16	48	Designed for mid-field or console-top use	\$4,199
3" soft dome; fluid cooled	1" soft dome, fluid cooled	Yes	13x27x20	77	Mid-field main monitor	\$6,579
2x6" polypropylene cone with 3" voice coil, fluid cooled	1" soft dome, fluid cooled	Yes	31x22x20	143	Main monitor	\$12,129
N/A	1" soft dome per channel	Yes (satellites)	Full-range satellites	91	2-channel passive crossover; total system can be powered by 2-channel amp	(2-channel system) \$1,792
7" carbon fiber cone	3" dome and wave guide	No	20x24x16.75	105	Mirror-imaged pairs available; full or biampified	\$3,178
N/A	1" soft dome	No	14.88x9.75x9.75	16	Mirror-imaged pairs available	\$704
N/A	1" soft dome	No	14.06x17x12.5	30	Mirror-imaged pairs available	\$824
7" carbon fiber cone	3" dome and wave guide	No	16x24x12.5	80	Mirror-imaged pairs available; full or biampified	\$2,560
N/A	1" superdome	No	17.25x12x11.125	27		\$684
N/A	1" tweeter w/Direktor	Yes	13.8x8.7x8.4	15.4		\$474
N/A	1" tweeter w/Direktor	Yes	15.8x10.7x8.5	16.7		\$568
N/A	Superdome (high-power)	No	7.25x12x11.13	28		\$918
N/A	1" superdome coupled to dispersion-control device	No	23.75x27x13	70	Step-down mode allows operation down to 25 Hz	\$1,610
N/A	1" ferrofluid-cooled silk dome	Yes	14.75x10.25x11.75	22	Front-mounted large-diameter; 5-way binding posts	\$399
N/A	1" ferrofluid-cooled silk dome	Yes	14.75x10.25x11.75	30	Low, high, trim controls; subsonic filter; RF prot; gold 1/4"/XLR combo connectors	\$999
N/A	1" ferrofluid-cooled silk dome	Yes	14.75x10.25x11.75	33 (pwr cab); 22 (pass cab)	Low, high, trim controls; subsonic filter; RF prot; gold 1/4"/XLR combo connectors; both amps in "P" unit; other amp drives 20/20	\$699
N/A	1" neodymium ferrofluid- cooled silk dome	Yes	VLF: 18.5x12x11; Satellite: 10.5x 7.5x9	VLF: 34; satellite: 11	3-way system w/2 satellites/1 very low-frequency station; low/high frequency; subsonic filter; RF prot; output-current limiting; gold combo 1/4"/XLR connectors	(3-piece system) \$999
4" full-range	N/A	Yes	6.5x4x5	7	Amplifier may be used independently	\$458
3" cone	1" dome	Yes	10x11.25x8.25	14	Woofer contains 15W amp, crossover, 5W amps x 2 for satellites	\$349
N/A	0.75" metal dome	Yes	10x6x7.25	12.5	XLR ins; pwr indctr; input-sens cntrls; amp/driver-prot; x-overs; EQ	\$1,080
N/A	0.75" metal dome	Yes	12.5x8x9.5	15	XLR ins; pwr indctr; input-sens cntrls; amp/driver-prot; x-overs; EQ	\$2,098
N/A	1" metal dome	Yes	15.5x10x11.5	26	XLR ins; power indicator; input-sensitive controls; amp/driver-prot, crossovers; EQ; avail in black (1031AP)	\$3,998
N/A	1" metal dome	Yes	19.5x12.63x11.5	44	XLR ins; pwr indctr; input-sens cntrls; amp/driver-prot; x-overs; EQ	\$4,998
5" cone	1" metal dome	Optional	26.75x15.75x15	82	XLR ins; pwr indctr; input-sens cntrls; amp/driver-prot; x-overs; EQ	\$9,498
N/A	N/A	No	20x10x9	22.5	XLR ins; power indicator; input-sensitive controls; amp/driver-prot; crossovers; bass roll-off EQ; for use w/1029As	each \$699
N/A	N/A	Optional	24.25x12.5x20	66	XLR ins; power indicator; input-sensitive controls; amp/driver-prot, crossovers; L-C-R in/out; LFE in	each \$2,150



# REFERENCE MONITORS

Manufacturer	Product	Enclosure Type	Powered/Unpowered	Frequency Response	Sensitivity	Crossover Frequency	Woofer Size and Type
Genelec	1094A Active Subwoofer	Ported	Powered	29-85 Hz ( $\pm 2.5$ dB)	120 dB	Electronic (85 Hz)	15"
Genelec	2029A Digital Monitor System	Ported	Powered	68 Hz-18 kHz ( $\pm 2.5$ dB)	110 dB	Electronic (3.3 kHz)	5" coated cones
Genelec	S30C	Ported	Powered	44 Hz-22 kHz ( $\pm 2.5$ dB)	124 dB	Electronic (420 Hz, 4 kHz)	8" cone
Hafler	TRM10s	Bass reflex	Powered	30 Hz-110 Hz ( $\pm 2$ dB)	N/A	Variable (40-110 Hz)	Down-firing 10" cellulose fiber cone
Hafler	TRM12s	Bass reflex	Powered	25-110 Hz ( $\pm 2$ dB)	N/A	Variable (40-110 Hz)	Down-firing 12" cellulose fiber cone
Hafler	TRM6	Bass reflex	Powered	55 Hz-21 kHz ( $\pm 2$ dB)	N/A	3.2 kHz	6" polypropylene cone
Hafler	TRM8	Bass reflex	Powered	45 Hz-21 kHz ( $\pm 2$ dB)	N/A	2.5 kHz	8" polypropylene cone
HHB	HHB Circle 3	2-way nonported	Powered or unpowered	70 Hz-20 kHz	83 dB	3.5 kHz	4.5" NRSC cone
HHB	HHB Circle 5	Ported	Powered or unpowered	48Hz-20kHz	87 dB	2.6 kHz	8" polymer cone
HHB	HHB Circle Powered Sub	Twin-chamber reflex	Powered	33 Hz-120 kHz	1VRMS	5 main channels use Sallen and Key filters @ 120 Hz	12" double magnet
Hot House	ARM 265 Active Reference Monitor	6th-order reflex, heavily braced, rear ported	Powered	30 Hz-20 kHz $\pm 1.75$ dB	Adjustable input gain, +4 or -10 line level	1.5 kHz	2x6.5" long throw
Hot House	ASB 110 Active Sub-Bass System	6th-order reflex	Powered	20-110 Hz	N/A	50-110 Hz	10" Hot House HV10
Hot House	ASB 112 Active Sub-Bass System	6th-order reflex	Powered	20-110 Hz	N/A	50-110 Hz	12" Hot House HV12
Hot House	ASB 115 Active Sub-Bass System	6th-order reflex	Powered	16-110 Hz	N/A	50-110 Hz	15" Hot House HV15 Pro
Hot House	ASB 212 Active Sub-Bass System	6th-order reflex	Powered	20-110 Hz	N/A	50-110 Hz	(2) 12" Hot House HV12
Hot House	PRM 165 Passive Reference Monitor	6th-order-reflex, heavily braced, rear ported	Unpowered	49 Hz-20 kHz $\pm 1.75$ dB	91 dB	2,400 Hz	6.5" long throw
JBL	4206	Bass reflex	Unpowered	65 Hz-20 kHz ( $\pm 2$ dB)	87 dB	2.8 kHz	6" woofer
JBL	4208	Bass reflex	Unpowered	60 Hz-20 kHz ( $\pm 2$ dB)	89 dB	2.8 kHz	8"
JBL	4408A	Bass reflex	Unpowered	50 Hz-20 kHz ( $\pm 2$ dB)	89 dB	2.5 kHz	8" cast frame
JBL	4410A	Bass reflex	Unpowered	45 Hz-20 kHz ( $\pm 2$ dB)	90 dB	900 Hz, 4 kHz	10" cast frame
JBL	4412A	Bass reflex	Unpowered	45 Hz-20 kHz ( $\pm 2$ dB)	89 dB	850 Hz, 4 kHz	12" cast frame
JBL	4425	Bass reflex	Unpowered	40 Hz-16 kHz ( $\pm 3$ dB)	91 dB	1.2 kHz	12" high-power
JBL	6208	Vented bass reflex	Powered	60 Hz-20 kHz ( $\pm 2$ dB)	89 dB	2.8 kHz	8"
JBL	Control	Bass reflex	Unpowered	70 Hz-20 kHz (-10 dB)	87 dB	6 kHz	5 1/4"
JBL	LSR12P	Subwoofer	Powered	28-80 Hz (-6 dB)	96 dB	85 Hz	12" neodymium differential drive
JBL	LSR28P	Bass reflex	Powered	50 Hz-20 kHz (+1, -1.5 dB)	89 dB	1.7 kHz	8" differential drive
JBL	LSR32	Bass reflex	Unpowered	60 Hz-20 kHz (+1, -1.5 dB)	90 dB	250 Hz, 2.2 kHz	12" neodymium differential drive
Klein + Hummel	O198	Sealed	Powered	50-20K ( $\pm 2$ dB)	N/A	650 Hz, 3.3 kHz	8" cone
Korg	RM8	Ported	Unpowered	48 Hz-20 kHz ( $\pm 3$ dB)	88 dB	2.8 kHz	7" copolymer with butyl surround
KRK	Exposé E7	Tuned port	Powered	100 $\pm 2$ dB-4 kHz 54 $\pm 3$ dB-20 kHz	+6 to -30 dB	2 kHz	7" Kevlar
KRK	Exposé E8	Tuned port	Powered	100 $\pm 1$ dB-4kHz 46 $\pm 2.5$ dB-22 kHz	+6 to -30 dB	1.7 kHz	8" Kevlar
KRK	K-Rok/S	Tuned port	Unpowered	57 Hz-19 kHz ( $\pm 3$ dB)	92 dB	2.5 kHz	7" latex-coated long stroke

Midrange Size and Type	Tweeter Size and Type	Magnetic Shielding	Cabinet Dimensions (HxWxD)	Weight (lbs.)	Notes	Price (per pair)
N/A	N/A	No	29x18.5x24.5	110	XLR ins; power indicator; input-sensitive controls; amp/driver-prot. crossovers; L-C-R in/out; LFE in	each \$3,699
N/A	0.75" metal dome	Yes	10x6x7.25	12.5	S/PDIF and XLR ins; all features of 1029A	
4" cone	9x65 mm ribbon tweeter (Genelec design)	Optional	19.5x12.63x11.5	44	XLR ins; power indicator; input-sensitive controls; amp/driver-protection, crossovers, EQ	\$5,598
N/A	N/A	No	14.75x16x16	60	200W Class G trans* ana amp; XLR and RCA ins; 90/180/270 degree phrasing	\$695
N/A	N/A	No	18x19.5x19.25	96	200W Class G trans* ana amp; XLR and RCA ins; 90/180/270 degree phrasing	\$795
N/A	1" soft dome	Yes	13.25x8.88x11.5	25	150W and 33W trans* ana amps	\$1,390
N/A	1" soft dome	Yes	15.69x10.25x13	35	150W and 75W trans* nova amps	\$1,990
N/A	1" soft dome neodymium magnet	Yes	10.6x6.9x7.8	8.1 (upowered); 11 (powered)	Powered amp w/antithump circ	Powered \$895; Unpowered \$449
N/A	1" soft dome with damping chamber	Yes	16.5x10x11.8	10 (upowered); 12.6 (powered)	Powered version: 2 channel amp; Class AB	Powered \$1,399 Unpowered \$749
N/A	N/A	No	18.3x16.3x16.3	47.3	Built-in 5 channel active filtering	\$1,399
N/A	1" recessed soft dome	N/A	25x14x12	52	Vertically aligned; adjustable LF/HF peak SPL per pair; 126 dB; available in black, red, golden oak	\$6,499
N/A	N/A	No	20x19x20	98	Stereo crossover with XLR and RCA I/O; HP/LP outs; sens/lvl mtchng; low-freq cont; 180-degree phase controls; peak SPL 118 dB	\$2,999
N/A	N/A	No	24x19x20	110	Stereo crossover w/ XLR & RCA I/O; HP/LP outs; sens/lvl mtchng; low-freq cont; 180-degree phase controls; peak SPL 120 dB	\$3,498 each
N/A	N/A	No	24x19x20	125	Stereo crossover with XLR and RCA I/O; HP/LP outs; sens/lvl mtchng; low-freq cont; 180-degree phase controls	\$3,999 each
N/A	N/A	No	37x17x31	185	Stereo crossover with XLR and RCA I/O; HP/LP outs; sens/lvl mtchng; low-freq cont; 180-degree phase controls; peak SPL 126 dB	\$4,999 each
N/A	1" recessed soft dome	Yes	212.5x8.5x13	25	Req 100–300W of high quality amplification for ruler-flat mastering performance	\$1,299
N/A	1" titanium	Yes	15.38x9x9.5	15	Multiradial baffle	\$388
N/A	1" titanium	Yes	17.75x11.25x9.5	20.5	Multiradial baffle	\$510
N/A	1" pure titanium dome	No	17.25x11.63x12	26	Mirror-image pairs	\$674
5" cast frame	1" pure titanium dome	No	23.5x14.25x11.25	43	Mirror-image pairs	\$934
5" cast frame	1" pure titanium dome	No	14.25x23.5x11.25	47	Mirror-image pairs in horizontal configuration	\$1,402
N/A	2" compression driver on 100°x100° horn	No	25x16x14.75	57		\$2,388
N/A	1" gold/titanium hybrid dome	Yes	17.75x11.25x9.5	30	Biampified with multiradial baffle	\$948
N/A	0.75" polycarbonate	Yes	9.25x6.25x5.63	4	Multimedia brackets and adapters available	\$308
N/A	N/A	No	15.5x25x11.5	50	Integrated bass-management system	\$1,099
N/A	1" titanium composite on wave guide	No	13x16x12.75	50	Carbon fiber composite baffle	\$1,998
5" neodymium w/2" voice coil	1" titanium composite on wave guide	No	15.5x25x11.5	47	Carbon fiber composite baffle	\$1,998
3" cone	1" dome	Yes	10x15x11.5	30.8	Active 3-way with HF wave guide; hard limiters; max SPL 110 dB @ 1 meter	\$4,000
N/A	1" Korte! soft dome	Yes	8.5x15x10.5	16		\$420
N/A	1" Kevlar	Optional	15x13.25x12	50		\$2,995
N/A	1" Kevlar	Optional	17x15.25x14.5	61		\$3,695
N/A	1" silk dome	Optional	14x12x9.75	46 (pair)		\$495 (\$645 shielded)



# REFERENCE MONITORS

Manufacturer	Product	Enclosure Type	Powered/Unpowered	Frequency Response	Sensitivity	Crossover Frequency	Woofer Size and Type
KRK	M6000/S	Tuned port	Unpowered	62 Hz–20 kHz	89 dB	2.4 kHz	6" polyglass
KRK	M7000B/BS	Tuned port	Unpowered	50 Hz–20 kHz	91 dB	3 kHz	7" Kevlar
KRK	M9000B/S	Tuned port	Unpowered	45 Hz–20 kHz ( $\pm 3$ dB)	92 dB	2.9 kHz	9" composite
KRK	Rokit Personal Shielded Monitor	Tuned port	Unpowered	69 Hz–24 kHz ( $\pm 2$ dB)	91 dB	1.5 kHz	6.5" long-stroke polyvinyl
KRK	S10	Tuned port	Powered	30 Hz–50 kHz, -130 kHz variable ( $\pm 2$ dB)	+6 to -30 dB	80 kHz fixed	10" woven Kevlar
KRK	V6	Tuned port	Powered	30 Hz–50 kHz, -130 Hz variable ( $\pm 2$ dB)	+6 to -30 dB	80 Hz fixed	10" woven Kevlar
KRK	V8	Tuned port	Powered	47 Hz–23 kHz ( $\pm 2$ dB)	+6 to -30 dB	1.66 kHz	8" woven Kevlar
KRK	V88	Tuned port	Powered	35 Hz–2 kHz ( $\pm 2$ dB)	+6 to -30 dB	1.83 kHz	8" woven Kevlar
Mackie Designs	HR824	Sealed	Powered	39 Hz–20 kHz ( $\pm 1.5$ dB)	>120 dB @ 1W/1m	2 kHz	8.75" mineral-filled polypropylene cone
Meyer Sound	HD-1	Tuned bass reflex	Powered	32 Hz–22 kHz	N/A	N/A	8" cone driver (bass reflex)
Meyer Sound	HM-1S	Tuned bass reflex	Powered	42 Hz–20 kHz	N/A	3 kHz	7" graphite cone driver
M&K Professional	MPS-1510	Sealed cabinet	Unpowered	80 Hz–20 kHz	90 dB	1,800 Hz	5.25"
M&K Professional	MPS-1520 Center Channel	Sealed cabinet	Unpowered	80 Hz–20 kHz	90 dB	1,800 Hz	(2) 5.25"
M&K Professional	MPS-1525 Tripole Surround	Sealed cabinet	Unpowered	80 Hz–20 kHz	90 dB	1,800 Hz	(2) 5.25"
M&K Professional	MPS-1625 Tripole Surround	Sealed cabinet	Unpowered	80 Hz–20 kHz	90 dB	1,800 Hz	6.5"
M&K Professional	MPS-1650	Sealed cabinet	Unpowered	80 Hz–20 kHz	90 dB	1,800 Hz	6.5"
M&K Professional	MPS-2510	Sealed cabinet	Unpowered	77 Hz–20 kHz $\pm 2$ dB	90 dB	1.5 kHz	(2) 5.25"
M&K Professional	MPS-2510 Powered	Sealed cabinet	Powered	77 Hz–20 kHz $\pm 2$ dB	90 dB	1.5 kHz	(2) 5.25"
M&K Professional	MPS-2525 Tripole Surround	Sealed cabinet	Unpowered	80 Hz–20 kHz	90 dB	1,800 Hz	(2) 5.25"
M&K Professional	MPS-2550	Sealed cabinet	Unpowered	77 Hz–20 kHz $\pm 2$ dB	90 dB	200 Hz and 1500 Hz	(2) 6.5"
M&K Professional	MPS-2575 Tripole Surround	Sealed cabinet	Unpowered	80 Hz–20 kHz	90 dB	1,800 Hz	(2) 6.5"
M&K Professional	MPS-2810 Subwoofer	Sealed cabinet	Powered	20–125 Hz	N/A	N/A	(2) 8"
M&K Professional	MPS-5150 Subwoofer	Sealed cabinet	Powered	20–125 Hz	N/A	N/A	(2) 12"
M&K Professional	MPS-5310 Subwoofer	Sealed cabinet	Powered	20–125 Hz	N/A	N/A	(2) 12"
M&K Professional	MPS-5320 Subwoofer	Sealed cabinet	Powered	20–125 Hz	N/A	N/A	(2) 12"
M&K Professional	MPS-5410 Subwoofer	Sealed cabinet	Powered	18–125 Hz	N/A	N/A	(2) 12"
M&K Professional	MPS-5420 Subwoofer	Sealed cabinet	Powered	18–125 Hz	N/A	N/A	(2) 12"
NHT Pro	NHTPro A-10	2-way, sealed	Dedicated outboard amplifier included	50 Hz–20 kHz	116 dB peak output (100 ms pink noise @ 1m)	0.2 kHz	6.5" paper cone
NHT Pro	NHTPro A-20	2-way, sealed	Dedicated outboard amplifier included	40 Hz–20 kHz	117 dB peak output (100 ms pink noise @ 1m)	0.2 kHz	6.5" paper cone
NHT Pro	NHTPro M-00	2-way, sealed cast aluminum	Powered	80 Hz–20 kHz	111 dB peak output (100 ms pink noise @ 1m)	2.2 kHz	4.5" paper cone
Paradigm Reference	Active/40	Bass reflex	Powered	38 Hz–22 kHz ( $\pm 1$ dB)	N/A	1.5 kHz	6.5" polypropylene cone
Paradigm Reference	Active/20	Bass reflex	Powered	35 Hz–22 kHz ( $\pm 1$ dB)	N/A	1.5 kHz	6.5" mica-polymer cone

Midrange Size and Type	Tweeter Size and Type	Magnetic Shielding	Cabinet Dimensions (HxWxD)	Weight (lbs.)	Notes	Price (per pair)
N/A	1" Kevlar	Optional	13x9x10	36		\$775 (shielded) \$925
N/A	1" Kevlar	Optional	14.25x11x11	50		\$1,175 (shielded) \$1,325
N/A	1" Kevlar	Optional	17x14x14.25	88		\$1,995 (shielded) \$2,195
N/A	1" silk dome	Yes	12.5x10.5x8	29 (pair)		\$329
N/A	N/A	No	13x18.75x17	53 (pair)		\$799
N/A	N/A	No	13.17x18.75x17	53 (pair)		\$799
N/A	1" silk dome	Yes	N/A	38 (pair)		\$1,249
N/A	1.25" silk dome	Yes	N/A	50 (pair)		\$1,599
N/A	1" aluminum-alloy, ferrofluid-cooled coil	Yes	15.75x10x10.5	32	Rear mass-loaded passive radiator	\$1,498
N/A	1" silk dome	Optional (direct radiating)	16x12x14 (+2" for amp chassis)	51		\$5,520
N/A	1" soft-dome tweeter	Yes	11.5x8.9x9.7	11	Optional PS-1 power supply (\$400) and subwoofer (\$650)	\$2,600
N/A	1" soft dome	Yes	10.5x6.25x7.4	9		(each) \$450
N/A	1" soft dome	Yes	5.6x6.18x8.25	17	Horizontal center channel monitor	(each) \$600
(2) 3.5"	1" soft dome	Yes	10.5x8.5x6	11	Switchable power response	\$1,250
(4) 3.5"	1" soft dome	Yes	12.6x10.5x8	14	Switchable power response	\$1,600
N/A	1" soft dome	Yes	12.6x18.4x7.5	12		(each) \$750
N/A	(3) 1" soft dome	Yes	12.5x10.5x12	24	THX PM3 approved; user selectable wide/narrow vertical directivity	(each) \$900
N/A	(3) 1" soft dome	Yes	12.5x10.5x12	24	THX PM3 approved; user selectable wide/narrow vertical directivity	(each) \$1,500
(4) 3.5"	(3) 1" soft dome	Yes	12.5x10.5x12	26	Tripole surround monitor; switchable power response	\$2,500
(2) 5.25"	(3) 1"	Yes	12.5x10.5x14	32	User selectable vertical directivity, stacking capability	(each) \$1,250
(2) 5.25"; (2) 3.5"	(5) 1" soft dome	Yes	12.38x10.5x14	36	Tripole surround monitor; switchable power response	\$2,900
N/A	N/A	Yes	14.5x17.5x12.125	41	Dual driver push-pull; MPS-2810R for rack mounting; headroom maximizer; backfire design	\$1,500
N/A	N/A	Yes	23.25x15.5x19.625	72	Dual driver push-pull; MPS-2810R for rack mounting; headroom maximizer; XLR in; THX PM3 approved	\$1,500
N/A	N/A	Yes	23.25x15.5x19.625	82	Dual driver push-pull design; headroom maximizer; XLR in; THX PM3 app	\$2,000
N/A	N/A	Yes	23.25x15.5x19.625	82	Dual driver push-pull design; headroom maximizer; XLR in; THX PM3 app; backfire design	\$2,100
N/A	N/A	Yes	23.25x15.5x26	115	Dual driver push-pull design; headroom maximizer; XLR in; THX PM3 app	\$3,000
N/A	N/A	Yes	23.25x15.5x26	115	Dual driver push-pull design; headroom maximizer; XLR in; THX PM3 approved; backfire design	\$3,100
N/A	1" ferrofluid-cooled, soft dome	Yes	12x7.5x10.75 Amp dimensions 3.5x19x12.75	14 (amp 29)	XLR/TRS in; output (amp-monitors) include: XLR cables; controls; listening position: near field/mid field; wall proximity -0/1; input sensitive—10/-3/+4,+11 dBu, mute	\$1,200
N/A	1" ferrofluid-cooled, metal dome	Partial	3.5x19x12.75	17	XLR/TRS in; output (amp-monitors)-XLR cables; cntrls: lstrng pstn-NF/MF, wall prox-0/1, inpt sensi—10/-3/+4,+11 dBu, mute, LED readout-SPL, VAC; heat sink temp	\$2,000
N/A	1" ferrofluid-cooled, soft dome	Yes (including transformer)	9x5.7x7.3	14	Inputs-XLR, TRS, RCA; cntrls-NF/MF, +4/-10 dBu, auto power	\$750
N/A	1" pure aluminum dome	Yes	21x8x11.5	88	Biampified: 125 W/woofer pr, 50 W/tweeter	\$2,000
N/A	1" pure aluminum dome	No	14x8.25x11	70	Biampified: 110 W/woofer pr, 50 W/tweeter	\$1,700



# REFERENCE MONITORS

Manufacturer	Product	Enclosure Type	Powered/Unpowered	Frequency Response	Sensitivity	Crossover Frequency	Woofer Size and Type
Paradigm Reference	Mini Monitor	Bass reflex	Unpowered	43 Hz–20 kHz ( $\pm 2$ dB)	89 dB	1.8 kHz	6.5" injection-molded copolymer polypropylene
Paradigm Reference	Monitor 3	Bass reflex	Unpowered	36 Hz–20 kHz ( $\pm 2$ dB)	89 dB	1.8 kHz	6.5" copolymer polypropylene
Paradigm Reference	Studio/20	Bass reflex	Unpowered	40 Hz–22 kHz ( $\pm 2$ dB)	89 dB	1.8 kHz	6.5" mica-polymer cone
Platinum Audio	Session-1 Monitors	Tuned port	Unpowered	40 Hz–20 kHz ( $\pm 2$ dB)	84 dB	2.5 kHz	Platinum 5" aluminum diaphragm/butyl surround
PMC	IB-1	Transmission line	Unpowered	25 Hz–25 kHz	91 dB	380 Hz, 3.8 kHz	10" flat carbon fiber Nomey piston driver
PMC	LB-1	Transmission line	Powered or unpowered	35 Hz–25 kHz	87 dB	2.5 kHz	5" 1 kW pulse, 3" voice coil
PMC	MB-1	Transmission line	Unpowered	20 Hz–25 kHz	91 dB	380 Hz, 3.8 kHz	12" radial driver
PMC	TB-1S	Transmission line	Powered or unpowered	40 Hz–25 kHz	90 dB	3 kHz	6.5" doped-cast magnesium
PMC	XB-1 Subwoofer	Transmission line	Powered or unpowered	25–200 Hz	90 dB	100 Hz	Dual 10" die-cast voice coil
Quested	F 11	Bass reflex	Powered	65 Hz–20 kHz ( $\pm 2$ dB)	N/A	N/A	6.5" custom
Quested	H108	Bass reflex	Unpowered	55 Hz–18 kHz	90.5 dB	N/A	8" bass driver
Quested	UD-1	Bass reflex	Unpowered	45 Hz–20 kHz	92 dB	N/A	(2) 8"
Quested	VH3208	Bass reflex	Unpowered	55 Hz–18 kHz ( $\pm 2$ dB)	92 dB	N/A	2x8" bass drivers
Quested	VS2108	Bass reflex	Powered	55 Hz–18 kHz ( $\pm 2$ dB)	N/A	N/A	8" bass cone
Quested	VS2205	Bass reflex	Powered	75 Hz–19 kHz ( $\pm 2$ dB)	N/A	N/A	2x5 bass cone
Roland	DS-90 24-bit Digital Reference Monitor	Bass reflex	Powered	Flat, w/user-adjustable settings	0 dBm (0.775 Vrms)	2.6 kHz, active 4th order	6.5" polypropylene cone
Shedworks	Bath Camera	Sealed	Unpowered	40 Hz–20 kHz ( $\pm 3$ dB)	84 dB	280 Hz, 4 kHz	6.5" poly cone, rubber surround
Shedworks	TLC-3	Sealed	Unpowered	60 Hz–20 kHz ( $\pm 3$ dB)	84 dB	280 Hz, 4 kHz	6.5" paper-cone foam surround
Soundtech	ST5T	Ported	Unpowered	80 Hz–20 kHz	93 dB	4.5 kHz	5" polypropylene
Soundtech	ST8T	Ported	Unpowered	55 Hz–20 kHz	95 dB	3 kHz	8" impregnated paper
Spirit	Absolute Two	Front vented	Unpowered	45 Hz–20 kHz	90 dB	2.5 kHz	6.5"
Spirit	Absolute Zero	Rear vented	Unpowered	55 Hz–18 kHz (+1 dB/-3 dB)	89 dB	2.5 kHz	6.5"
Studer	A1 Active Closefield	Ported	Powered	58 Hz–22 kHz	0.775V for 100 dB SPL @ 1m	3.5 kHz	142 mm
Studer	A3 Active Nearfield	Ported	Powered	43 Hz–23 kHz	0.775V for 100 dB SPL @ 1m	2.2 kHz	215 mm
Studer	A5 Active Main	Ported	Powered	38 Hz–23 kHz	0.775V for 100 dB @ 1m	450 Hz, 3 kHz	250 mm
Sumiko	Sonus Faber Concertino	Bass reflex	Unpowered	55 Hz–20 kHz ( $\pm 3$ dB)	86 dB	N/A	5.5" PP-treated cone
Sumiko	Sonus Faber Concerto	Bass reflex	Unpowered	45 Hz–20 kHz ( $\pm 3$ dB)	87 dB	N/A	7" cellulose carbonium 7 cone
Sumiko	Sonus Faber Concerto Grand Piano	Sealed	Unpowered	40 Hz–20 kHz ( $\pm 3$ dB)	87 dB	N/A	7" copper ring system, cell carbonium 7 cone; 7" acrilate carbonium 7 cone passive radiator
Sumiko	Sonus Faber Solo	Sealed	Unpowered	45 Hz–20 kHz ( $\pm 3$ dB)	86 dB	N/A	2x7" cellulose carbonium 7 cone
Sumiko	Vienna Acoustics Bach	Bass reflex	Unpowered	38 Hz–20 kHz ( $\pm 3$ dB)	90 dB	N/A	7" paper cone
Sumiko	Vienna Acoustics Beethoven	Bass reflex	Unpowered	30 Hz–22 kHz ( $\pm 3$ dB)	91 dB	N/A	2x5.5 XPP cone; 2x7 XPP "spider" cone

Midrange Size and Type	Tweeter Size and Type	Magnetic Shielding	Cabinet Dimensions (HxWxD)	Weight (lbs.)	Notes	Price (per pair)
N/A	N/A	Yes	13x8x10.875	31		\$329
N/A	1" titanium dome	No	20x9.25x11.375	48		\$399
N/A	1" pure aluminum dome	Yes	14x8.25x11	40		\$750
N/A	Platinum 1-pc 1" aluminum dome, coil bobbin	Optional	13.5x8x13	26.5	2-way crossover, nominal impedance 6Ω	\$1,295
3" fabric dome	Silk soft dome with double chamber	Optional	30x13x21	65		\$4,400
N/A	Silk soft dome with double chamber	Optional	21x7x10.5	Powered: 27; unpowered: 17		\$3,660 (unpowered) \$2,160
3" fabric dome	Silk soft dome with double chamber	Optional	34x15x21	105	Available as fully active system (including all electronics and cables)	\$8,950
N/A	Aluminum alloy phase shield ferrofluid	Optional	15.75x7.5x11.75	Powered: 30; unpowered: 20		\$2,420 (unpowered) \$920
N/A	N/A	No	31x17x10.5	Powered: 71; unpowered: 60		\$2,000 (\$1,250 unpowered)
N/A	28 mm soft dome	Yes	12.5x8.5x11.75	24	Bass/treble, level control, integrated mounting points	\$1,960
N/A	1.125" high-frequency soft dome	Optional	15.75x9.5x9.38	26.5		\$1,780
3"	28 mm	Yes	47.25x16.25x13.25	95	TRI wireable; available in a variety of veneer finishes	\$6,420
3" midrange soft dome	1.125" high-frequency soft dome	Yes	18.25x21.25x14	72.5		\$4,730
N/A	1.125" high-frequency soft dome	Yes	16x13.5x13.5	48.5		\$4,680
N/A	1.125" high-frequency soft dome	Yes	10.5x13.5x11.25	29		\$3,490
N/A	1" soft dome	Yes	14.63x9x12.56	24.25	24-bit digital ins (S/PDIF) on each speaker	\$1,190
5.25" poly cone, rubber surround	0.75" phase correct soft dome	No	11x8.5x9.5	34	Rear-firing woofer; phase correct crossovers; Zolatone finish; gold 5-way binding posts	\$699
5.25" paper cone, rubber surround	0.75" phase correct soft dome	No	8.5x9.5x9.5	17	Downfiring woofer; phase correct crossovers; Zolatone finish; gold 5-way binding posts	\$699
N/A	1" polycarbonate	No	9.25x6.25x5.5	5.25	Mounting brackets available	\$199.90
N/A	1" linen	No	15.63x10x15.8	13.2	Mounting brackets available	\$399.90
N/A	1" ferrofluid-coated soft dome	Yes	15.5x9.25x11	15.5	Allows biwired and standard connections; front-port design	\$499.95
N/A	1" ferrofluid-coated soft dome	No	12.8x9.2x11.6	24	British red cones, rear port	\$349.95
N/A	70 mm	Yes	242x162x170 mm	11		l.b.a.
N/A	100 mm	Yes	400x250x305 mm	28		l.b.a.
142 mm	100 mm	Yes	590x320x380 mm	66		\$3,425
N/A	0.75" silk dome, ferrofluid	No	12.5x8.5x11.5	16	Walnut finish; Piano Black Lacquer finish available (\$1,200)	\$995
N/A	0.75" silk dome, ferrofluid	Yes	13.5x8.75x14.25	24.25	Walnut finish; Piano Black Lacquer finish available (\$2,100)	\$1,850
N/A	0.75" silk dome, ferrofluid	Yes	11.5x9.5x39.5	59.5	Piano Black Lacquer finish	\$3,500
N/A	0.75" silk dome, ferrofluid	Yes	9.25x21.75x8.75	11	Center channel speaker	\$995
N/A	1" silk dome, ferrofluid	Yes	33.7x7.5x9.8	34		\$1,500
N/A	1" silk dome, ferrofluid	No	44x7.5x14.3	54		\$3,990



# REFERENCE MONITORS

Manufacturer	Product	Enclosure Type	Powered/Unpowered	Frequency Response	Sensitivity	Crossover Frequency	Woofer Size and Type
Sumiko	Vienna Acoustics Center Speaker	Bass reflex	Unpowered	42 Hz–20 kHz ( $\pm 3$ dB)	89 dB	N/A	5.5" XPP cone
Sumiko	Vienna Acoustics Haydn	Bass reflex	Unpowered	42 Hz–20 kHz ( $\pm 3$ dB)	89 dB	N/A	5.5" XPP cone
Sumiko	Vienna Acoustics Mozart	Bass reflex	Unpowered	35 Hz–22 kHz ( $\pm 3$ dB)	90 dB	N/A	2x5.5" XPP cone
Sundholm Acoustics	Sundholm SL 10.0 P/sub	Ported reflex-front panel	Powered	32 Hz–100 kHz ( $\pm 3$ dB)	88 dB	Variable: 50 Hz–100 Hz	10" poly cone
Sundholm Acoustics	SL 10.0 sub	Ported reflex front panel	Powered	36 Hz–100 kHz ( $\pm 3$ dB)	88 dB	N/A	10" poly cone
Sundholm Acoustics	SL 6.5W	Ported reflex front panel	Unpowered	45 Hz–20 kHz ( $\pm 2$ dB)	88 dB	2.5 kHz	6.5" polycone
Sundholm Acoustics	SL 6.5W/s	Ported reflex front panel	Unpowered	45 Hz–20 kHz ( $\pm 2$ dB)	88 dB	2.5 kHz	6.5" polycone
Sundholm Acoustics	SL 8.0	Ported reflex front panel	Unpowered	45 Hz–20 kHz ( $\pm 3$ dB)	88 dB	2.5 kHz	8" polycone
Tannoy	PS110-B	Vented	Powered	31 Hz–150 kHz	N/A	Continuously variable: 40–150 Hz	10" direct radiating
Tannoy	PS115-B	Vented	Powered	33–130 Hz	N/A	130 Hz	15" direct radiating
Tannoy	Reveal	Rear ported	Unpowered	60 Hz–20 kHz	90 dB SPL	3,000 kHz	6.5" bilaminate shielded bass driver
Tannoy	Reveal Active	Rear ported	Powered	62 Hz–20 kHz	N/A	3,000 kHz	6.5" bilaminate shielded bass driver
Tannoy	System 600	Front ported	Unpowered	52 Hz–20 kHz ( $\pm 3$ dB)	90 dB	1.8 kHz	6" dual concentric
Tannoy	System 600A	Front ported	Powered	44 Hz–20 kHz ( $\pm 3$ dB)	N/A	1,600 kHz	6.5" Tannoy dual concentric
Tannoy	System 800	Front ported	Unpowered	47 Hz–20 kHz ( $\pm 3$ dB)	92 dB	1.8 kHz	N/A
Tannoy	System 800A	Front ported	Powered	44 Hz–20 kHz	N/A	1,600 kHz	8" Tannoy dual concentric
Posthorn Recordings	Waveform Mach 17	Sealed	Unpowered	17 Hz–22 kHz	89 dB	120 Hz, 7.6 kHz	(2) 12" cone
Westlake Audio	BB10-SWWP	Bass reflex	Powered	26 Hz–20 kHz	96.5 dB @ 1m for 2.83V input	68 Hz	18"
Westlake Audio	BBSM-10	Bass reflex	Powered	50 Hz–18 kHz	95 dB @ 1m for 2.83V input	600 Hz, 4 kHz	10"
Westlake Audio	BBSM-12	Bass reflex	Powered	50 Hz–18 kHz	97 dB @ 1m for 2.83V input	500 Hz, 4 kHz	(2) 12"
Westlake Audio	BBSM-4	Bass reflex	Powered	65 Hz–20 kHz	89 dB @ 1m for 2.83V input	1.5 kHz	4" polypropylene
Westlake Audio	BBSM-5	Bass reflex	Unpowered	55 Hz–20 kHz ( $\pm 3$ dB)	90 dB @ 1m for 2.83V input	1.2 kHz	5" polyglass
Westlake Audio	Lc265.1	Bass reflex	Powered	48 Hz–18 kHz	91 dB @ 1m for 2.83V input	180 Hz, 4 kHz	6" polypropylene (2) 6.5" polypropylene
Westlake Audio	Lc3w10	Bass reflex	Powered	42 Hz–20 kHz	88 dB @ 1m for 2.83V input	160 Hz, 4.5 kHz	10" polypropylene
Westlake Audio	Lc3w12	Bass reflex	Powered	40 Hz–18 kHz	91 dB @ 1m for 2.83V input	160 Hz, 4.5 kHz	12" polypropylene
Westlake Audio	Lc6.75	Bass reflex	Powered	60 Hz–18 kHz	87.5 dB @ 1m for 2.83V input	4 kHz	6.5" polypropylene
Westlake Audio	Lc8.1	Bass reflex	Powered	55 Hz–18 kHz	90.5 dB @ 1m for 2.83V input	3.6 kHz	8" polypropylene
Yamaha	MS20S	Bass reflex	Powered	70 Hz–15 kHz	88 dB	3.5 kHz	4.67" cone
Yamaha	MS60S	Bass reflex	Powered	20 Hz–20 kHz	91 dB	3 kHz	8" cone
Yamaha	NS10M Studio	Sealed	Unpowered	60 Hz–20 kHz	90 dB	2 kHz	7" cone
Yorkville Sound	YSM-1	Bass reflex	Unpowered	40 Hz–20 kHz	90 dB	2.5 kHz	6.5" stamped, proprietary, foam surround
Yorkville Sound	YSM-2	Bass reflex	Unpowered	80 Hz–20 kHz	90 dB	2.2 kHz	5.25" stamped, proprietary, foam surround
Yorkville Sound	YSM-3	Bass reflex	Unpowered	35 Hz–20 kHz	89 dB	700 Hz, 3 kHz	12" stamped, proprietary, foam surround
Yorkville Sound	YSM-4	Bass reflex	Unpowered	50 Hz–18 kHz	88 dB	3 kHz	4" stamped, proprietary, foam surround, polymer

Midrange Size and Type	Tweeter Size and Type	Magnetic Shielding	Cabinet Dimensions (HxWxD)	Weight (lbs.)	Notes	Price (per pair)
N/A	1" silk dome, ferrofluid	Yes	13.6x6.7x10.2	19	Center channel speaker	\$500
N/A	1" silk dome, ferrofluid	No	13.6x6.7x10.2	19		\$895
N/A	1" silk dome, ferrofluid	No	37x6.7x11.6	44		\$2,500
N/A	N/A	No	29 x 12 x 15.25	55	Stereo pair serve as speaker stand for full-range monitors	\$1,795
N/A	N/A	No	29x12x15.25	45	Stereo pair serve as speaker stand for full-range monitors	\$1,295
N/A	1" silk dome tweeter	No	15.5x10.6x11.6	25	Biwire connector	\$795
N/A	1" aluminum dome tweeter	Yes	15.5 x10.6x11.6	28	Biwire connector	\$2,095
N/A	1" aluminum dome tweeter	No	15.5 x12x14.25	35	Biwire connector	\$995
N/A	N/A	Optional	17.5x11.83x16.5	33		each \$499
N/A	N/A	Optional	18x20x21	53		each \$1,299
N/A	1" silk soft dome sweeter	Yes	13.38x8.25x10.25	15.5		\$399
N/A	1" silk soft dome sweeter	Yes	13.38x8.25x10.25	18.5		\$899
N/A	N/A	Optional	8.6x14.1x10.5	16.5		\$695
N/A	N/A	Yes	8.63x14.13x11.38	21		\$1,595
8" dual concentric	N/A	Optional	10.8x17.7x10.5	23		\$995
N/A	N/A	Yes	10.7/8x17.3/4x11.3/8	28.5		\$1,995
5" cone	3" cone	No	24x24x43	110	Triamplified	\$6,000
N/A	N/A	N/A	30x28.5x23.5	275	Electro-mechanical-acoustical dampening; integrated passive crossover for single/bi-amp operation	\$9,850
6.5"	1.25" dome	N/A	16x30x21.75	150	Electro-mechanical-acoustical dampning; intgrtd passive crossover for single/bi-amp operation	\$4,896
6.5"	1.25"	N/A	19x34x23	220	Electro-mechanical-acoustical dampening; integrated passive crossover for single/bi-amp operation	\$6,898
N/A	0.75" dome	N/A	8x15x10	31	Electro-mechanical-acoustical dampening; integrated passive crossover for single/bi-amp operation	\$2,250
N/A	0.75" dome	N/A	10x18x11.75	42	Electro-mechanical-acoustical dampening; integrated passive crossover for single/bi-amp operation	\$2,699
5"	1" coaxial	N/A	8.5x22x11	42	Electro-mechanical-acoustical dampening; integrated passive crossover for single/bi-amp operation	\$1,347
5"	0.75" dome	N/A	12.25x21.5x13.38	69	Electro-mechanical-acoustical dampening; integrated passive crossover for single/bi-amp operation	\$2,759
6"	1" dome	N/A	15x25x15.5	107	Electro-mechanical-acoustical dampening; integrated passive crossover for single/bi-amp operation	\$3,399
N/A	0.75" dome	Optional	16x8x10.37	21.5	Electro-mechanical-acoustical dampening; align signal path	\$1,199
N/A	1" dome	Optional	18x10x11.63	31	Electro-mechanical-acoustical dampening; align signal path	\$1,499
N/A	1.2" dome speaker	Yes	5.5x11.375x7.75	8.8	Active Servo technology for extended bass response	\$249 each
N/A	0.75" dome tweeter with horn	Yes	17.5x10.5x9.5	22	Active Servo technology for extended bass response	\$599 each
N/A	1.2" soft dome	No	15x8.5x7.88	13.9		\$478
N/A	1" soft dome	Optional	16x9.5x9	18	2" forward-firing port, binding posts	\$280
N/A	0.75" soft dome	N/A	13x7x8	9	Binding posts	\$210
5.5" stamped, proprietary polymer	1" hyperbolic dome	N/A	25.75x16.8x11.5	45		\$998
N/A	0.75" dome	N/A	9x6x6	5.5		\$158



# HEADPHONES

Manufacturer	Model	Type	Frequency Response	Sensitivity (dB per mW)	Impedance ( $\Omega$ )
AKG	K 1000	Dynamic transducer w/VLD magnet	30 Hz–25 kHz	74	120
AKG	K 100	Dynamic	20 Hz–28 kHz	103	100
AKG	K 141 M	Dynamic	20 Hz–20 kHz	98	600
AKG	K 240 DF	Dynamic	20 Hz–20 kHz	88	600
AKG	K 240 M	Dynamic	15 Hz–20 kHz	88	600
AKG	K 270 S	Dynamic	20 Hz–28 kHz	92	75
AKG	K 301	Dynamic	20 Hz–25 kHz	94	100
AKG	K 70	Dynamic	20 Hz–20 kHz	105	100
Audio-Technica	ATH-910	Dynamic	20 Hz–22 kHz	92	40
Audio-Technica	ATH-M40is	Dynamic	5 Hz–28 kHz	100	60
beyerdynamic	DT-131	Dynamic	30 Hz–18 kHz	N/A	40
beyerdynamic	DT-150	Dynamic	10 Hz–30 kHz	N/A	250
beyerdynamic	DT-250	Dynamic	10 Hz–30 kHz	98	80
beyerdynamic	DT-770 Pro	Dynamic	5 Hz–35 kHz	N/A	600
beyerdynamic	DT-990 Pro	Dynamic	5 Hz–35 kHz	N/A	600
Fostex	T-20RP	Printed ribbon	50 Hz–30 kHz	96	50
Fostex	T-40RP	Printed ribbon	30 Hz–20 kHz	98	50
Fostex	T-5	Dynamic	65 Hz–20 kHz	96	50
Fostex	T-7	Dynamic	50 Hz–20 kHz	98	50
Koss	A/130	Dynamic	16 Hz–23 kHz	98	60
Koss	A/200	Dynamic	18 Hz–25 kHz	98	60
Koss	A/250	Dynamic	16 Hz–25 kHz	98	60
Koss	R/10	Dynamic	22 Hz–20 kHz	103	60
Koss	R/100	Dynamic	16 Hz–22 kHz	85	60
Koss	R/20	Dynamic	20 Hz–22 kHz	101	60
Koss	R/200	Dynamic	18 Hz–23 kHz	84	60
Koss	R/30	Dynamic	18 Hz–20 kHz	106	60
Koss	R/35	Dynamic	20 Hz–22 kHz	101	60
Koss	R/40	Dynamic	18 Hz–20 kHz	90	60
Koss	R/45	Dynamic	20 Hz–22 kHz	85	60
Koss	R/80	Dynamic	16 Hz–22 kHz	101	60
Koss	R/90	Dynamic	18 Hz–23 kHz	100	60
Koss	TD/61	Dynamic	25 Hz–15 kHz	93.5	38
Koss	TD/65	Dynamic	20 Hz–17 kHz	101	90
Koss	TD/80	Dynamic	20 Hz–17 kHz	98	60
Radial Engineering	MB Quart QP160	Dynamic	30 Hz–26.4 kHz	90	40
Radial Engineering	MB Quart QP200	Dynamic	24 Hz–20 kHz	97	100
Radial Engineering	MB Quart QP220	Dynamic	20 Hz–20.1 kHz	90	100
Radial Engineering	MB Quart QP240	Dynamic	24 Hz–20.1 kHz	98	100
Radial Engineering	MB Quart QP250	Dynamic	13 Hz–20.4 kHz	98	100
Radial Engineering	MB Quart QP400	Dynamic	14 Hz–24.1 kHz	93	300
Radial Engineering	MB Quart QPH805	Dynamic	10 Hz–33.4 kHz	96	300
Radial Engineering	MB Quart QR 280	Dynamic	16 Hz–23.5 kHz	96	300
Roland	RH-120	Dynamic	20 Hz–20 kHz	100	40
Roland	RH-80	Dynamic	20 Hz–20 kHz	94	40
Sennheiser	HD 25	Dynamic	16 Hz–22 kHz	120	70
Sennheiser	HD 25 SP	Dynamic	30 Hz–16 kHz	100	85
Sennheiser	HD 265	Dynamic	10 Hz–25 kHz	94	150
Sennheiser	HD 433	Dynamic	18 Hz–20 kHz	100	32
Sennheiser	RS 6	Dynamic	20 Hz–20 kHz	N/A	N/A
Sennheiser	RS 8	Dynamic	20 Hz–22 kHz	N/A	N/A
Sony	MDR-7506	Dynamic	10 Hz–20 kHz	106	63
Yamaha	RH1	Dynamic	20 Hz–20 kHz	90	32
Yamaha	RH3	Dynamic	20 Hz–20 kHz	95	60
Yorkville Sound	Apex HP 30	Dynamic	20 Hz–20 kHz	100	40
Yorkville Sound	Apex HP 60	Dynamic	20 Hz–20 kHz	100	40

Power-Handling  
CapacityEar-Cup  
DesignEar-Cup  
Covering

## Cord Length

## Price

200 mW	Off-head	Leatherette	6', with 10' extension cable	\$1 456
200 mW	Semiopen; supraural	Leatherette	10'	\$127.20
200 mW	Semiopen; supraural	Leatherette	10'	\$138
200 mW	Semiopen; circumaural	Leatherette	10'	\$192
200 mW	Semiopen; circumaural	Leatherette	10'	\$172.80
200 mW	Sealed; circumaural	Leatherette	10'	\$330
200 mW	Open; circumaural	Leatherette	10'	\$162.20
200 mW	Semiopen; circumaural	Foam	6'	\$62.60
120 mW	Circumaural	Leatherette	9.8'	\$115
1,600 mW	Circumaural	Leatherette	11'	\$150
N/A	Open; supraural	Felt	10'	\$49
100 mW	Closed	Felt	10'	\$179
10 mW	Closed; circumaural	Felt	10'	\$199
100 mW	Closed	Felt	10'	\$159
100 mW	Open	Felt	10'	\$159
200 mW	Semiopen	Leather	8'	\$119
200 mW	Closed	Leather	8'	\$129
100 mW	Semiopen	Foam	6'	\$70
100 mW	Semiopen	Foam	6'	\$85
100 mW	Closed	Leatherette	8'	\$99.99
100 mW	Open	Cloth	8'	\$199.99
100 mW	Open	Leatherette	8'	\$149.99
100 mW	Closed	Leatherette	8'	\$29.99
100 mW	Closed	Leatherette	(2) 8' (incl phase II for 3D sound)	\$89.99
100 mW	Open	Foam	8'	\$44.99
100 mW	Open	Cloth	(2) 8' (incl phase II for 3D sound)	\$69.99
100 mW	Closed	Leatherette	8', w/dual volume control	\$39.99
100 mW	Open	Foam	8'	\$49.99
100 mW	Closed	Leatherette	4.5' (incl phase II for 3D sound)	\$54.99
100 mW	Open	Foam	4.5' (incl phase II for 3D sound)	\$59.99
100 mW	Closed	Leatherette	8'	\$49.99
100 mW	Open	Cloth	8'	\$69.99
100 mW	Closed	Leatherette	8'	\$19.99
100 mW	Closed	Leatherette	8'	\$29.99
100 mW	Closed	Leatherette	10'	\$49.99
100 mW	Semiopen	Leatherette	10'	\$89.99
100 mW	Semiopen	Leatherette	10'	N/A
100 mW	Open	Velour	10'	N/A
100 mW	Open	Velour	10'	\$189.99
100 mW	Closed	Leatherette	10'	\$199.99
100 mW	Circumaural	Velvet	10'	\$299.99
100 mW	Closed	Leatherette	10'	\$89.99
100 mW	Open	Velvet	10'	N/A
1,300 mW	Closed	Vinyl	8'	\$149
100 mW	Open	Vinyl	11.5'	\$99
100 mW	Closed; supraural	Padded vinyl	4.9'	\$259
200 mW	Closed; supraural	Padded vinyl	10'	\$149.95
200 mW	Closed; circumaural	Padded vinyl	10'	\$249.95
100 mW	Open; supraural	Foam	10'	\$29.95
N/A	Supraural	Foam	Wireless	\$269.95
N/A	Supraural	Foam	Wireless	\$369.95
1W	Closed	Vinyl-covered foam	9.75'	\$170
N/A	Open	Foam	6'	\$19.95
N/A	Closed	Vinyl-padded	8'	\$49.95
200 mW	Open back	Leatherette	10'	\$22.95
200 mW	Semiopen back	Leatherette	10'	\$29.95



# 3

## Outboard Processors & MIDI Devices

Outboard audio processors fall roughly into three categories: dynamics processors, effects processors, and equalizers. If a product does not exactly fit into one of these categories, we placed it on the closest-matching chart and supplied more detailed information in the Special Features column. Note that "stompbox" products are generally not listed. This section also includes charts for several types of MIDI and synchronization products.

The Dynamics Processors chart shows traditional parameters such as threshold, ratio, and attack/release times, but it also tells you whether a particular product has a bypass switch, can be stereo linked and/or sidechained, offers useful meters, and more. Some processors provide detailed control; others combine several functions in a single control, which can make the device easier to use but less flexible. As with mic preamps, some processors use tubes and some are solid-state.

The Effects Processors chart lists each unit's analog and digital effects and provides specs on I/O and A/D/A converters. It also tells you the maximum delay time, how many effects can be run simultaneously, whether the unit has a Compare/Bypass function, and other information. Sequencer jockeys and other MIDI fanatics will appreciate the category showing the number of MIDI control messages a processor supports.

The Equalizers chart includes specs on both analog and digital parametric and graphic EQs. Semiparametric equalizers generally offer control over amplitude and center frequency but have a fixed bandwidth (Q). Quasiparametric EQs may provide full frequency and gain controls while offering only two or three Q settings.

We've lumped MIDI interfaces, patch bays, and processors into one chart because some devices combine these functions. A few units provide a wide variety of processing features, including the ability to send a given MIDI data stream only to a specific keyboard zone (that is, a user-defined note range), to filter out unwanted messages, and to remap MIDI messages (convert an incoming MIDI control message to a different message). In addition, some MIDI interfaces can serve as basic SMPTE and MIDI Time Code generator/readers.

We list only a few specifications for synchronizers, but some are important to note. The SMPTE time code type is especially critical. Linear Time Code (LTC) is the most common for audio synchronization; you'll mostly need Vertical Interval Time Code (VITC) if you are locking your system to a video deck. Also, if you need to synchronize digital devices such as a digital mixer, you'll need word-clock sync; if a unit supports word clock (WC), this fact is noted in the Special Features column.

120	Dynamics Processors
128	Effects Processors
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140	Synchronizers

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# DYNAMICS PROCESSORS

Manufacturer	Model	Type	Threshold	Ratio	Attack Times	Release Times	Gain Control
Alesis	3630 Compressor	Compressor/limiter/gate	-40 to +20 dB	1:1 to $\infty$ :1	Auto or man (0.1 to 200 ms)	Auto or man (50 ms–3 sec)	Output
Alesis	NanoCompressor	Compressor/limiter	-40 to +8 dB	1:1 to $\infty$ :1	Auto or man (0.1 to 200 ms)	Auto or man (50 ms–3 sec)	Output
Amek	Dual Compressor/Limiter	Compressor/limiter	30 to +12 dB	1.2:1 to 16:1	0.3–300 m	0.1–10 sec	Output
Anthony DeMaria Labs	1000	Compressor/limiter	Fixed	3:1 to 12:1	Auto (10 $\mu$ s)	Auto (0.07 sec)	Input
Anthony DeMaria Labs	1500	Compressor/limiter	Fixed	3:1 to 12:1	Auto (10 $\mu$ s)	Auto (0.07 sec)	Input
Aphex Systems	105	4-channel logic-assisted noise gate	-50 to +20 dB	$\infty$ :1	Manual (200 $\mu$ s–250 ms)	Manual (150 ms–4 sec)	N/A
Aphex Systems	106 Easyrider	4-channel compressor	Fixed	1:1 to 5:1 (prog. dep.)	Auto	Auto w/2 selectable ranges	Input, output
Aphex Systems	108 Easyrider	2-channel compressor	Fixed	1:1 to 5:1 (prog. dep.)	Auto	Auto w/2 selectable ranges	Input, output
Aphex Systems	320A Compressor	Compressor/leveler/limiter	Fixed	Leveler: 20:1, compressor: 1:1 to 3:1, limiter: $\infty$ :1	Auto (1 $\mu$ s–2.5 sec)	Auto w/2 ranges of leveling release times	Output
Aphex Systems	622 Logic Assisted Expander/Gate	Expander/gate	-50 to +20 dB	Gate: $\infty$ :1, expander: 1.2:1 to 10:1	Manual (10 $\mu$ s–100 $\mu$ s)	Manual (40 ms–5 sec)	N/A
Aphex Systems	651 Expressor	Compressor	-20 to +20 dB	1:1 to 50:1	Manual (0.05–100 ms)	Manual (40 ms–4 sec)	Input, output
Aphex Systems	661 Expressor	Tube compressor	-30 to +20 dB	1:1 to 30:1 (manual), no-knee (auto)	Auto or manual (0.05–100 ms)	Auto or manual (40 ms–4 sec)	Input, output
Aphex Systems	720 Dominator II	Peak limiter	-9 to +25 dB	$\infty$ :1	Auto	Auto or manual (150 ms–7 sec)	Input
API	API 525	Single channel compressor	Variable, $\infty$ to 0 VU	2:1 or 20:1	15 m	0.1–2.5 sec	Input, output
A.R.T.	Dual Levelar	Optical-electrical tube compressor	-40 to +10 dB	Compressor: 2.3:1, limiter: 6:1	Auto, fast	Auto, fast	Output
A.R.T.	Pro VLA	Optical-electrical tube compressor	-20 to +15 dB	2:1 to $\infty$ :1	Fast, slow	Fast, slow	Output
A.R.T.	Tube Compressor	Optical-electrical tube compressor	-40 to +10 dB	Compressor: 2.3:1, limiter: 6:1	Auto, fast	Auto, fast	Output
A.R.T.	Tube PAC	Transformerless tube preamp/compressor	-20 to +20 dB	Compressor: 2.3:1, limiter: 6:1	Auto, fast	Auto, fast	Input, output
ARX	Afterburner	Compressor/limiter	-40 to +20 dB	1:1 to $\infty$ :1	Auto	Auto	Output
ARX	DDP-1	Compressor/limiter/gate	-40 to +20 dB	1:1 to $\infty$ :1	Auto	Auto	Output
ARX	Quadcomp 2	Compressor/limiter	-40 to +20 dB	1:1 to $\infty$ :1	Auto	Auto	Output
ARX	Sixgate	Gate	-50 to +10 dB	$\infty$ :1	Auto	20 ms–2 sec	N/A
Ashly Audio	CLX 51	Compressor/limiter	-40 to +22 dBu	2:1 to $\infty$ :1	Manual (200 $\mu$ s–20 ms)	Manual (100 ms–3 sec)	Input, output
Ashly Audio	CLX 52	Dual-channel compressor/limiter	-40 to +22 dBu	2:1 to $\infty$ :1	Manual (200 $\mu$ s–20 ms)	Manual (100 ms–3 sec)	Input, output
Avalon Design	AD2044	100% discrete, pure Class A opto-compressor, 2U rack-mount	-24 to +20 dB	1:1 to 20:1	(0.5–150 ms) Manual	8 ms–5 sec for 1 dB release	Output
Avalon Design	VT-747SP	100% discrete, pure class A opto-compressor/EQ	-30 to +20 dB	1:1 to 20:1	2–200 ms	10 ms–5 sec for 12 dB release	Output
BBE	BBE 262 Sonic Maximizer	Audio enhancer	N/A	N/A	N/A	N/A	N/A
BBE	BBE 362 Sonic Maximizer	Audio enhancer	N/A	N/A	N/A	N/A	N/A
BBE	BBE 362NR Sonic Maximizer	Audio enhancer	N/A	N/A	N/A	N/A	N/A
BBE	BBE 362SW Sonic Maximizer	Audio enhancer	N/A	N/A	N/A	N/A	N/A
BBE	BBE 462 Sonic Maximizer	Audio enhancer	N/A	N/A	N/A	N/A	N/A

Bypass Switch	# of Channels/ Stereo Link	Meter Type	Main I/O	Sidechain I/O	Dimensions	Special Features	Price
Yes	2/Yes	12-segment LED	1/4"	1/4" TRS	19x1.75x4.5	Hard/soft knee; peak/RMS compression; gate w/threshold	\$299
Yes	Dedicated stereo	6-segment LED	1/4"	1/4" TRS	5.5x1.75x4.5	Hard/soft knee; peak/RMS compression	\$119
Yes	2/Yes	VU	XLR	Yes	19x12x3.5	Ambience; hard knee	\$2,946
No	Mono	VU	XLR	N/A	19x3.5x8	All tube	\$1,695
No	2/Yes	VU	XLR	N/A	19x3.5x9	All tube	\$2,995
No	4/No	LED	1/4" TRS	External key input	19x1.75x5.2	Logic assist; uses VCA 1001	\$449
Yes	4/Yes x2	LED	1/4" TRS	N/A	19x1.75x5.2	Wave-dep comp; sounds like slow attack w/benefits of fast	\$449
Yes	2/Yes	LED	1/4" TRS	N/A	19x1.75x5.2	Wave-dep comp; sounds like slow attack w/benefits of fast	\$299
Yes	2/Yes	LED	XLR	N/A	19x1.75x10	Dynamic verifiable gate; frequency-dependent leveler; dynamic release computer	\$1,350
Yes	2/Yes	LED	XLR	1/4"	19x1.75x9	Logic assist	\$795
Yes	Mono	LED	XLR	1/4"	19x1.75x9.5	Hi-frequency expander	\$495
Yes	Mono	LED	XLR; 1/4"	1/4"	19x1.75x10.13	Tubessence; Easyrider auto mode; hi-freqncy exp	\$749
Yes	2/Yes	LED	XLR	N/A	19x1.75x10	Brickwall limiter; 3-band auto limit threshold	\$1,350
Yes	Mono	VU miniature GR meter	XLR (when in API frame)	N/A	Module	Reissue of early '70s API compression; fits API frames/consoles; ceiling control adj threshold/out gain simultaneous; de-esser	\$549
Yes	2/Yes	LED	XLR; 1/4"	N/A	19x1.75x6.5	Vactrol electro-optical tube compressor	\$349
Yes	2/Yes	LED, VU	XLR; 1/4" TRS	N/A	19x3.5x6.5	Vactrol electro-optical tube compressor	\$649
Yes	Mono	LED	XLR; 1/4"	N/A	5.375x2.0x5.25	Vactrol electro-optical tube compressor	\$139
Yes	Mono	LED	XLR; 1/4"	N/A	8.5x1.65x5.25	Vactrol electro-optical tube compressor; phantom power; +20 dB gain; phase control	\$279
Yes	2/Yes	9-segment LED GR; 9-segment output level	XLR; 1/4" TRS	1/4" TRS	19x1.75x6.5	Enhance; switch to dual band (lo/hi) mono	\$490
Yes	2/Yes	9-segment LED GR; 9-segment output level	XLR; 1/4" TRS	1/4" TRS	19x1.75x6.5	Massive headroom	\$555
Yes	4/Yes x2	7-segment LED GR	XLR	1/4" TRS	19x1.75x6.5		\$550
Yes	6	Gate open/closed LEDs	1/4" TRS	1/4" TRS	19x1.75x6.5	Six gates in 1 rackspace	\$460
Yes	Mono	11-segment LED	XLR; 1/4"	1/4"	19x1.75x6	Infinite soft knee and timing based on comp ratio; intrnl pwr supp	\$349
Yes	2/Yes	11-segment LED	XLR; 1/4"	1/4"	19x1.75x6	Infinite soft knee and timing based on compressor ratio; internal power supply	\$499
Yes	2/Yes	VU-output and GR, GR LED	XLR (+30 dB)	XLR	19x12x3.5	Opto compressor w/time control; external B2T power supply (100-240V)	\$3,000
Yes	Dedicated stereo	VU for GR; (2) 20-segment output LED (-27 to +30 dB)	(2) XLR (+30 dB)	2 bands w/variable threshold -15 to +15 dB, frequency 70 Hz-9 kHz twin rings	19x12x3.5	6-band graphic EQ (10 Hz-32 kHz); pre/post compressor sidechannel; tube bypass	\$2,495
Yes	2/No	N/A	1/4"; RCA	N/A	6.25x5.25x1.25	BBE process	\$229
Yes	2/Yes	1 LED clip per channel	1/4"	N/A	1 rackspace	BBE process	\$259
Yes	2/Yes	1 LED clip per channel	1/4"; RCA	N/A	1 rackspace	BBE process; noise reduction	\$359
Yes	2/Yes	5-segment LED/channel	1/4"; RCA	N/A	1 rackspace	BBE process; subwoofer filter	\$349
Yes	2/No	5-segment LED/channel	1/4" TRS, XLR	N/A	1 rackspace	BBE process	\$349



# DYNAMICS PROCESSORS

Manufacturer	Model	Type	Threshold	Ratio	Attack Times	Release Times	Gain Control
BBE	BBE 862 Sonic Maximizer	Audio enhancer	N/A	N/A	N/A	N/A	N/A
Behringer	MDX 1400 Autocom Pro	Compressor	-40 to +20 dB	1:1 to limit	0.1–200 ms	0.05–4 sec	Output
Behringer	MDX 2200 Composer Pro	Compressor/limiter/expander	Compressor: -40 to +20 dB; expander: -70 to +20 dB	Compressor: 1.2:1 (program dependent)	Compressor: manual, expander: preset	Manual	Output
Behringer	MDX 2400 Multicom	Compressor	-40 to +20 dB	1:1 to ∞:1	Auto	Auto	Output
Behringer	SNR 1000 Studio Denoiser	Noise reduction	-50 to +10 dBu	1:1 to 6:1	Auto	Manual (50 ms to 4 sec)	N/A
Behringer	SNR 2000 Multiband Denoiser	Noise reduction	-40 to +20 dBu	1:1 to 1:6	Auto	0.05–6 sec	Output
Behringer	XR 4400 Multigate Pro Pro	Gate	-40 to +10 dB	1:1 to 4:1	Auto	Manual (50 ms–4 sec)	Output
Bellari	LA120	Tube compressor/limiter	-40 to 0 dB	2:1 to ∞:1	Program dependent	Program dependent	Output
Bellari	LA120	Tube compressor/limiter	-20 to +20 dB	Switchable 2:1, 10:1	Program dependent	Program dependent	Output
Bellari	RP583	Tube compressor/limiter	-20 to +20 dB	2:1 to ∞:1	Manual (0.5–100 ms)	Manual (1–2 sec)	Output
beyerdynamic	Dynamax	Compressor/de-esser/limiter/noise gate	Automatic	Automatic	Automatic	Auto	Output
BSS Audio	DPR40	Compressor/de-esser/limiter	-30 to +20 dBu	1:1 to ∞:1	Manual (50 µs–80 ms)	Auto or manual (5 ms–5 sec)	Output
BSS Audio	DPR40	Quad compressor	-30 to -20 dBu	1:1 to ∞:1	Auto	Auto	N/A
BSS Audio	DPR422	Dual compressor/de-esser	-30 to +20 dB	1:1 to ∞:1	Auto or manual (50 µs–400 ms)	Auto or manual (5 ms–5 sec)	Output
BSS Audio	DPR504	Quad gate	-50 to +20 dBu	N/A	Auto (20 µs or 40 µs–5 ms) program dependent	Manual (1 ms–3 sec)	N/A
BSS Audio	DPR522	Dual gate	-60 to +15 dB	N/A	Manual (20 µs–1.5 sec)	Manual (1 ms–3 sec)	N/A
BSS Audio	DPR901II	Dynamic equalizer	-30 to +20 dBu	N/A	Auto	Auto	N/A
BSS Audio	DPR944	Gate/compressor	Gate: -50 to +20 dB; compressor: -30 to +20 dB	1:1 to ∞:1 compressor only	Auto	Auto	Output
Crane Song	STC-8 Class A Compressor Limiter	Compressor/limiter	Automatic	1:1 to 1:20	0.1–150 ms	Auto (40 ms–10 sec)	Output
Crane Song	Trakker	Discrete Class A, single-channel compressor/limiter	-40 to +24 dB	1:1 to 20:1	Manual 0.05–200 ms	Auto 40 ms–10 sec	Output
dbx	1046	Quad compressor/limiter	-40 to +20 dBu	1:1 to ∞:1	Auto	Auto	Output
dbx	1066	Compressor/limiter/expander/gate	Expander/gate: 0 to +15 dBu; compressor: -40 to +20 dBu; limiter: 0 to +24 dBu	Expander/gate: 1:1 to 30:1; compressor: 1:1 to ∞:1	Auto or manual (0.05–100 ms)	Auto or manual (0.05 ms–5 sec)	Output
dbx	160A	Compressor	-40 to +20 dBu	1:1 to -1:1	Auto	Auto	Output
dbx	160SL	Compressor/limiter	-40 to +10 dBu	1:1 to ∞:1	Auto or manual	Auto or manual	Output
dbx	165A	Compressor	-40 to +10 dB	1:1 to ∞:1	Auto or manual	Auto or manual	Output
dbx	166XL	Compressor/limiter	Expander: ∞ to +15 dBu; compressor: -40 to +20 dBu; limiter: 0 to +20 dBu	1:1 to ∞:1	Auto	Auto	Output
dbx	262	Compressor/limiter	-40 to +20 dBu	1:1 to -1:1	Auto	Auto	Output
dbx	266XL	Compressor/expander/gate	-40 to +20 dB; expander: -60 to +10 dB	1:1 to ∞:1	Auto or manual	Auto or manual	Output
Demeter	H CL-1 Mono Tube Optical Compressor	Compressor/limiter	-30 to +20	Optical/soft knee 2:1 to 30:1	1–200 ms	100 ms to 5 sec	Input, output
Demeter	VTCL-2a Stereo Tube Optical Compressor Limiter	Compressor/limiter	-30 to +20	Optical/soft knee 2:1 to 30:1	1–200 ms	100 ms–5 sec	Input, output

Bypass Switch	# of Channels/ Stereo Link	Meter Type	Main I/O	Sidechain I/O	Dimensions	Special Features	Price
Yes	2/No	5-segment LED/channel	1/4" TRS, XLR	N/A	1 rackspace	+23 dBu headroom	\$599
Yes	2/Yes	8-segment GR LED	1/4" TRS in/ 1/4" outs	1/4" TRS	1.75x19x8.5	Auto compressor, real time program-dependent attack/release times; expander/gate; enhancer	\$219.99
Yes	2/Yes	LED	1/4"	1/4"	19x1.75x8.5		\$309.99
Yes	4/No	8-segment LED	XLR, 1/4"	N/A	19x1.75x8.5		\$369.99
Yes	2/Yes	LED	1/4"	N/A	19x1.75x8.5		\$249.99
Yes	2/Yes	8-segment GR LED	1/4" TRS ins/ XLR, 1/4" TRS outs	N/A	1.75x19x8.5	Auto filter; IRC expander/gate	\$249.99
Yes	4/No	LED	1/4" TRS	1/4" TRS	19x1.75x8.5		\$309.99
Yes	Mono	VU	XLR, 1/4"	N/A	7.6x1.6x5.4		\$159.99
Yes	Mono	VU	XLR, 1/4"	N/A	7.6x1.6x5.4		\$159.99
Yes	2/Yes	VU	XLR, 1/4"	1/4"	19x3.5x6		\$650
Yes	Yes	20-digit LED	XLR, 1/4" TRS	1/4"	N/A	Uses THAT 2181 VCA	\$869
Yes	2/Yes	5/9/12-segment LED	XLR	Barrier strip	19x1.75x9	Subtractive GR system; knee variable w/compressor ratio; broad-band/HF de-essing; monitor sidechain	\$1,599
Yes	4/Yes	15/8-segment LED	XLR	1/4"	19x1.75x11	HF de-essing (variable); 2-spd attack/release; progressive knee	\$1,449
Yes	2/Yes	5/6-segment LED	XLR	1/4"	19x1.75x8	Progressive knee; de-esser (broad-band/HF)	\$899
Yes	4/Yes	12-segment LED	XLR	1/4" TRS	19x1.75x11	Key-listen; external key-source facility; sidechain filter	\$1,449
Yes	2/Yes	3/9-segment LED	XLR	1/4"	19x1.75x8	Key-listen; check key; auto dynamic enhancement; key filter	\$799
Yes	1 or 2/Yes	10-segment LED	XLR	N/A	19x1.75x9	Above or below threshold control; shelving EQ; 1 and 2-channel split; sidechain key-listen; filter width control; fast/slow release	\$1,549
Yes	4/Yes	12-segment LED	XLR	1/4" TRS (gate only)	19x1.75x7.1		\$899
Yes	2/Yes	16-segment LED	XLR	DB15	19x3.5x12	Soft knee; dual sidechain; program dependent release	\$3,400
Yes	1/Yes	23-segment LED	XLR	DB-9	1 rackspace	Choice of optical, air optical, soft knee and hard knee; choice of clean, vintage, clean VCA, or vintage VCA	\$1,695
Yes	4/Yes	LED	XLR, 1/4" TRS	N/A	1 rackspace	Hard knee/OverEasy switch	\$649.95
Yes	2/Yes	LED	XLR, 1/4" TRS	1/4" TRS	1 rackspace	Sidechain monitor; OverEasy; auto switch	\$549.95
Yes	Mono	LED	XLR, 1/4"	1/4" TRS	1 rackspace	Switchable hard/soft/OverEasy; contour button; mode switch on limiter; slow/fast attack	\$459.95
Yes	2/Yes	VU	XLR, 1/4" TRS	XLR, 1/4" TRS	2 rackspace	Peak Stop/Peak Stop Plus; V8 VCA, optional 24-bit digital out (AES/EBU, S/PDIF simultaneous)	\$2,799.95
Yes	Mono	VU	Barrier strip	N/A	2 rackspace	Peak Stop limiter (threshold -2 to +24 dB)	\$1,799.95
Yes	2/Yes	19-segment LED	XLR, 1/4" TRS	1/4" TRS	1 rackspace	Switchable hard knee/OverEasy	\$329.95
Yes	2/Yes	LED	1/4" TRS	N/A	1 rackspace	Hard knee; soft knee; OverEasy	\$159.95
Yes	2/Yes	LED	XLR, 1/4" TRS	1/4" TRS	1 rackspace	Hard knee; soft knee; OverEasy	\$249.95
No	1/Yes	10-segment LED VU/ overload LED	XLR, TRS 1/4"	XLR, 1/4" TRS	19x1.75x13	H series tube hybrid; various attack/release; adjustable input sensitivity	\$1,149
No	2/Yes	Analog VU/overload 3-segment LED	XLR, TT, 1/4" (2)	N/A	2 rackspace 19x3.5x12	All tube; various attack/release; adjustable input sensitivity	\$2,499



# DYNAMICS PROCESSORS

Manufacturer	Model	Type	Threshold	Ratio	Attack Times	Release Times	Gain Control
Demeter	VTCL-2ax Stereo Tube Optical Compressor Limiter	Compressor/limiter	-30 to +20	Optical/soft knee 2:1 to 30:1	1-200 ms	100 ms-5 sec	Input; output
DOD	SR866	Gated compressor/limiter	-40 to +20 dBu	1:1 to ∞:1	Manual (0.1-100 ms)	Manual (50 ms to 2.5 sec)	Input; output
Drawmer	1960	Dual-channel tube compressor/tube preamp	∞ to -24 dB	1:1.1 to 30:1	Manual or auto (0.5 ms-20 ms)	Manual or auto (200 ms-20 sec)	Input; output
Drawmer	DL241/DL241XLR	Dual compressor/limiter	Compressor: -40 to +20 dB; expander/gate: -70 to +20 dB; limiter: 0 to +18 dB	1.2:1 to ∞:1	Auto or manual (0.5-100 ms)	Auto or manual (0.05-4 sec)	Input; output
Drawmer	DL251	Dual-channel "spectral" compressor	Compressor: -40 to +20 dB; limiter: 0 to +18 dB	1.2:1 to ∞:1	Auto or manual (0.5-100 ms)	Auto or manual (0.05-5 sec)	Input; output
Drawmer	DL441	Quad compressor/limiter	Compressor: -40 to +20 dB; limiter: 0 to +18 dB	1.2:1 to ∞:1	Auto (0.5-100 ms)	Auto (0.05-4 sec)	Input; output
Drawmer	DS201B	Dual noise gate	-54 to ∞ dB	N/A	Manual (10 μs-1 sec)	Manual (2 ms-4 sec)	N/A
Drawmer	DS404	Quad noise gate	-70 to +20 dB	N/A	Auto	Combines hold and decay (10 ms-5 sec)	N/A
Drawmer	MX30	Dual gate/auto compressor/limiter	Compressor: -40 to +20 dB; expander/gate: -70 to +20 dB; limiter: 0 to +18 dB	1.2:1 to ∞:1	Auto or manual (0.5-100 ms)	Auto or manual (0.05-4 sec)	Output
Drawmer	MX40	Quad noise gate	-54 to ∞ dB	N/A	10 μs	2 ms-4 sec	N/A
Drawmer	MX50	Dual channel de-esser	Self-setting	Auto	Auto	Auto	De-ess frequency
Empirical Labs	EL-8 Distressor	Compressor/limiter	Varies with input level	1:1 to ∞:1	Manual (<40 μs-50 ms)	Manual (0.05-3.5 sec)	Input; output
Focusrite	Blue 330 Stereo Mastering Compressor/Limiter	Compressor/limiter	Compressor: -6 to 16 dB; limiter: 0 to 22 dB	1.2:1 to 20:1	300 μs-100 ms	100 ms-4 sec or auto	Output
Focusrite	Focusrite Compounder	Compressor/expander/ noise gate/limiter	-30 to +10	Variable soft/hard knee	Variable	Variable	Output
Focusrite	Focusrite VoiceMaster	Compressor/de-esser/ expander/EQ/mic-pre	-30 to +10	Variable soft/hard knee	Auto	Variable	Output
Focusrite	Red 3 Dual Compressor/Limiter	Compressor/limiter	Compressor: -24-12 dB; limiter: 0-18 dB	Switchable 1:1.5, 2, 3, 5, 7, 10	300 μs-90 ms	Variable (100 ms-4 sec)	Output
Furman	C-132 Compressor/Limiter	Compressor	-22 to +22 dB	2:1 to 50:1	50 μs-50 ms	50 ms-1.1 sec	Output
Furman	LC-6 Stereo Compressor/Gate	Compressor/ noise gate	Compressor: -20 to +20 dB; gate: ∞ to +20 dB	1.4:1 to >50:1	Compressor (100 μs-1 sec); gate: preset (1 ms)	Compressor (0.05-5 sec); gate: preset (250 ms)	Input; output
Furman	QN-44 Quad Noise Gate	Noise gate	∞ to +20 dB	50:1	Manual (50 μs-50 ms)	Manual (50 ms-5 sec)	N/A
HHB	HHB Radius 30	Compressor/expander/ limiter	-20 to +20 dB	11.5 to 1:30	Auto (0.5 ms-20 ms)	40 ms-2 sec	Output
Independent Audio	Calrec RO 3200	Preamplifier/EQ/ compressor/expander/gate	N/A	2:1	Normal: 4 ms; fast: 0.2 ms	75 ms-4 sec	Input; output
Independent Audio	Calrec ROD 6400	Twin compressor/limiter	N/A	100:1	Normal: 4 ms; fast: 0.2 ms	0.1-4 sec variable; w/auto facility 0.1-1.5 sec	24 dB
JBL	M644	4-channel noise gate	-60 to +20 dBu	N/A	Manual (50 μs-25 ms)	Manual (50 ms-5 sec)	Output
JBL	M712 Two Channel Gating Compressor/Limiter	Compressor/limiter	-60 to +20 dBu	1:1 to 165:1	Compressor: manual (1-100 ms); gate: auto (470 μs)	Compressor: manual (100 ms-1.5 sec); gate: auto (95 ms)	Output
Klark-Teknik	DN500	Dual compressor/ limiter/expander	Compressor: -30 to +20 dB; expander: -40 to +20 dB; limiter: 0 to +20 dB	Compressor: 1:1 to 50:1; expander: 1:1 to 25:1	Compressor: auto or manual (50 μs-20 ms); expander: auto or manual (2 ms)	Compressor: auto/manual (60 μs-2 sec); expander: auto/manual (40 ms-2 sec)	Output
Klark-Teknik	DN504	Quad compressor/limiter	-30 to +20 dB	1:1 to 50:1	Auto or man (50 μs-20 ms)	Auto or manual (60 ms-2 sec)	Output
Klark-Teknik	DN514	Quad auto gate	-40 to +20 dB	N/A	Program dep, semiautomatic (50-200 μs or 500 μs-2 ms)	Manual (40 ms-2 sec) including hold	N/A

Bypass Switch	# of Channels/ Stereo Link	Meter Type	Main I/O	Sidechain I/O	Dimensions	Special Features	Price
No	2/Yes	Analog VU/vrld 3-segment LED	Balanced XLR, TT and 1/4" (2)	N/A	2 rackspace 19x3.5x12	Jensen transformers; all tube; various attack/release; adjustable input sensitivity	\$2,499
Yes	2/Yes	LED	1/4" TRS; RCA	1/4"	19x1.75x9	Soft knee	\$239.95
Yes	2/Yes	VU meter each channel	XLR	1/4"	19x3.5x7	2-channel classic tube compressor w/tube-based VCA	\$2,349
Yes	2/Yes	8-segment LED on compressor out, 8-segment GR LED	1/4" (DL241); XLR (DL241XLR)	N/A	19x1.75x7	Program Adaptive expander/gate, zero response time peak limiter, auto/manual attack/release	(DL241) \$699 (DL241XLR) \$735
Yes	2/Yes	8-segment LED out, 9-segment GR LED	XLR	1/4" TRS	19x1.75x7	Hi-frequency dynamic expander and compressor, zero response time peak limiter, hard/soft-knee	\$1,050
Yes	4/Yes	5-segment output LED, 8-segment GR LED	XLR	N/A	19x1.75x7	Zero response time peak limiter: hard/soft knee	\$1,099
Yes	2/Yes	3-segment "traffic light" LEDs	XLR	1/4" key input	19x1.75x7	Frequency-sensitive gating w/HP & LP filters; hold and decay controls; key-listen, docker	\$735
Yes	4/Yes	3-segment "traffic light" LED per channel	XLR	1/4" key input	19x1.75x7	Frequency-sensitivity gating w/HP and LP filters; hard/soft gate (downward expander), -20/-90 ring switch	\$1,099
Yes	2/Yes	8-segment LED comp out, 9-segment GR LED, 2-seg LED gate on/off	XLR, 1/4"	N/A	19x1.75x7	Program adaptive expander/gate; zero response time peak limiter	\$479
Yes	4/Yes	3-segment "traffic light" LEDs	XLR	1/4" key input	19x1.75x7	Frequency sensitivity gating w/1 octave filter (50 Hz-8 kHz); key listen, trigger stabilization, peak punch	\$629
Yes	Yes	LED GR meter each channel	XLR	N/A	19x1.75x8	Variable frequency (800 Hz-8 kHz), up to -20 dB split/full band de-essing; "air" switch	\$549
Yes	Mono or 2/Yes	LED	XLR, 1/4"	1/4"	19x1.75x10.1	Emulation of classic compressors (e.g. LA2, LN1176, Fairchild)	(mono) \$1,499 (stereo) \$2,899
Yes	2/Yes	Peak program	XLR	N/A	19x5.25x12.6	Look-ahead limiter	\$7,750
Yes	2/linkable	LED	XLR, 1/4"	1/4"	19" rack unit		\$899
Yes	Mono	LED	XLR, 1/4"	N/A	19" rack unit	Expander/saturation, voice-optimized EQ	\$749
Yes	2/Yes	VU	XLR	N/A	19x3.5x11.25	Stereo switch; auto-release mode	\$3,995
No	Mono	10-segment LED	1/4" (XLR optional)	1/4"	19x1.75x8	Adaptive knee (soft-harder as ratio is increased)	\$269 (w/XLRs) \$303
No	2/Yes	5-segment LED	1/4" (XLR optional)	1/4"	19x1.75x8	Adaptive knee (soft-harder as ratio is increased)	\$439 (w/XLRs) \$507
No	4/No	LED	1/4" (XLR optional)	1/4"	19x1.75x8	Depth controls adjust amount of muting	\$429 (w/XLRs) \$565
Yes	2/Yes	VU; LED	1/4" TRS	1/4"	19x7.9x3.5	VU Switchable between output and GR	\$749
Yes	1/Yes	20-segment LED	XLR	XLR	19x1.75x12		\$2,899
Yes	2/Yes	20-segment LED	XLR	XLR	19x1.75x13.5	Stereo	\$3,765
No	4/No	LED	1/4" TRS	1/4"	19x1.75x5.625	30 Hz HP filter, external ground-link terminals	\$515
Yes	2/Yes	8-segment LED	XLR, 1/4"	1/4"	19x1.75x5.625	Soft-knee compressor; 30 Hz HP filter; external ground-link terminals	\$515
Yes	2/Yes	LED	XLR	1/4" TRS	19x1.75x11.5	Variable knee: VCA design, variable-ratio expander	\$1,425
Yes	4/Yes	LED	XLR	1/4" TRS	19x1.75x11.5	Hard or soft knee (switchable)	\$1,495
Yes	4/No	LED	XLR	1/4"	19x1.75x11.5	Synchronizes harmony parts, brass sections, etc. by interlocking all 4 gate release times	\$1,215



# DYNAMICS PROCESSORS

Manufacturer	Model	Type	Threshold	Ratio	Attack Times	Release Times	Gain Control
LA Audio	BCL2	Dual compressor/limiter	-40 to +20 dB	1:1 to 20:1	Peak: variable (1–70 ms); RMS: program dependent (typ 12 ms, 12 dB/4 ms 24 dB)	Peak: variable 100 ms–3 sec; RMS: prog dep (typ 120 ms @ 12 dB/240 ms @ 24 dB)	-20 to +20 dB
LA Audio	FGC2	Dual split band compressor- frequency selective gate	-40 to +20 dB	1:1 to 20:1	Fast 1 ms; slow 20 ms	40 ms–4 sec	-6 to +20 dB
LA Audio	GCX2	Dual compressor/gate	-50 to +20 dB	1:1 to 20:1	Program dependent: 5–70 ms (fast); up to 3 sec (slow)	Program dependent: up to 1 sec (fast); up to 3 sec (slow)	-16 to +20 dB
LA Audio	TCX2	Dual compressor/gGate	-30 to +20 dB	1:1 to 20:1	Auto or manual (0.1–100 ms)	Auto or manual (0.04–4 sec)	Gain makeup: +20 dB
Langevin	Langevin Electro-Optical	Leveling amp	-8 to +17 dB	10:1	Preset (1.5 ms)	Preset (250 ms)	Output
Manley Labs	Stereo Electro-Optical	Stereo electrical-optical	-8 to +17 dB	10:1	Preset (1.5 ms)	Preset (250 ms)	Output
Manley Labs	Stereo Variable MU	Tube compressor/limiter	-32 to +14 dB	2:1 to 20:1	Manual (25–70 ms)	Man (0.2, 0.4, 0.6, 4, 8 sec)	Input, output
Millennia Media	Twincom TCL-2	Compressor/limiter	All	2:1 to 30:1	2 ms	0.1–30 sec	Output
Oram Pro	Sonicomp 1	Solid-state compressor	Yes	Yes	Yes	Yes	Input, output
Oram Pro	Sonicomp 2	Solid-state compressor	Yes	Yes	Yes	Yes	Input, output
Pendulum	6386 Variable-Mu Tube Limiter	6386 variable-mu tube compressor/limiter	Off to -20 dB	Program-dependent	0.5–50 ms	50 ms–20 sec (program dependent)	Input, output
Pendulum	OCL-2	Electro-optical compressor/limiter	off to -20 dB	1.5:1 to 15:1	1.0–50 ms	50 ms–20 sec (program dependent)	Output
Phonic Hi-Tech	PCL3200	Compressor/limiter/gate	-40 to +20 dB	1:1 to ∞:1	Manual (0.1–200 ms)	Manual (50 ms–3 sec)	Output
Joemeek	C2	Stereo "photo-optical" Compressor	-40 to +20 dB	1:1 to 10:1	1–11 ms	250 ms–5 sec	Output
Joemeek	SC-2	Compressor	Varies	4.5:1 to 7:1	Manual (1.5–10 ms)	Manual	Input, output
Joemeek	SC-4	Stereo photo-optical compressor	-40 to +20 dB	2:1 to 10:1	0.5–11 ms	250 ms–5 sec	Output
PreSonus	ACP-22	Stereo compressor/limiter/ spectral gate	-70 to +20 dB	1:1 to 20:1	Auto or manual (comp. 0.1– 100 ms; gate 10 μs–100 ms)	Auto or manual (0.02 ms–2 sec)	Output
PreSonus	ACP-88	8-channel compressor/ limiter/gate	-0 to +20 dBu	1:1 to 20:1	Auto or manual (0.01–100 ms)	Auto or manual (0.02 ms–2 sec)	Output
PreSonus	Blue Max	Smart compressor/ limiter	Fixed (-10 dB) manual mode	1:1 to 20:1	Manual (0.01–100 ms)	Manual (10–500 ms)	Input, output
Rane	DC24	Compressor/limiter/expander/ gate/2-way crossover	-50 to +20 dB	1:1 to 20:1	Auto	Auto	Output
Rolls	RP252	Compressor/limiter/gate	-40 to +12 dB	1:1 to ∞:1	Manual (0.2–10 ms)	Manual (40 ms–2 sec)	Output
Summit Audio	DCL-200 Dual Compressor/Limiter	Tube compressor/limiter	-27 to +25 dBu	1:1 to 7:1	Manual (0.1–100 ms)	Manual (35 ms–10 sec)	Output
Summit Audio	TLA-100A Tube Levelling Amplifier	Tube compressor	-25 to +25 dBu	1:1 to 4:1	Selections (fast, medium, slow)	Selections (fast, medium, slow)	Output
Symetrix	562E Windowing Expander/Gate	Gate/expander	-40 to +20 dB	Gate ∞:1 expander 1:1 to 3:1	Adjustable (auto–300 ms)	Manual (30 ms–2 sec)	N/A
Symetrix	565E Dual Compressor/ Limiter/Expander	Compressor/limiter/ expander	Compressor: -40 to +20 dBu; expander +10 to -40 dBu; limiter -10 to +20 dBu	Compressor: 1:1 to 10:1; expander 1:1.5; limiter 20:1	Compressor: preset limiter: preset (100 μs); expander: preset (4 ms)	Compressor: prog dependent 180 ms–2.55 sec; limiter: 100 ms; expander: 250 ms–5 sec	Output
TUBE-TECH	CL-1B	Opto-cell compressor	+20 to -40 dBm	2:1 to 10:1	Fast, slow	Fast, slow	Off to +30 dB
t.c. electronic	DB Max II	Compressor: 5-band digital mastering processor	-25 to 0 dBu	1:12:1 to ∞:1	Manual (0.3–100 ms per band)	Manual (20 ms–7 sec per band)	Input, output
t.c. electronic	Finalizer 96K	Compressor: multiband digital mastering processor	-25 to 0 dBu	1:12:1 to ∞:1	Manual (0.3–100 ms per band)	Manual (20 ms–7 sec per band)	Input, output
t.c. electronic	Finalizer Express	Compressor: multiband digital mastering processor	1:12:1 to ∞:1	N/A	0.3–100 ms per band	20 ms–7 sec per band	Input, output
TUBE-TECH	LCA-2B	Stereo compressor/limiter	Off to -10 dBu	1.6:1 to 20:1	0.3–70 ms	0.07–2 sec	-6 to +10 dB
TUBE-TECH	MEC-1A	Mic-preamp/EQ/compressor	-20 dB to off	1.5:1 to 10:1	1–100 ms	60 ms–2 sec	10–50 dB
TL Audio	C5021	Tube compressor	-20 to +20 dBu	1.5:1 to 3:1	Auto	Auto	Input
Voce	EVC-1	Tube compressor	∞ to +20 dBu	1:1 to 10:1	Manual (1–1000 ms)	Manual (1–1000 ms)	Output

Bypass Switch	# of Channels/ Stereo Link	Meter Type	Main I/O	Sidechain I/O	Dimensions	Special Features	Price
Yes	2/Yes	12-segment LED	XLR	N/A	19x7.5x1.75	RMS/peak detection mix features; broadcast specials; transformer balance outs; distance x-cell	\$1,199.95
Yes	2/Yes	2x8-segment	XLR	N/A	19x7.5x1.75	Frequency windowing filters in gate, sidechain or audio path	\$999.95
Yes	2/Yes	2x6-segment	XLR; TRS (+4/-10)	N/A	19x6x1.75		\$299.95
Yes	2/Yes	2x6-segment	XLR; TRS (+4/-10)	N/A	19x6x1.75		\$499.95
Yes	Mono	VU	XLR; 1/4"	N/A	19x1.72	All discrete	\$1,775
Yes	2/Yes	VU	XLR; 1/4"	N/A	19x3.5	LA-2A style	\$2,500
Yes	2/Yes	V	XLR	N/A	19x3.5	All tube, fully differential	\$4,000
Yes	2/Yes	SIFAM true audio level meter	XLR	N/A	12x19x3.5	Solid state twin topology tube	\$2,795
Yes	2/Yes	LED: GR/input	1/4", XLR	1/4"	1 rackspace	Solid-state or light-dependent resistor; aluminum knobs	\$1,995
Yes	2/Yes	VU: GR/input	1/4", XLR	1/4"	2 rackspaces	Solid-state or light-dependent resistor; aluminum knobs	\$2,590
Yes	2/Yes	VU	XLR; 1/4"	1/4" TRS	19x12.5x3.5 (2 rackspaces)	Vari-mu feedback comp; small tube as Fairchild 660/670 lms; Class A transformerless out; 3 modes, hard bypass; soft-start	\$4,500
Yes	2/Yes	VU	XLR; 1/4"	1/4" TRS	19x12.5x3.5 (2U enclosure)	Electro-optical input atten; all tube gain path; transformerless; 3 modes (fast, presets, manual); hard bypass; soft-start	\$2,795
Yes	2/Yes	LED	1/4"	1/4"	19x2x4.5	Hard and soft knee; peak RMS switch	\$249
Yes	Dedicated stereo	9 segment LED input/ 5-segment LED GR	1/4" TRS	N/A	8.25x5x1.75		\$399.99
Yes	2/Yes	V	XLR; 1/4" TRS	N/A	19x3.5	Vintage photo-optical compressor sound	\$1,999.99
Yes	Dedicated stereo	VU	XLR; AES/EBU	N/A	19x8x3.5	Midsized stereo width, optional 24-bit digital interface	\$1,999.99
Yes	2/Yes	8-segment LED	XLR; 1/4"	1/4" TRS	19x1.75x5	Hard and soft knee; frequency-dependent LP filter for gate	\$399
Yes	8/Yes	LED	1/4" TRS	1/4" TRS	19x3.5x6	Hard and soft knee; input (+4 dBu/-10 dBu); linking bus; full-featured gate	\$999.95
Yes	2/Yes	LED	1/4" TRS	1/4" TRS	19x1.75x8	Stereo; 15 preset compressor curves for various instruments	\$199.95
Yes	2/Yes	LED	XLR; 1/4" TRS	1/4" TRS	19x1.75x5.3	Combine crossover mode; input (-10 dBV/+4 dBu)	\$599
Yes	2/Yes	10-segment LED	XLR; 1/4"	1/4"	19x1.75x6		\$275
Yes	2/Yes	VU	XLR	1/4"	19x3.5x10.5	Soft knee; Jensen 990 out; balanced/unbalanced; frequency response (5 Hz-80 kHz)	\$2,950
Yes	Mono	VU meter: output/GR	XLR	1/4" TRS	19x3.5x10.5	Soft knee; Jensen 990 out, transformerless	\$1,700
Yes	2/No	LED	XLR; 1/4"	1/4"	19"x1.75"x8"	Window advance; auto-windowing	\$579
Yes	2/Yes	LED	XLR; 1/4"	1/4"	19x1.75x7.25	Dynamics Squared circuitry	\$399
Yes	1/Yes	VU	Analog	N/A	19 x 2 units x 170 mm	Balanced and fully floating I/O	\$2,195
Yes	2/Yes	LED	XLR; AES/EBU; S/PDIF; ADAT; Toslink	N/A	19x1.75x8.2	4 inserts; production/transmission presets, external dvc insert; sample rt conversion	\$3,995
Yes	2/Yes	LED	XLR; AES/EBU; S/PDIF; ADAT; Toslink	N/A	19x1.75x8.2	Digital radiance tube emu; normalize; str dither; 24-bit/96 kHz A/D D/A ext dvc insert; sample rt conversion	\$2,995
Yes	2/Yes	LED	S/PDIF; AES/EBU; Toslink	N/A	1 rackspace	24-bit AD/DA; soft clip; spectral balance	\$1,599
Yes	2/Yes	LED	Analog	1/4"	19 x 2 units x 205 mm	Fairchild 670 attack/release presets	\$3,495
Yes	2/Yes	VU	XLR; 1/4"	N/A	19 x 2 units x 205 mm	Gold-plated switches	\$3,995
Yes	2/Yes	VU	XLR; 1/4"	1/4" TRS	19x3.5x10	Soft knee tube compression	\$699
Yes	Mono	LED	XLR; 1/4" TRS	1/4" TRS	8x8.5x1.63	Soft knee; no solid-state devices in auditory path; transformer I/O; power supply powers 1 or 2 units	\$799 (pwr sup) \$299



# EFFECTS PROCESSORS

Manufacturer	Product	Presets (Factory/User)	Analog Effects	Digital Effects	Simultaneous Effects	Programmable Wet/Dry Mix	Compare/Bypass	Maximum Delay Time	Maximum Pitch Shift Range	MIDI Real-Time Control	Simultaneous MIDI Controllers
Alesis	MicroVerb 4	100/100		Rvrb; chrs; dly; flng; rtry; pch	3	No	No/Yes	1.3 sec	±1 octave	Yes	Yes
Alesis	MidiVerb 4	128/128	N/A	Rvrb; chrs; dly; flng; rtry; pch	3	Yes	Yes/Yes	1.3 sec	±1 octave	Yes	Yes
Alesis	NanoVerb	16/0	N/A	Rvrb; chrs; dly; flng; rtry	3	No	No/Yes	1.3 sec	N/A	No	No
Alesis	Q20	100/200	N/A	Rvrb; chrs; dly; flng; rtry; pch; shift; smplng; ovrdv; pan	8	Yes	Yes/Yes	5 sec	±4 octaves	Yes	Yes
Antares	ATR-1 Auto-Tune Intonation Processor	50/20	N/A	Real-time pitch correction	1	No	Yes/Yes	N/A	±1 octave	Yes	Yes
A.R.T.	DMV-Pro	100/100	N/A	Rvrb; chrs; flng; pch; trml; rtry; phsr; pan; dly	4	Yes	Yes/Yes	5 sec	>2 octaves	Yes	Yes
A.R.T.	FX-1	60/0	N/A	Rvrb; chrs; dly; flng; pch; trml; pan; gate	3	Yes	No/Yes	420 ms	1 octave	No	N
Audio Centron	TFX1-SP	32/0	N/A	Rvrb; dly; flng; chrs; gtd rvrb; rtry	2	No	No/No	455 ms	N/A	No	No
Behringer	EX 3200 Ultralex II Pro	0/0	Enhancer	Spectral enhancer	1	No	No/Yes	N/A	N/A	No	No
beyerdynamic	Vitalizer MKII	0/0	Enhancer	N/A	4	No	Yes/Yes	N/A	N/A	No	No
Crate	SM1-SP	32/0	N/A	Rvrb; dly; flng; chrs; gtd rvrb; rtry	2	No	No/No	455 ms	N/A	No	No
Crate	SM2-SRS	2/0	3-dimensional stereo	N/A	1	No	Yes/Yes	N/A	N/A	No	No
DigiTech	Studio 400	191/100	N/A	Rvrb; chrs; dly; flng; anlg dly	8	Yes	Yes/Yes	2.8 sec	±2 octaves	Yes	Yes
DigiTech	Studio S-100	99/99	N/A	Various	2	Yes	No/Yes	2 sec	-1 octave/+2 octaves	Yes	Yes
DigiTech	Studio S-200	99/99	N/A	Various	2	Yes	No/Yes	2 sec	-1 octave/+2 octaves	Yes	Yes
DigiTech	StudioQuad 4	100/100	N/A	Various	4	Yes	No/Yes	5 sec	±2 octaves	Yes	Yes
DOD	D-12 Stereo delay/24-second sampler	0/0	N/A	Smpt; dly; chrs; flng	4	Yes	No/No	4 banks of 6-sec sampling or 2 banks of 12-sec sampling	N/A	N/A	No
DOD	Dimension 3-D multi-effects processor	0/0	N/A	Dly; rvrb; chrs; flng; phs; pch; trml; rtry; pan	2	Yes	No/No	370 ms	±1 octave	N/A	No
DOD	SR 400D Room Delay	30/0	N/A	Delay	1	No	No/No	4 sec	N/A	N/A	No
Eventide	DSP4000 Ultra-Harmonizer	491/unlimited via PCMCIA SRAM card	N/A	Dozens	Up to 40 internal modules	Yes	Yes/Yes	10 sec	±4 octaves	Yes	Yes
Eventide	DSP4500 Limited Edition Ultra-Harmonizer	1,017/unlimited via PCMCIA SRAM card	N/A	Dozens	Up to 40 internal modules	Yes	Yes/Yes	87 sec in mono; 43.5 sec in stereo	±4 octaves	Yes	Yes
Eventide	H3000D/SE	572/407	N/A	Pch; rvrb; dly; flng; phs; chrs; cmpr	Algorithm dependent (21 algorithms)	Yes	No/Yes	1.5 sec	±3 octaves	Yes	Yes
Eventide	H3000D/SX Dynamic Studio Ultra-dependent (15 ) Harmonizer	295/690	N/A	Dozens	Algorithm dependent (15 algorithms)	Yes	Yes/No	1.5 sec	±3 octaves	Yes	Yes
Eventide	H3500DFX/E Dynamic Ultra-Harmonizer	679/298	N/A	Dozens	Algorithm dependent (23 algorithms)	Yes	No/Yes	95 sec in mono; 47.5 sec in stereo	±3 octaves	Yes	Yes
Eventide	Orville Harmonizer EffectsBrand Processor	Unlim via PCMCIA SRAM cards	N/A	Dozens	2 presets	Yes	Yes/Yes	174 sec in mono; 87 sec in stereo	±4 octaves	Yes	Yes
Independent Audio	Cedar CRX Decrackle	0/0	N/A	Digital decrackling	N/A	No	Yes/Yes	N/A	N/A	No	No
Independent Audio	Cedar DCX Declicker	0/0	N/A	Digital declicking	N/A	No	Yes/Yes	N/A	N/A	No	No
Independent Audio	Cedar DHX Dehiss	0/0	N/A	Digital dehissing	N/A	No	Yes/Yes	N/A	N/A	No	No
Independent Audio	DACS Ltd. Fws FREQue	0/0	Ring module; oscillator; frequency module	N/A	N/A	No	No/No	No	N/A	No	No
Independent Audio	Mutronics Mutator (MIDI)	0/0	Envelope follower	N/A	Envelope follower; LFO	No	Yes/Yes	N/A	N/A	Yes	No
Korg	AM8000R	0/128	N/A	40	4	Yes	Yes/Yes	1.8 sec mono; 800 ms stereo	±2 octaves	Yes	Yes
Korg	DL8000R	0/128	N/A	8 delay taps	8	Yes	Yes/Yes	10 sec mono; 5.2 sec stereo	N/A	Yes	Yes

Discrete  
Processing  
Channels

## ADC/DAC

Overload  
Warning

## Inputs

## Outputs

## Power Supply

Special  
Features

## Price

2	18-bit/18-bit	4-segment LED	1/4" (2)	1/4" (2)	Alesis P3 adapter	Bypass/tap-tempo footswitch, 2 parameter knobs	\$249
2	18-bit/18-bit	18-segment LED; clip light	1/4" (2)	1/4" (2)	Alesis P3 adapter	Automatic level sensing; tap tempo footswitch	\$329
1	18-bit/18-bit	Clip light	1/4" (2)	1/4" (2)	Alesis P3 adapter	Adjustable knob; bypass footswitch	\$135
2	20-bit/256x	4-segment LED w/clip indicator	XLR, 1/4" TRS (2)	XLR, 1/4" TRS (2)	Internal	S/PDIF and ADAT optical in; 48 kHz clock in	\$999
1	20-bit/24-bit	6-segment LED	XLR, 1/4" TRS	XLR, 1/4" TRS	External		\$1,195
4	20-bit	5-segment LED	1/4" (4)	1/4" (4)	External	DEA technology, twin LCD editing interfaces	\$499
2	16-bit/16-bit	Clip light	1/4" (2)	1/4" (2)	External		\$134
2 in/2 out	1-bit/16-bit/64x	Signal/peak LED	1/4" (2)	1/4" (2)	External	32 features; 1 adjustable parameter per program	\$179.99
2	N/A	8-segment LED	XLR, 1/4"	1/4", XLR	Internal	Surround processor; bass shift; treble control; noise reduction	\$249.99
1	N/A	Yes	XLR, 1/4"	1/4", XLR	Internal	Multi-frequency enhancement; stereo expansion	\$699
2 in/out	1-bit/16-bit/64x	Signal/peak LED	1/4" (2)	1/4" (2)	External	32 programs; 1 adjustable parameter per program	\$179.99
2 in/out	N/A	Signal/peak LED	1/4" (2)	1/4" (2)	External	Technowledge-Sound Retrieval System	\$129.99
4	18-bit/128x, 20-bit/64x	Digital level, clip meter	1/4" TRS (2), XLR (2)	TRS (2), XLR (2)	Internal	Dynamic modifiers; optional digital I/O upgrade (AES/EBU, S/PDIF)	\$869.95
2	20-bit	clip LED	1/4" (2)	1/4" (2)	9 VAC	Selectable effects; signal routing configurations	\$219.95
2	20-bit	clip LED	1/4" (2)	1/4" (2)	Internal	Selectable configurations; large display	\$339.95
4	20-bit	Clip (each input)	1/4" (4)	1/4" (4)	Line 9 VAC 2A	Programmable signal routing, LFOs; dynamic filters	\$479.95
4	16-bit/16-bit	Clip LEDs	2	2	External	Reverse playback and LED; jog/shuttle wheel	\$299
2	18-bit/16-bit	Clip LED	1/4" (2)	1/4" (2)	External	Noise reduction w/gate threshold	\$169.95
2	18-bit/16-bit	Clip LEDs	XLR; 6-pin barrier strip	XLR; 6-pin barrier strip	External	Data input in U.S. or metric formats of distance, humidity, temperature	\$329.95
2	20-bit	10-seg clip light	1/4", XLR, AES/EBU, S/PDIF	XLR, AES/EBU, S/PDIF	Internal	Optional 2 MB or 4 MB sampler	\$3,995
2	24-bit	10-seg clip light	1/4", XLR, AES/EBU, S/PDIF	XLR; AES/EBU, S/PDIF	Internal	87-sec mono internal sampler (43.5-sec in stereo)	\$4,995
2 (algorithm dependent)	16-bit	10-segment clip light	XLR (pin 3 hot)	XLR (pin 3 hot)	Internal		\$2,695
2 (algorithm dependent)	16-bit	10-segment clip light	XLR (pin 3 hot)	XLR (pin 3 hot)	100-130 or 200- 240 volts AC, 50/60 Hz		\$1,995
2 (algorithm dependent)	16-bit	10-segment clip light	XLR (pin 3 hot)	XLR (pin 3 hot)	100-130 or 200-240 volts AC, 50/60 Hz	95-sec mono sampler (47.5-sec stereo)	\$3,595
4 + 4	24-bit	9-segment LED	1/4", XLR, S/PDIF, AES/EBU	XLR; AES/EBU, S/PDIF	Internal	24-bit/96 kHz; 4 MB sampler, UltraShifter software; routing matrix	\$5,695
2	N/A	N/A	AES/EBU; S/PDIF	AES/EBU; S/PDIF	Internal	Real-time declick	\$6,495
2	N/A	N/A	AES/EBU; S/PDIF	AES/EBU; S/PDIF	Internal	Real-time declick	\$5,995
2	N/A	N/A	AES/EBU; SPDIF	AES/EBU; SPDIF	Internal	Real-time dehiss	\$6,895
2	N/A	LED	1/4" TRS	1/4" TRS	90-250 VAC		\$1,099
2	N/A	N/A	1/4"	1/4"	Internal	Stereo panning	(unbal) \$1,125 (balanced) \$1,275
2	18-bit linear/128x	Digital clip	1/4" (2)	1/4" (2)	9 VAC		\$600
2	18-bit/128x	Digital clip	1/4" (2)	1/4" (2)	9 VAC		\$600



# EFFECTS PROCESSORS

Manufacturer	Product	Preset (Factory/User)	Analog Effects	Digital Effects	Simultaneous Effects	Programmable Wet/Dry Mix	Compare/Bypass	Maximum Delay Time	Maximum Pitch Shift Range	MIDI Real-Time Control	Simultaneous MIDI Controllers
Korg	PX2	0/38	N/A	Comp, ovdr, dstrtn, reverb, wah, chorus, pitch, flanger, vibration, tremolo, pan delays, cabinet	6	No	No/Yes	730 ms	±2 octaves	No	No
Lexicon	MPX 1	200/50	N/A	Rvrb, dly, echo, loop, trml, chorus, flngr, rty, pch; phsr, more	5	Yes	Yes/Yes	2 sec	5.5 octaves	Yes	Yes
Lexicon	MPX 100 Dual Channel Processor	240/16	N/A	True stereo reverbs, tremolo, rotary, chorus, flange, pch; dtn; dly, echo	2	Yes	Yes/Yes	5.7 sec	±3 octaves	Yes	Yes
Lexicon	MPX G2 Guitar Effects Processor	250/50	Distortion, overdrive, noise gate	Reverbs, delays, pitch, flanger, phase, vibration, more	5	Yes	Yes/Yes	20 sec (JamMan, mono FX), 10 sec (stereo FX)	>3 octaves	Yes	Yes
Lexicon	PCM 81	450/50	N/A	Chorus, delay, feedback/cross-feedback, filters, glide, module, pan, pitch, RVB	Algorithm dependent	Yes	Yes/Yes	20 sec	±3 octaves	Yes	Yes
Lexicon	PCM 91	450/50	N/A	Reverbs, delay, echo, expand, modulation, split EQ, ambience	2	Yes	Yes/Yes	2.5 sec	N/A	Yes	Yes
Line 6	POD	36/0	N/A	8	3	Yes	No/No	3.2 sec	N/A	Yes	Yes
Miles Technology	MTI-3 TriSonic Imager	1	LCR sweet-spot enlarger, surround, spreadsound	N/A	2	No	No/No	N/A	N/A	No	No
Peltronics	RTSP-1600 MKII	30/69	Flanger, chorus, doubling	Delay	2	Yes	No/Yes	700 ms (expandable)	N/A	Yes	Yes
Phonic Hi-Tech	Verbiflex	256/0	N/A	Yes	1	Yes	Yes/Yes	N/A	N/A	No	No
Rocktron	IntelliFlex	80/80	N/A	Chorus, delay, reverb, dynamic docker, 4-voice pch, hush noise reduction	4	Yes	Yes/Yes	1.5 sec	+1 octave/-2 octaves	Yes	Yes
Rocktron	Multivalve	128/128	N/A	2 tap dly, reverb, chorus, phaser, tremolo, flanger, pitch, auto-pin, spkr sim, hush noise reduction	10	Yes	Yes/Yes	1 sec	+1 octave/-2 octaves	Yes	Yes
Roland	Roland GP-100 Guitar Preamp/Processor	200/200	Comp/lim, wah/auto wah, 4-band EQ, noise supp, phsr, flnger, foot vol, trem/pan, vibr, slow gear, 2 FX loops, feedbacker	14 modeled preamps, 12 modeled speaker simulators, 5-part mono/stereo harmonist, 4-tap/tempo/ducking delays, mon/ster chorus, reverb	15	Yes	Yes/Yes	4.8 sec	±2 octaves	Yes	Yes
Roland	SDE-330	100/200	N/A	3	3	No	Yes/Yes	2.9 sec	±1 octave	Yes	Yes
Roland	SRV-3032, 3030D	N/A	N/A	Reverb	2	Yes	Yes/Yes	N/A	N/A	Yes	Yes
Roland	VT-1	32/4	N/A	Voice transfer	2	Yes	No/Yes	N/A	±1 octave	No	Yes
Sony	DPS-V55	200/200	N/A	45 algo, reverb, delay, flanger, chorus, pitch, EQ, comp, rotary	4	Yes	No/Yes	2,720 ms	±2.4 octaves	No	N/A
Sony	DPS-V77	198/198	N/A	Reverb, flange, chorus, delay, pitch, amplifier simulator	4	Yes	Yes/Yes	5,460 ms	±2.4 octaves	Yes	Yes
Sony	HR-GP5	100/100	N/A	Reverb, flange, chorus, delay, pitch, amplifier simulator	7	Yes	Yes/Yes	1,364 ms mono, 682 ms stereo	±2.4 octaves	Yes	Yes
Spatializer	Retro	0/0	3-D audio	N/A	1	No	No/Yes	N/A	N/A	No	No
Symetrix	606 Delay FX Machine	10/99	N/A	Delay, chorus, room simulator, flanger, auto pin, filter	2	Yes	No/Yes	2.5 sec	N/A	Yes	No
TC Electronic	1210 Spatial Expander + Stereo Chorus Flanger	N/A	Flanger, pitch module, expander	N/A	3	No	No/Yes	66 to 22 ms	N/A	No	No
TC Electronic	1280 Stereo Digital Audio Delay	4/4	N/A	2 delay channels	2	No	Yes/Yes	2.5 sec with chip expander	N/A	Yes	Yes
TC Electronic	1380 Multitap Digital Audio Delay	4/4	N/A	1	1	No	Yes/Yes	5 sec with chip expander	N/A	Yes	Yes
TC Electronic	2290	100/100	N/A	1	2	Yes	Yes/Yes	8 sec	N/A	Yes	Yes
TC Electronic	FireworX	200/100	N/A	35e	DSP (space dependent)	Yes	Yes/Yes	3 sec	±2 octaves	Yes	Yes
TC Electronic	G-Force	200/100	N/A	Reverb, delay, pitch, phaser, flanger, comp, pan/tremlo, modulation, more	8	Yes	Yes/Yes	1,480 ms	2 octaves	Yes	Yes
TC Electronic	M2000	256/256	N/A	Rvrb, dly, chrs, flngr, comp, pan; trml; limg; de-es, exp, str enhnc	2	Yes	Yes/Yes	1.2 sec	2 octaves	Yes	Yes

Discrete Processing Channels	ADC/DAC	Overload Warning	Inputs	Outputs	Power Supply	Special Features	Price
1	18 bit	N/A	1/4", 1/8"	1/4"	2 AA batteries; optional 9V adapter	Metronome, toner, 32 drum patterns	\$250
2	18-bit/20-bit	6-segment LED; clip light	1/4" (2); XLR (2); S/PDIF	1/4" (2); XLR (2); S/PDIF	Internal	Dual processors; tap tempo; morphing; help; flexible routing/switching; optional MPX R1 MIDI Remote Controller	\$1,299.99 (pedalboard) \$500
2	20-bit	Dual, 2-stage headroom	1/4" (2)	1/4" (2); S/PDIF	9 VAC 1A wall trans	True stereo/dual-channel processing; adjustable parameter knob	\$299
2	24-bit	Dual, 2-stage headroom	1/4" (2)	1/4" TRS (2); XLR (2)	Internal	Routes effects to amplifier's input and/or effects loop; analog tone controls; tuner; soft row; optional MPX R1 MIDI Remote Controller	\$1,499 (pedalboard) \$500
2	18-bit	5-segment LED; clip light	1/4"/XLR combo (2); S/PDIF; AES/EBU	1/4" (2); XLR (2); S/PDIF; AES/EBU	Internal	PCMCIA card slot; front-panel adjustable knob; tap tempo; 3 D effects	\$2,995
2	18-bit/18-bit	5-segment LED; clip light	1/4"/XLR combo (2); S/PDIF; AES/EBU	1/4" (2); XLR (2); S/PDIF; AES/EBU	Internal	PCMCIA card slot; keyword search; split algorithms; digital compressor	\$2,995
1	24-bit/20-bit	Clip light	1/4" guitar input	1/4" TRS	External AC	AIR direct out	\$399
2	N/A	N/A	XLR (4); 1/4" TRS (2)	XLR (5); 1/4" TRS (3)	50/60 Hz (120 or 240 VAC available)	Expandable stereo/mono sources; creates L/C/R and surround outs from 2-channel stereo	\$599
1	16-bit/16-bit (both upgradable)	N/A	1/4"	1/4" (3)	Internal 110/220 VAC	Random modulation waveform; upgradable hardware/software; hybrid analog/digital design; no DSPs	\$549
2	16-bit	Dual-color peak LEDs	1/4"	1/4"	Internal		\$269
1	16-bit/128x	5-segment LED	1/4" (2)	1/4" (2)	External	Analog signal path separate from DSP	\$749
1	16-bit/128x	5-segment LED	1/4" (2)	1/4" (2)	External	Tube front end	\$999
2	22-bit/128x	16-segment LED; clip light	1/4" (1)	1/4" (4)	Internal	COSM	\$995
2	16-bit	7-segment LED	1/4" (2)	1/4" (2)	Internal	3-D RSS technology	\$995
2	24-bit	Yes	XLR; 1/4" TRS (2)	XLR; 1/4" TRS (2)	Built-in	Dynamic separation; preview w/user samples; digital I/O	\$695, \$995
1	16-bit/16-bit	Clip light	1/4"	1/4"; RCA (2)	AC adapter	Real-time control over pitch and format	\$395
4	20-bit	Clip light	1/4"	1/4"	Internal	52-bit DSP engine; surround-sound; "Designer" presets	\$550
2	20-bit	Clip light	XLR (2); AES/EBU; S/PDIF	XLR (2); AES/EBU; S/PDIF	Internal	Morphing; dual effects blocks; 52-bit DSP	\$1,775
1	18-bit	Clip light	1/4"	1/4" (2)	Separate PSV	Amplifications simulation w/mic placements	\$595
2	N/A	LED	1/4" TRS	1/4" TRS	Internal	3-D audio; mono compatible	\$699
2	20-bit	4-segment LED; clip light	1/4" TRS	1/4" TRS	Internal	6 modulation sources; room simulators; tap tempo	\$649
2	N/A	LED	1/4"; XLR	1/4"; XLR	Internal	Uses Haas principle to create expansion	\$1,684
2	18-bit	Overload LED	XLR	XLR	Internal	1 MHz sample rate	\$2,446
1	18-bit	Overload LED	XLR	XLR	Internal	1 MHz sample rate	\$2,446
1	1-bit	LED	1/4"; XLR	1/4"; XLR	Internal	1 MHz sample rate	\$1,995
2	24-bit	Overload LED	XLR	XLR	Internal	Vocoder	\$2,195
2	24-bit	Clip light	1/4" (2); S/PDIF	1/4" (2); S/PDIF	Internal	"Intelligent" pitch shifting by Wave Mechanics; 5x14-LED "Marquee"	\$1,795
2	20-bit	LED	XLR (2); AES/EBU; S/PDIF	XLR (2); AES/EBU; S/PDIF	Internal	Dynamic morphing; preset glide	\$1,495



# EFFECTS PROCESSORS

Manufacturer	Product	Presets (Factory/User)	Analog Effects	Digital Effects	Simultaneous Effects	Programmable Wet/Dry Mix	Compare/Bypass	Maximum Delay Time	Maximum Pitch Shift Range	MIDI Real-Time Control	Simultaneous MIDI Controllers
TC Electronic	M3000	250/200	N/A	Reverb; delay; chorus; flange; EQ; compressor; pan; tremolo; limiter; de-es, exp. gate; stereo enhancer	2	Yes	No/Yes	1.2 sec	2 octaves	Yes	Yes
TC Electronic	M5000 Digital Audio MainFrame	212/100	N/A	Up to 4	4	Yes	Yes/Yes	1.340 ms (670 ms per side)	±1 octave	Yes	No
TC Electronic	Unity	100/200	N/A	Rev; diy; chr; flng; comp; pan; lrm; lim; de-es, exp; stereo enhnc; dyn	3	Yes	Yes/Yes	1.2 sec	2 octaves	Yes	Yes
Yamaha	D5000	100/0	N/A	Single/dual delay; freeze record/playback; sample and hold	2	No	Yes/Yes	5 sec (stereo); 10 sec (mono)	N/A	Yes	Yes
Yamaha	ProR3	90/0	N/A	Reverb; room simulation; echo; chorus; symphonic; flanger; pitch	3	Yes	Yes/Yes	N/A	±1 octave	Yes	Yes
Yamaha	REV100	99/0	N/A	Stereo reverb; reverb; delay; flanger; chorus; symphonic	0	Yes	Yes/Yes	N/A	N/A	Yes	Yes
Yamaha	REV500	100/0	N/A	Reverb; room simulation; echo	0	Yes	Yes/Yes	200 ms	N/A	Yes	Yes
Yamaha	SPX1000	40/59	N/A	Reverb; chrs; echo; frz; distortion; trig pan; delay; symphonic; tremlo	0	Yes	Yes/Yes	5.2 sec	±1 octave	Yes	Yes
Yamaha	SPX990	80/0	N/A	Reverb; delay; echo; early ref; mod; pitch; pan; frz; chorus; symphonic	3	Yes	Yes/Yes	1,480 ms	±2 octaves	Yes	Yes
Zoom	Studio 1201	363/0	N/A	33	2	No	No/No	1.4 sec	±1 octave	No	No
Zoom	Studio 1204	512/100	N/A	32	2	No	No/Yes	740 ms	±1 octave	Yes	Yes

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2	24-bit	LED	(2) XLR; AES/EBU; S/PDIF; ADAT; Toslink	(2) XLR; AES/EBU; S/PDIF; ADAT; Toslink	Internal	Dynamic morphing; preset glide	\$2,495
1/up to 4	18-bit/20-bit	LED	XLR; AES/EBU	XLR; AES/EBU	Internal	Expandable; can be updated via Internet	starting at \$4,000
3	24-bit	Meter	AES/EBU; S/PDIF; ADAT; Toslink	AES/EBU; S/PDIF; ADAT; Toslink	Internal	Software interface within the Yamaha 02R	\$1,495 (sec. shwr lic \$795)
2	20-bit	Clip light	XLR (2)	XLR (2)	Internal		\$1,499
2	20-bit	Clip light	XLR (2)	XLR (2)	Internal		\$1,299
2	16-bit	Clip light	1/4" (2)	1/4" (2)	Internal		\$299
2	20-bit/64x/20-bit/8x	Clip light	1/4" (2); XLR (2)	1/4" (2); XLR (2)	Internal		\$499
2	16-bit	Clip light	1/4" (2)	1/4" (2)	Internal		\$1,829
2	20-bit/64x/20 bit/8x	Clip light	XLR (2)	XLR (2)	Internal		\$1,179
2	18-bit/64x/18-bit/8x	Clip light	1/4" (2)	1/4" (2)	External 9V	Vocoder; auto filter; Karaoke and vocal-distortion effects	\$219.99
2	18-bit/128x	Clip light	1/4" (2)	1/4" (2)	External 9V	Mic in for vocoder effects; vocal distortion; rotary effect	\$319.99

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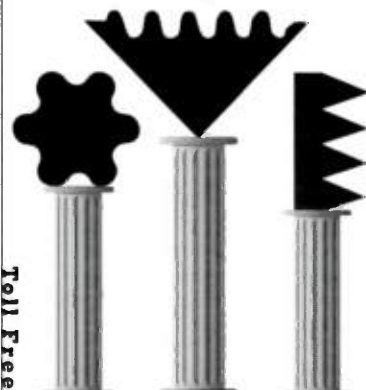


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# EQUALIZERS

Manufacturer	Product	Analog/Digital	Programmable	Type/ Bandwidth	# of Channels/ # of Bands	Frequency Range (Parametric)	Constant Q	Filters	Analog I/O #/Type
Alesis	MEQ-230	Analog	No	Graphic; 1/3 octave	2/30	20 Hz–20 kHz	No	N/A	(2) 1/4", (2) phono
Aphex Systems	109	Analog	No	Parametric; variable 0.66–7.2	Dual 2-band (or single 4-band)	20 Hz–2 kHz; 200 Hz–20 kHz	Yes (variable)	Switchable shelving	1/4" TRS (-10/+4)
API	550b EQ	Analog	No	Quasiparametric or shelving	1/4	30 Hz–20 kHz	No	N/A	XLR in API frame
API	560b EQ	Analog	No	Graphic; 1 octave	1/10	31 Hz–16 kHz	No	N/A	XLR in API frame
Avalon Design	AD2055	Analog	No	Parametric active/passive	2/4	HF: 15–25 kHz; HMF: 160 Hz–20 kHz; LMF: 35 Hz– 4.5 kHz; LF: 18–450 Hz	Yes (mid bands vari- able Q 3–3.0)	N/A	XLR (+30 dB)
CLM	DB500S	Analog	No	Parametric with dynamic filter bands	2/4	LF: 40–300 Hz; LMF: 200 Hz–2 kHz; HMF: 1–8 kHz; HF: 1.5–20 kHz	No	Low cut: 15 Hz– 16 kHz; high cut: 75 Hz–60 kHz	(2) XLR per channel
DOD	SR 231QX	Analog	No	1/3 octave	2/31	N/A	Yes	ISO	1/4"
DOD	SR 430QX	Analog	No	2/3 octave	2/15	N/A	Yes	ISO	1/4"
DOD	SR 830QX	Analog	No	2/3 octave	2/15	N/A	Yes	ISO	1/4"
DOD	SR 831QX	Analog	No	1/3 octave	1/31	N/A	Yes	ISO	1/4"
Drawmer	1961 Tube Mastering EQ	Analog	No	Mastering; parametric	2/4	3 octaves	No	LP, HP	(2) XLR
Focusrite	Tone Factory	Analog	No	Multiparametric	1/2 (plus bass, mid, treble)	40 Hz–1 kHz; 500 Hz–20 kHz	No	LP, HP	XLR, 1/4"
HBB	Radius 20	Analog	No	Parametric; Q range 4.5	2/4	30 Hz–20 kHz	No	N/A	(2) XLR
Independent Audio	Calrec RQ Series RQQ 2200	Analog	No	Parametric	2/4	22 Hz–22 kHz	No	HP; LP	(2) XLR (2) 1/4"
Manley Labs	Massive Passive Stereo Tube EQ	Analog	No	Quasiparametric	2/4	22 Hz–1 kHz; 82 Hz–3 kHz; 220 Hz–10 kHz; 560 Hz–27 kHz	No	HP; LP	(2) XLR, (2) 1/4"
Millennia Media	NSEQ-2 Twin Analog Topology Parametric Equalizer	Analog	No	Parametric; 4	2/4	20 Hz–25 kHz	Yes	High/low shelving	XLR
Sabine	Graphi-Q	Digital	Yes	Multigraphic: 31 digital filters on 1/3 octave ISO; parametric: 12 filters per channel	2/31	20 Hz–20 kHz	Yes	HP; LP	(2) XLR-3; (2) 1/4" TRS
Sabine	Graphi-Q	Digital	Yes	Multigraphic: 31 digital filters on 1/3 octave ISO; parametric: 12 filters	1/31	20 Hz–20 kHz	Yes	HP; LP	XLR-3 in, (2) XLR-3 out; 1/4" TRS in, (2) 1/4" TRS out
Sabine	Power-Q ADF-4000	Digital	Yes	Multigraphic: 31 digital filters on 1/3 octave ISO; parametric: 12 filters	1/31	20 Hz–20 kHz	Yes	HP; LP	XLR-3 in, (2) XLR-3 out; 1/4" TRS in, (2) 1/4" TRS
Sabine	Real-Q2	Digital	Yes	Multigraphic: 31 digital filters on 1/3 octave ISO	1/31	20 Hz–20 kHz	Yes	HP; LP	XLR-3 in, (2) XLR-3 out; 1/4" TRS in, (2) 1/4" TRS
Speck	EQ16-32	Analog	No	Semiparametric	16 stereo channel/ 3 bands per channel	LF: 50–500 Hz; MF: 500 Hz– 5 kHz; HF: 5–15 kHz	Yes	N/A	(32) 1/4" TRS
Summit Audio	EQF-100	Analog	No	Quasiparametric	1/4	5 Hz–100 kHz	Yes	HP	XLR
Summit Audio	EQF-200B	Analog	No	Program EQ	2 channel	5 Hz–100 kHz	No	HP	(4) XLR
Summit Audio	MPE-200	Analog (digital control)	Yes	Parametric	2/4	2 Hz–200 kHz	Yes	HP; LP	(4) XLR
White	4400	Analog	No	1/3 octave	1/28	N/A	No	L-C active	Barrier strip
White	4700	Analog filters/ digitally controlled	Yes	1/3 octave	1/28	N/A	No	R-C active	Barrier strip
White	4828	Analog	No	1/3 octave	1/28	N/A	No	R-C active	XLR, 1/4" TRS
XTA	DP202	Digital	Yes	Parametric; 1/32 to 2 octave	2/8+	20 Hz–20 kHz	Yes	HP; LP	XLR

Digital I/O #/Type	Input/Output Gain Control	Max Boost/Cut	Operating Level	Hard Bypass	Dynamic Range	THD	Weight	Dimensions	Price
N/A	No/Yes	±12 dB	-10 dB	Yes	107 dB, A-weighted	<0.005% 0 dB, 20 Hz-20 kHz	2.5	1.75x4x19	\$299
N/A	Yes/Yes	±15 dB	+4 dB	Yes	108 dB	>0.15% @ +10 dBu	3	19x1.75x5.75	\$449
N/A	No/No	±12 dB	+4 dB	Yes	130 dB	<0.07%	21	500 module	\$1,295
N/A	No/No	±12 dB	+4 dB	Yes	130 dB	<0.07%	21	500 module	\$1,295
N/A	Yes/Yes	±24 dB	+4 dB	Yes	123 dB	0.05%	17	19x3.5x12	\$4,000
N/A	Yes/Yes	±20 dB	+4 to -10 dB	Yes	118 dB	0.001%	11	19x8x5.25	\$3,299
N/A	Yes	±12 dB	-10 to +4 dB	Yes	N/A	0.004%	N/A	19x6x3.5	\$369.95
N/A	Yes	±12 dB	-10 to +4 dB	Yes	N/A	0.004%	N/A	19x6x1.75	\$249.95
N/A	Yes	±12 dB	-10 to +4 dB	Yes	N/A	0.004%	N/A	19x6x1.75	\$249.95
N/A	Yes	±12 dB	-10 to +4 dB	Yes	N/A	0.004%	N/A	19x6x3.75	\$249.95
N/A	Yes/No	±18 dB	-10 to +4 dB	Yes	120 dB	<0.01%	16	3.5x8x19	\$2,349
N/A	Yes/Yes	±18 dB	+4 dB	Yes	>96 dB	0.002%	N/A	19" rack unit	\$749
	Yes/Yes	±15 dB	+4 to -10 dB	Yes	106 dB; 0 dB gain	N/A	5.5	3.5x7.9x19	\$749
N/A	No/No	±16 dB	+4 dB	No	-95 dB	0.005%	12	19x1.75x12	\$2,360
N/A	No/No	±20 dB	+4 dB	No	122 dB	0.05%	24	5.25x19x10	\$4,800
N/A	No/No	±20 dB	+4 dB	Yes	>100 dB	>.002%	25	3.5x12x19	\$2,995
RS232 serial I/O	Yes/Yes	Graphic: ±6 or ±12 dB parametric: +12 to -84 dB	+29 dBv	Yes	>110 dB	<0.01% @ 1 kHz	9	19x3.5x9.5	(GRQ-31102) \$1,299 (GRQ-3102S) \$1,099
RS232 serial I/O	Yes/Yes	Graphic: ±6 or ±12 dB, parametric: +12 to -84 dB	+29 dBv	Yes	>110 dB	<0.01% @ 1 kHz	9	19x3.5x9.5	(GRQ-3101) \$799.95 (GRQ-3101S) \$699.95
(1) RS 232 serial I/O	Yes/Yes	Graphic: ±6 or ±12 dB, parametric: -12 to -84 dB	+29 dBv	Yes	>110 dB	<0.01% @ 1 kHz	9	19x3.5x9.5	\$1,799
RS 232 serial I/O	Yes/Yes	Graphic: +15 to -15 dB	+29 dBv	Yes	>110 dB	<0.02% @ 1 kHz	9	19x3.5x9.5	\$1,999.95
N/A	No/No	±15 dB	+4 dBu	Yes	>110 dB	0.003%	22	3 rackspace	\$1,895
N/A	No/No	+18 to -20 dB	+4 dB	Yes	105 dB	0.05% @ +4 dBm	16	3.5x10.5x19	\$3,950
N/A	No/No	20 dB	+4 dB	Yes	105 dB	0.05% (unweighted)	19	3.5x10.5x19	\$2,500
No	Yes/Yes	±16 dB	+4 dB	Yes	>120 dBu	<0.0025% @ +20 dBu	27		\$4,495
N/A	Yes/Yes	10 dB	2 dBu (0.775V rms)	Yes	108 dB	<0.02%	8	3.5x19x8	\$1,435
N/A	Yes/Yes	12 dB	0 dBu (0.775V rms)	Yes	100 dB	<0.05%	9	1.75x19x12	\$1,165
N/A	Yes/Yes	12 dB	0 dBu (0.775V rms)	Yes	109 dB	<0.02%	7	3.5x19x9.2	\$1,000
XLR; AES/EBU	Yes/Yes	-25 to +155 dB	+4 dBu	No	105 dB	0.02%	8	1.75x19x11.8	\$2,475



# MIDI INTERFACES, PATCH BAYS & PROCESSORS

Manufacturer	Product	Computer Interface	# of MIDI Ins/Outs	Merging	Filtering	Rechannelizing	Controller Remapping	Keyboard Split/Zones	# of Patches	Synchronization Type	Special Features	Price
Digital Music	MX-28M MIDI patch bay/merger	N/A	2/8	Yes	No	Yes	No	Yes	N/A	N/A	Mapping; transposition; LED data indicators; panic button	\$399
Digital Music	MX-28S MIDI Patch Bay	N/A	2/8	No	No	No	No	N/A	N/A	N/A	Output disable; LED data indicators	\$89
Digital Music	MX-8 MIDI Patchbay/Processor	N/A	6/8	Yes	Yes	Yes	No	Yes	50	N/A	Vel scaling/cmpndr; Velocity cross-switch/MIDI delays; pitch chaining; alphanumeric display	\$399
Digital Music	Funnel	N/A	6/1	No	No	No	No	N/A	N/A	N/A	Auto MIDI input selector for routing SysEx data	\$79
Emagic	AMT 8	Mac, Win 95, 98, NT	8/8 (expand to 64/64)	Yes	Yes	No	No	N/A	32	N/A	USB/serial (Mac and PC); connects w/other AMT 8 and Unitor 8 units (up to 8)	N/A
Emagic	Unitor 8	Mac, Win 95, 98, NT	8/8 (expand to 64/64)	Yes	Yes	No	No	N/A	32	SMPTE, VITC (generates and reads)	VTC burn-in; updatable firmware; click in; OMS; Free MIDI/MME comp	\$799
Independent Audio	DACS Ltd. MIDO Patch Bay	N/A	10/10	No	No	No	No	N/A	40	N/A	Uses 1/4" patch cords	\$295
JLCooper	MLA-1/MLA-10	N/A	4/4	No	No	No	No	N/A	N/A	N/A	Extends MIDI cable runs over 1000'	\$369.95; \$499.95
Mark of the Unicorn	Fast Lane	Mac	1/3	No	No	No	No	N/A	N/A	N/A	Powers off computer; bypass allows use of MIDI controller when computer is off	\$59
Mark of the Unicorn	Micro Express	USB	4/6	Yes	Yes	Yes	No	N/A	16 (8 presets/8 user)	SMPTE, MTC	Operates w/o computer; supplies MMC; free-wheels over SMPTE drop-outs; converts click to MIDI; 2 pedal ins	\$295
Mark of the Unicorn	MIDI Express XT	USB	8/9	Yes	Yes	Yes	No	N/A	16 (8 presets/8 user)	SMPTE, MTC	Operates w/o computer; supplies MMC; free-wheels over SMPTE drop-outs; converts click to MIDI; 2 pedal inputs	\$395
Mark of the Unicorn	MIDI Timepiece AV	USB	8x8	Yes	Yes	Yes	No	N/A	8 base setups; 128 patches	SMPTE, MTC; video and word clock; Digidesign Superclock	Operates w/o computer; supplies all SMPTE firm rates; 4x MIDI data rate on Mac; 2 pedal inputs	\$595
Mark of the Unicorn	PC-MIDI Flyer	Win	2/2	No	No	No	No	N/A	N/A	N/A	Powers off computer; bypass allows use of MIDI controller when computer is off	\$89
Mark of the Unicorn	Pocket Express	Mac, Win	2/4	No	No	No	No	N/A	N/A	SMPTE, MTC	Bypass allows use of MIDI controller when computer is off; SMPTE free-wheeling over drop-outs	\$165
MIDI Solutions	Mapper	N/A	1/1	No	No	No	Yes	N/A	N/A	N/A	MIDI-powered; program via SysEx	\$99
MIDI Solutions	Merger, Quadra Merge, M8	N/A	2/1; 4/1; 8/1	Yes	No	No	No	N/A	N/A	N/A	MIDI-powered	\$79; \$129; \$279
MIDI Solutions	Relay R8	N/A	1/1	No	No	No	No	N/A	128	N/A	MIDI-powered	\$99; \$429
MIDI Solutions	Router	N/A	1/2	No	Yes	Yes	No	Yes/10	N/A	N/A	MIDI-powered; prog via SysEx	\$99
MIDI Solutions	Thru, Quadra Thru, T8	N/A	1/2; 1/4; 1/8	No	No	No	No	N/A	N/A	N/A	All messages appearing at In is sent to all Outs; MIDI-powered	\$49; \$59; \$199
MIDI Solutions	Velocity Converter	N/A	1/1	No	No	No	No	N/A	40	N/A	Applies velocity curves to MIDI data; MIDI-powered; program via SysEx	\$99
Midiman	Bi Port 2x4	Mac; Win	32/64	No	No	No	No	N/A	N/A	SMPTE, MTC	Serial port interface	\$179.95
Midiman	Digipatch 12x6	Mac; Win	N/A	No	No	No	No	N/A	N/A	N/A	Coax/optical S/PDIF, ADAT light pipe; patch bay	\$699.95
Midiman	Macman	Mac	1/3	No	No	No	No	N/A	N/A	N/A	Passive Thru; serial Thru (ground port); serial cables included	\$59.95
Midiman	Merge 2x2	N/A	2/2	Yes	No	No	No	N/A	N/A	N/A		\$99.95
Midiman	Mini Macman	Mac	1/1	No	No	No	No	N/A	N/A	N/A	Serial cable included	\$39.95
Midiman	Portman 2x4	Win	2/4	No	No	No	No	N/A	N/A	N/A	32-ch in/64-ch out; includes cable	\$179.95

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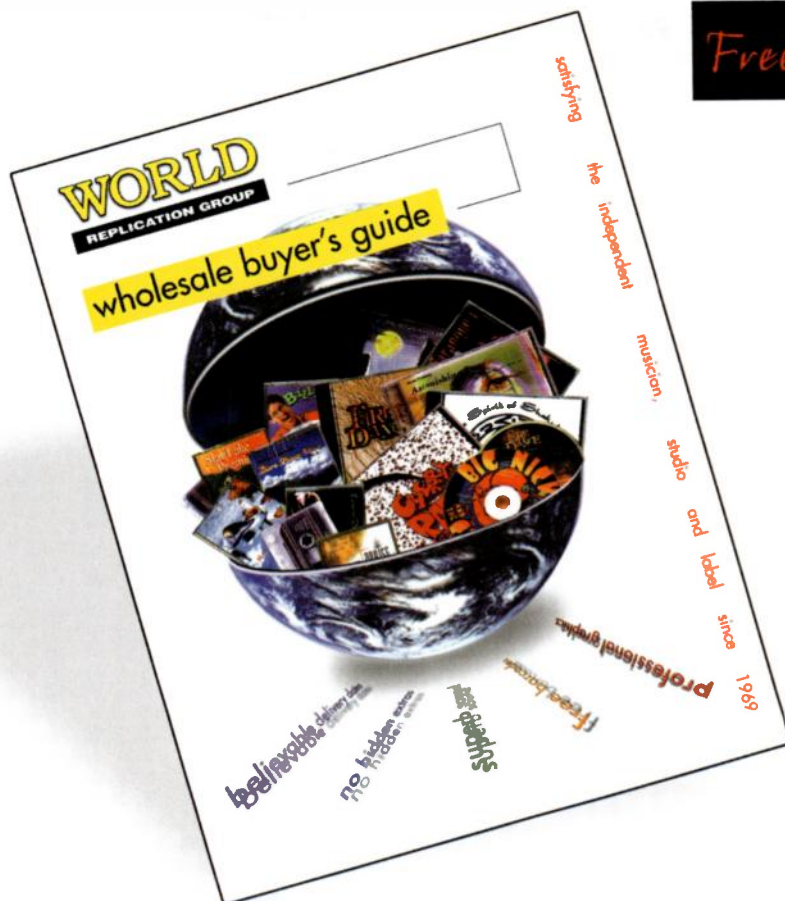
# MIDI INTERFACES, PATCH BAYS & PROCESSORS

Manufacturer	Product	Computer Interface	# of M/D Ins/Outs	Merging	Filtering	Rechannellizing	Controller Remapping	Keyboard Split/Zones	# of Patches	Synchronization Type	Special Features	Price
Midiman	Portman 4x4S	Win	4/4	No	No	No	No	N/A	N/A	SMPTE, MTC	External 4x4 w/SMPTE; 4x4 patch bay/merger; native Win 95 drivers	\$279.95
Midiman	Portman PC/P	Win	1/1	No	No	No	No	N/A	N/A	N/A	Includes cable (parallel)	\$79.95
Midiman	Portman PC/S	Win	1/1	No	No	No	No	N/A	N/A	N/A	Includes serial cable	\$79.95
Midiman	Thru 1x4	N/A	1/4	No	No	No	No	N/A	N/A	N/A		\$59.95
Midiman	Thru 3x8	N/A	3/8	No	No	No	No	N/A	N/A	N/A		\$99.95
Midiman	USB Midiport 2x2	Mac, PC, Mac	2/2	No	No	No	No	N/A	N/A	N/A	USB port interface	\$129.95
Midiman	Winman 1x1	Win	1/1	No	No	No	No	N/A	N/A	N/A		\$69.95
Midiman	Winman 2x2	Win	2/2	No	No	No	No	N/A	N/A	N/A		\$89.95
Midiman	Winman 4x4/S	Win	4/4	Yes	No	No	No	N/A	N/A	SMPTE, MTC	64-channel; ISA, native Win 95 drivers; 4x4 patch bay	\$249.95
Opcodes	MIDI Engine 2 Port/SE	Win	2/2	No	Yes	Yes	Yes	N/A	N/A	Reads/writes SMPTE; converts to MTC; routes MTC and MMC		\$199.95
Opcodes	MIDI Translator PC	Win	2/2	No	Yes	No	Yes	N/A	N/A	Passes MTC and MMC	Up to 4 units dock for expansion up to 128 channels	\$129.95
Opcodes	MOX-32M	Win/MIDI ISA/EISA card)	2/2	Yes	Yes (in some modes)	No	Yes (in some modes)	N/A	N/A	Reads/writes SMPTE (converts to MTC)		\$249.95
Opcodes	PC MIDI Card II	Win (ISA/EISA card)	1/1	No	Yes	Yes	Yes	N/A	N/A	Passes MTC, MBC, MMC		\$99.95
Opcodes	Studio 128X	Mac, Win	8/9	Yes	Yes	Yes	Yes	Yes/up to 128 (Mac only)	8 user, 4 preset	SMPTE, MTC; routes MMC	Route/merge any In(s) to any Out(s); thru port, footswitch/trigger in	\$429
Opcodes	Studio 5 LX	Mac	15/15	Yes	Yes	Yes	Yes	Yes/up to 128 splits and zones	128	Reads/writes/converts SMPTE to MTC; routes/passes MTC, MMC	Networks w/other Studio 5 units; Velocity scaling; studio patch editor (Mac); thru ports	\$1,195
Opcodes	Studio 64X	Mac, Win	4/5	Yes	Yes	Yes	Yes	Yes/128 (Mac only)	4 user, 4 preset	Reads/writes SMPTE to MTC; conversion routes MTC and MMC	Panic button; tune setting; Velocity scaling; studio patch editor (Mac); thru port	\$319.95
Opcodes	Studio 64XTC	Mac, Win	4/6	Yes	Yes	Yes	Yes	Yes/up to 128	4 user, 4 preset	ADAT sync; word clock/Super-clock out; video/block burst ref in; SMPTE, MTC, MMC	Panic button; networks w/Studio 4; OMS compatible; Velocity scaling; OMS studio patches (Mac)	\$495
Opcodes	Translator II	Mac	1/3	No	No	No	No	N/A	N/A	Passes MTC	Thru port	\$59.95
Opcodes	Translator Pro	Mac	2/6	No	No	No	No	N/A	N/A	Passes MTC, MMC	Dual thru ports	\$109.95
Rolls	RFX MP1288 MIDI Wizard	N/A	1/1	Yes	No	No	Yes	N/A	128	N/A	MIDI song select and start/stop; up to 8 program changes on 8 MIDI channels w/1 switch; 8 CCs	\$199.99
Steinberg	Micro MIDI Interface	Mac	1/1	No	No	No	No	N/A	N/A	N/A	Portable; no power supply required	\$49

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# SYNCHRONIZERS

Manufacturer	Product	SMPTE	Jam Sync	Freewheeling	MTC/MMC	Special Features	Price
Aardvark	AardSync II	N/A	No	No	N/A	Low jitter word clock/superclock sync gen; eliminates clicks/pops; locks to video sync; optional generation of PAL/NTSC block burst; all sample rates	\$1,795
Aardvark	Sync DA/Word Clock Distribution Amp	N/A	No	No	No/No	Generates word clock from AES/EBU; 5 word clock outputs; supports Digidesign 256 Superclock	\$795
Aardvark	TimeSync II	Input	Yes	Yes	Yes/Yes	Derives ultra-low jitter word clock/Superclock and MTC from LTC/VITC in; locks in 4 frames	\$1,295
Alesis	BRC Master	24, 25, 29.97, 29.97d, 30, 30d	No	Yes	Yes/Yes	Connects direct to ADAT, video in; word-clock I/O	\$1,499
Audio Engineering Associates	CB Electronics MC-1	All	Yes	Yes	No/No	Series 9-pin/parallel control for simultaneous control of 35 mm film dubbers (bi-phase) and time-card driver DAWs, etc.	\$7,945
Digidesign	SMPTE Slave Driver (SSD)	LTC, all rates	No	No	Yes/No	Resolves sample clock to free-run LTC; generates SMPTE (LTC); 44.1-48 kHz; with pull-up/down; low-jitter Apogee clock	\$1,295
Digidesign	Universal Slave Driver (USD)	LTC, VITC; biphas, pilot tone	Yes	Yes	Yes/No	Near sample-accurate lock; pull-up/down; window burn	\$2,095
Digidesign	Video Slave Drive (VSD)	VITC	No	No	No/No	NTSC or PAL; resolves sample clock to video black	\$995
Independent Audio	Motionworks R2P2	Remote control	Yes	Yes	Yes/Yes	Controls over 200 machines w/Sony 9-pin serial controls	\$1,125
JLCooper	dataSunc2	All	No	No	Yes/Yes	Controls to ADAT; MTC/SMPTE/MIDI clock with song position pointer	\$299.95
JLCooper	MMC/9 Pin	All	Yes	Yes	Yes/Yes	Controls 9-pin compressor video tap receives from MMC compatible computer-based sequencers/digital editing systems	\$499.95
JLCooper	PPS-2	All	Yes	Yes	Yes/No	Reads/generates SMPTE timecode and converts SMPTE to MTC or DTL; PPS-2 plus option allows MTC to LTC conversion (\$49.95); software for Mac, Win, Atari available	\$169.95
Mark of the Unicorn	Digital Timepiece	LTC, VITC, MTC; 24, 25, 29.97, 29.97d, 30, 30d	Yes	Yes	Yes/Yes	Reads/generates all standard forms of word clock and timecode, Sony 9-pin MC, video, ADAT, DA-88, S/PDIF sync; supports Digidesign Superclock for ProTools; 0.1% pull-up/down sample rates (44.1/48 kHz)	\$995
Mark of the Unicorn	MIDI Timepiece AV	LTC and MTC, all rates	Yes	Yes	Yes/Yes	Compatible networkable MIDI interface; syncs ADAT to SMPTE, MTC, video w/o BRC, word-clock out; slaves Pro Tools to SMPTE, MTC, video; supports MMC	\$595
Midiman	Syncman	24, 25, 30, 30d	Yes	No	Yes/No	Syncs sequencers, drum machines, MIDI lighting controllers to tape or video	\$199.95
Opcode	Studio 64XTC	All	Yes	Yes	Yes/Yes	ADAT sync; simultaneous word-clock and Superclock out; video/black burst ref; reads/writes SMPTE; converts SMPTE to MTC; rates MMC/MTC; optional Sony 9-pin sync expandable; full OMS supports	\$495
Steinberg	ACI ADAT	N/A	No	No	Yes/Yes	Sync computer to ADAT w/o audio track	\$399
TASCAM	ES-60	All	Yes	Yes	No/No		\$1,499
TimeLine	Lynx-2	24, 25, 29.97, 29.97d, 30, 30d	Yes	Yes	Yes/No	Cross-frame sync; film-card option	\$2,995
TimeLine	Microlynx	24, 25, 29.97, 29.97d, 30, 30d	Yes	Yes	Yes/No	Audio clock-generator optional card generates Superclock for sync to Pro Tools; VITC-reader card available; includes two-machine synchronizer and keyboard controller	\$2,995

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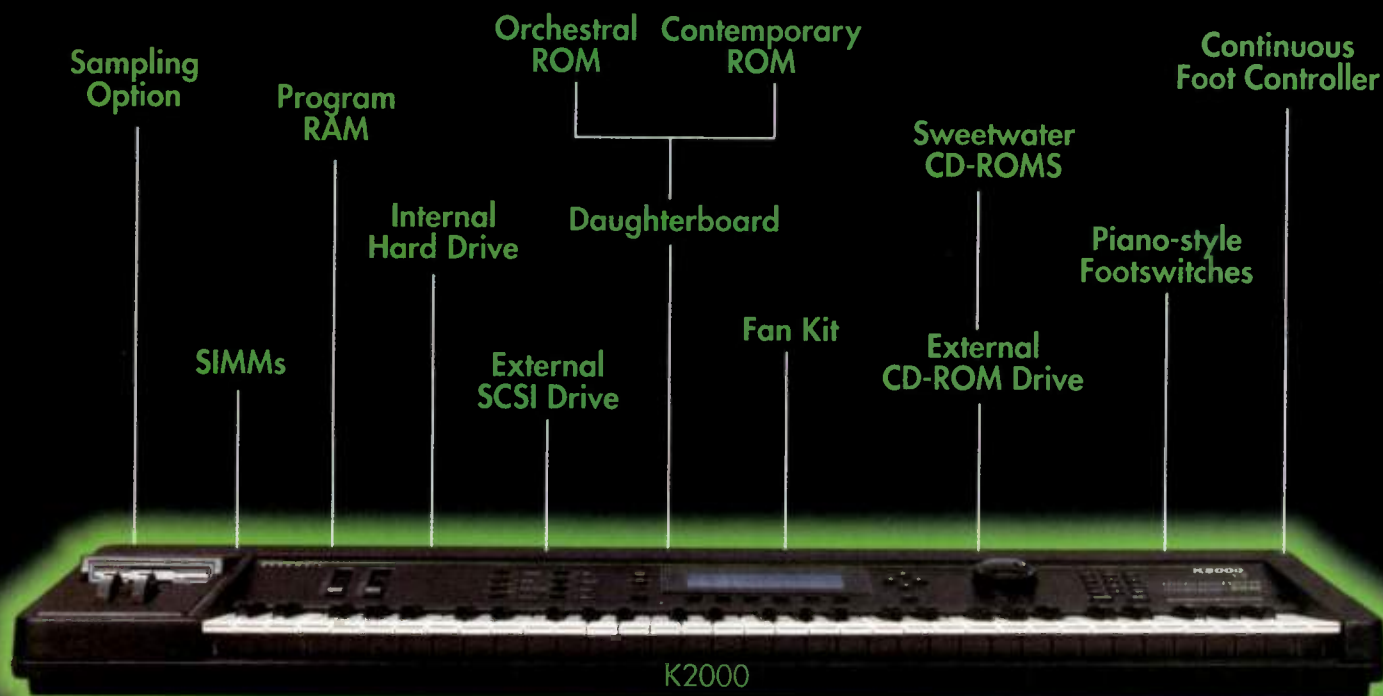
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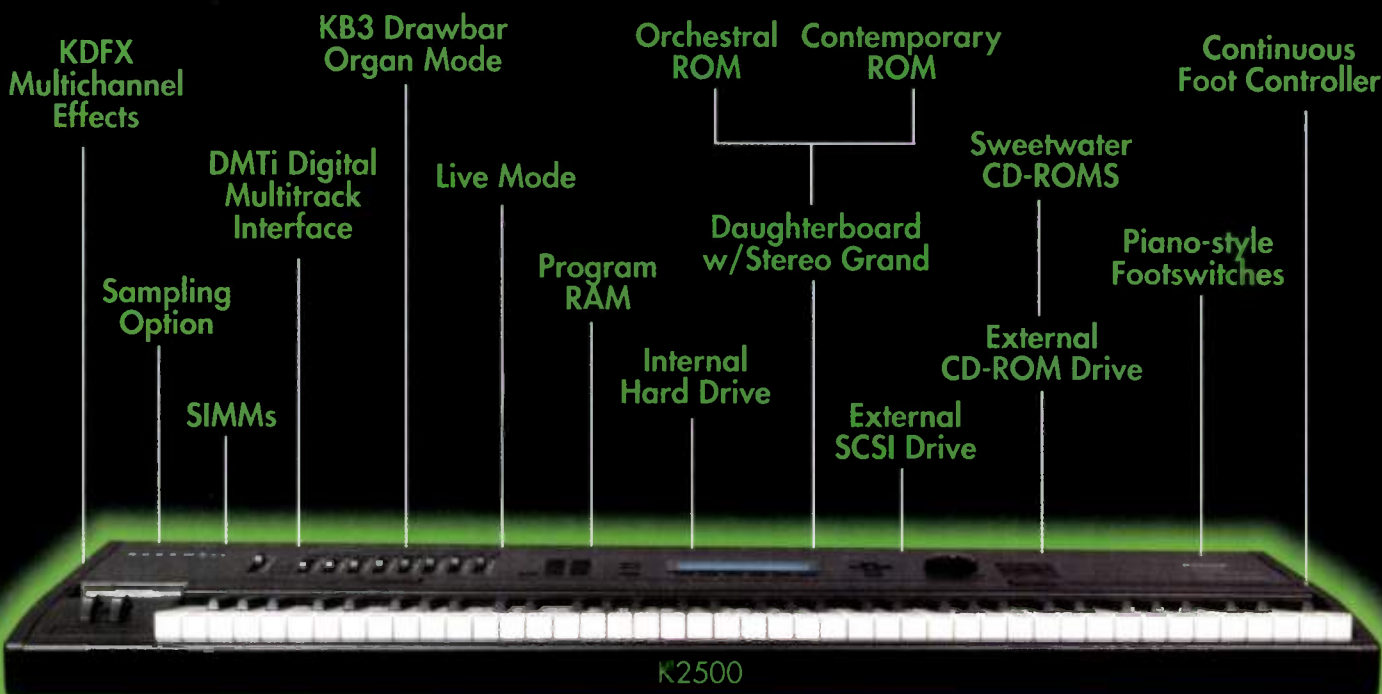
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# 4

## Electronic Musical Instruments & Microphones

For the purposes of this guide, the term *electronic musical instruments* refers to synthesizers, samplers, and drum machines.

We have provided separate charts for Keyboard Synths/Samplers and Synth/Sampler Modules. These devices offer so many features that we despaired of describing them all—fortunately, the tables cover a lot of territory and are easy to understand. The main difference between the two charts is, of course, the keyboard-specific features, such as the number of keys and physical controllers. We list synthesizers together, whether or not they come with onboard sequencers.

Microphones are essential at the beginning of your recording chain, so making good mic choices is critical. The most obvious differences are in basic type: condensers tend to be highly sensitive, dynamic models can usually take more punishment, and ribbon mics (which appear to be making a comeback) are in a class by themselves. Most of the specifications are important, but we think you should pay special attention to polar patterns and suggested applications. The polar-pattern specs indicate a mic's approximate pickup attributes, which determine what is captured and what is rejected. The suggested applications give you a good general idea of the manufacturer's intent.

Drum machines seem to be a fast-disappearing breed; we know of only five companies that still make them for the U.S. market. It's difficult to evaluate these products using a table because the most important question is whether you like the sounds a model produces. Nevertheless, we note such details as a unit's onboard effects, number of onboard sounds, and any special features. (Note that the Akai MPC2000 has no onboard sounds because it is a sampling drum machine. The number of sounds you can load into its memory depends on the amount of RAM installed and the size of the samples.) One other spec worth checking is the number of MIDI ports a model provides: the MPC2000 has two sets of MIDI I/O ports and can support up to 32 MIDI channels; in contrast, the Zoom machines come with only one MIDI In port and no MIDI Out.

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→	
→	146 Keyboard Synthesizers & Samplers
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## audix cx-series

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# KEYBOARD SYNTHESIZERS & SAMPLERS

Manufacturer	Product	Polyphony/ Multitimbral Parts	Waveform Memory ROM/RAM	Filter Types/ Resonance	Single Programs ROM/RAM	Multitimbral Performances ROM/RAM	Portamento	GM/GS/XG Compatible	Built-In Computer Interface/Type	Disk Drive Type	Number of Keys	# of Keyboard Zones (max)	Left-Hand Controllers
Alesis	QS6.1	64/16	16/16 MB (w/flash cards)	LP/Yes	512/128	400/100	Yes	GM	Yes/serial	N/A	61 (semi-weighted)	16	Pitch; modular; 4 sliders
Alesis	QS7.1	64/16	16/16 MB (w/flash cards)	LP/Yes	512/128	400/100	Yes	GM	Yes/serial	N/A	76 (semi-weighted)	16	Pitch; modular; 4 sliders
Alesis	QS8.1	64/16	16/16 MB (w/flash cards)	LP/Yes	512/128	400/100	Yes	GM	Yes/serial	N/A	88 (weighted)	16	Pitch; modular; 4 sliders
E-mu Systems	E-Synth	64 (exp to 128)/16 (exp to 32)	16 MB (exp to 64)/16 MB (exp to 128)	20 Types/ Yes	Yes	0/1	Yes	N/A	Yes/SCSI	Floppy	76 (semi-weighted)	0	Pitch; modular; thumb button
E-mu Systems	ESI 4000 Turbo Keyboard	128/16	128/128 MB	20 Types/ Yes	1,000/1,000	0/1	Yes	N/A	Yes/SCSI	SCSI; internal floppy; SCSI port	76	76	Pitch; modular; thumb button
Ensoniq	Ensoniq Avista	32/16	8 MB	N/A	128/No	16/0	No	GM; GS; XG	No	1.4 MB floppy	76	1	0
Ensoniq	Ensoniq Fizmo	45/16	4 MB	N/A	64/128	1	Yes	N/A	No	N/A	61	4	Pitch; modular
Ensoniq	ZR-76	64/16	30/4 MB	LP/No	468/256	32/0	Yes	GM	No	1.4 MB floppy	76	3	Pitch; modular
Generalmusic	Equinox 61, 76, and Pro88	64/16	16/40 MB	HP; LP; BP/Yes	1,200/ 12,000	112+16 drawbar	Yes	GM; GS	Yes/serial and SCSI (std on Pro Version)	Internal HD floppy (standard on Powerstation)	61; 76; 88	16	Pitch; modular
Generalmusic	SK 760 and 880 World Keyboards	64/32	16/40 MB	HP; LP; BP/Yes	1,000/1,000	64/0	Yes	GM; GS	Yes/serial; SCSI (optional)	Internal HD floppy (standard on Powerstation)	76, 88	32	Pitch; modular
Korg	N1	64/32	18/0 MB	Resonant filter effect algorithm	1,196/100	302/100	Yes	GM; GS; XG	Yes/serial PC or Mac	N/A	88 (weighted)	32	Pitch; modular; 4 knobs
Korg	N264	64/16	8/0 MB	N/A	336/200	200/200	No	GM	No	3.5" HD/DD floppy	76	16	X/Y joystick
Korg	N364	64/16	8/0 MB	N/A	336/200	200/200	No	GM	No	3.5" HD/DD floppy	61	16	X/Y joystick
Korg	N5EX	64/32	18/0 MB	Resonant filter effect algorithm	1,196/100	302/100	Yes	GM; GS; XG	Yes/serial PC or Mac	N/A	61	32	Pitch; modular; 4 knobs
Korg	SG Pro X	64/1	24 MB	N/A	0/64	0/64	No	N/A	No	N/A	88 (weighted)	10	Pitch; modular; 5-band EQ; 4 sliders; 6 switches
Korg	Trinity	32/16	24/0 MB	HP; LP; BP; band reject/No	0/256	0/256	No	N/A	No	3.5" HD/DD floppy	61	16	Ribbon; X/Y joystick; 2 switches; slider
Korg	Trinity V3	38/16	24/0 MB	HP; LP; BP; band reject/No	0/320	0/256	Yes	N/A	No	3.5" HD/DD floppy	61	16	Ribbon; X/Y joystick; 2 switches; slider
Korg	Trinity V3 Pro	38/16	24/0 MB	HP; LP; BP; band reject/No	0/320	0/256	Yes	N/A	No	3.5" HD/DD floppy	76	16	Ribbon; X/Y joystick; 2 switches; slider
Korg	Trinity V3 Pro X	38/16	24/0 MB	HP; LP; BP; band reject/No	0/320	0/256	Yes	N/A	No	3.5" HD/DD floppy	88 (weighted)	16	Ribbon; X/Y joystick; (2) switches; slider
Korg	Z1	12/6	N/A	HP; LP; BP; dual BP; band reject/No	0/256	0/32	Yes	N/A	No	N/A	61	6	Pitch; modular; 4-pole ribbon 2 switches; knobs for each oscillator

Aftertouch (Poly/Channel)	# and Type of Controller Inputs	# of Sequencer Tracks/ppqn	Sequencer Memory (Notes)	Types of Quantization	Arpeggiator	# of Effects Processors/ Effects Programs	# and Type of Audio Outputs	Special Features	Options	Price
Yes/No	1 sustain; 2 assign	16 (from flash card)	N/A	N/A	No	1/8	(2) 1/4"	CD-ROM; usr smpls/sqncs w/flash cards	Ocards; PCMCIA flash cards	\$1,099
Yes/No	1 sustain; assign	16 (from flash card)	N/A	N/A	No	1/8	(4) 1/4"	CD-ROM; usr smpls/sqncs w/flash cards; dgitl out	Ocards; PCMCIA flash cards	\$1,399
Yes/No	1 sustain; 2 assign	16 (from flash card)	N/A	N/A	No	1/8	(4) 1/4"	CD-ROM; usr smpls/sqncs w/flash cards; dgitl out	Ocards; PCMCIA flash cards	\$1,999
No/Yes	2 pedal	48 (+ rack)/480	100,000+	Input; output; swing	Yes	2	(8) analog, (2) S/PDIF	DMS digital modular synthesis; E4 Sampler compat	ADAT interface; hard drive; polyphony upgrade; MIDI expander	\$3,395
Yes/Yes	2 pedal	48/480	100,000+	Input; output; swing	Yes	2	(8) analog; (16) ADAT (optional)	E4 emulator sampler w/DMS	ADAT I/O card; MIDI expander card; sound ROMS	\$5,195
No/No	1 sustain	2	25,000	N/A	No	1/2	2 (+ 2 headphone)	Built-in speakers; bench; music rack		\$929.99
No/No	0	0/0	N/A	N/A	Yes	5/41	2 (+ headphone)	Fizmo knobs to control transwaves	23 knobs	\$1,495
Yes/Yes	5/volume pedal, footswitches	16/384	231 KB	64th triplet to whole note; 11 different styles	Yes	6/40	(6) main L&R; aux L&R; headphone	Idea pad; drum machine	Sound cards; flash memory	\$2,795
Yes/Yes	4/volume pedal, footswitches	16/192	250,000	96th + 5-1/8 groove and 5-1/16 groove	Yes	2/85	(4) 1/4"	Sample translator; groove machine; tonewheel organ w/drawbars; 8 prog MIDI ldrs/switchs	Pro upgrade incl 8 MB BBU mem; 1.2 GB HD; SCSI; Pro2 piano smpls (strd on Equinox Pro88)	(61) \$1,995 (76) \$2,195 (Pro88) \$3,695
Yes/Yes	4/volume pedal, footswitches	32/192	250,000	96th + 5-1/8 groove and 5-1/16 groove	No	4/56	(4) 1/4"	224 styles (192 ROM/32 user) x 4; smpl trnsltr; groove machine; tonewheel organ w/drawbars	Powerstation vers/upgd incl 1.2 GB HD, complete Generalmusic style/sound librs; 200+ strd/pop/ rock tunes; 1,000 MIDI files	(SK760) \$2,495; (SK760RS) \$2,995; (SK880) \$2,995; (SK880PS) \$3,495
No/Yes	2 pedal; switch	0/0	N/A	N/A	Yes	2/48	(4) 1/4"; headphone	4 real-time knobs; layer/split buttons		\$2,099
No/Yes	2 pedal/switch; damper	16/96	32,000	Hi; 32nd; 16th; 8th; 4th; triplet	Yes	2/47	(4) 1/4"; headphone	RPPR-plays patterns back on keys		\$2,400
No/Yes	2 pedal/switch; damper	16/96	32,000	Hi; 32nd; 16th; 8th; 4th; triplet	Yes	2/47	(4) 1/4"; headphone	RPPR-plays patterns back on keys		\$1,900
No/Yes	2 pedal; switch	0/0	N/A	N/A	Yes	2/48	(4) 1/4"; headphone	4 real-time knobs; layer/split buttons		\$1,099
No/Yes	3 pedal; switch; damper	0/0	N/A	N/A	No	2/12	(2) 1/4"; headphone	15 MB of piano samples; controls up to 8 ext modules		\$2,600
No/Yes	3 pedal; switch; damper	16/192	80,000	Hi; 32nd; 16th; 8th; 4th; triplet	No	10/14	(4) 1/4"; headphone	Touch-sens screen; 4 outs	Digital aud intric w/SCSI; ADAT optcl out; 8 MB flash ROM for smpl plybck; DSP anlg upgrd brd	\$2,800
No/Yes	3 pedal; switch; damper	16/192	80,000	Hi; 32nd; 16th; 8th; 4th; triplet	No	10/14	(4) 1/4"; headphone	Touch-sens screen; 4 outs	Digital aud intric w/SCSI; ADAT optcl out; 8 MB flash ROM for smpl plybck; DSP anlg upgrd brd	\$3,550
No/Yes	3 pedal; switch; damper	16/192	80,000	Hi; 32nd; 16th; 8th; 4th; triplet	No	10/14	(4) 1/4"; headphone	Touch-sens screen; 4 outs	Digital aud intric w/SCSI; ADAT optcl out; 8 MB flash ROM for smpl plybck	\$4,350
No/Yes	3 pedal; switch; damper	16/192	80,000	Hi; 32nd; 16th; 8th; 4th; triplet	No	10/14	(4) 1/4"; headphone	Touch-sens screen; 4 outs	Digital aud intric w/SCSI; ADAT optcl out; 8 MB flash ROM for smpl plybck; 540 MB intrnl hard disk	\$5,200
No/Yes	4 pedal; switch; damper; volume	0/0	N/A	N/A	Yes	3/3	(2) 1/4"; headphone	PCM/CIA slot stores 4000+ programs	DITRI-ADAT optical output; DSPBZ1 6-voice expansion board	\$2,600



# KEYBOARD SYNTHESIZERS & SAMPLERS

Manufacturer	Product	Polyphony/ Multitimbral Parts	Waveform Memory ROM/RAM	Filter Types/ Resonance	Single Programs ROM/RAM	Multitimbral Performances ROM/RAM	Portamento	GM/GS/XG Compatible	Built-In Computer Interface/Type	Disk Drive Type	Number of Keys	# of Keyboard Zones (max)	Left-Hand Controllers
Korg	Z1EX	18/6	N/A	HP, LP; BP; dual BP band reject	0/256	0/32	Yes	N/A	No	N/A	61	6	Pitch; mod; 4-pole ribbon 2 switches; knobs for each oscillator
Kurzweil	K2000VP	24 (smp/ playback); 96 (oscillator)/16	24 MB (exp to 64)	Various/Yes	200/0	100 preset setups	Yes	GM w/GM compatible file	No	Floppy (SCSI optional)	16	3	Pitch; modular; slider
Kurzweil	K2500 AES (Audio Elite System)	48 (sample playback); 192 (oscillator)/16	28/128 MB sample RAM; 125 MB PRAM	LP; HP; BP; notch; AP/Yes	450/1,000	200/1,000	Yes	GM w/GM conversion disk	Y/SCSI (2)	Floppy; internal 2 gig HD	88	8	Pitch; modular; small ribbon; large ribbon; 2 push buttons; 8 sliders
Kurzweil	K2500; K2500S; K2500X; K2500XS	48 (sample playback); 192 (oscillator)/16	8 MB RAM (exp to 128)	LP; HP; BP; notch; AP/Yes	200/1,000	100/1,000	Yes	GM w/GM conversion disk	Y/SCSI (2)	Floppy	76 (K2500/ K2500S); 88 (K2500X/ K2500XS)	8	Pitch; mod; small ribbon; large ribbon; 2 push buttons; 8 sliders
Kurzweil	K2VX/S	24 (sample playback); 96 (oscillator)/16	24 MB SIMMS (exp to 64)	Various/ Yes	600/0	300 preset setups	Yes	GM w/GM compatible file	No	Floppy (SCSI optional)	61	3	Pitch; mod; slider
Kurzweil	PC88	32/16	6/0 MB	N/A	64/0	32/128	No	N/A	No	N/A	88	4	Pitch; mod; 3 push buttons; 4 sliders
Kurzweil	PC88MX	64/16	12/0 MB	N/A	269/0	64/128	No	GM; GS; XG	No	N/A	88	4	Pitch; mod; 3 push buttons; 4 sliders
Nord	Nord Lead 2	16/4	N/A	LP; HP; notch; comb/Yes	59/40	100	Yes	N/A	No	N/A	49	2	Pitch; mod
Nord	Nord Modular	16/4	N/A	11 types/ Yes	0/100	0/0	Yes	N/A	No	N/A	24	2	
Roland	JP-8000	8/2	7 modeled	LP; BP; HP/Yes	128/128	64/64	Yes	N/A	No	N/A	49	0	Pitch; mod (lever); ribbon
Roland	JX-305	64/24	12 MB	LP; BP; HP; peaking/ Yes	640/128	768/256	Yes	N/A	No	SmartMedia card song storage	61	0	Pitch; mod (lever)
Roland	VK-7	Full/4	93 modeled tonewheels/4 MB orchstrl snds	N/A	64/16	0/0	No	N/A	No	N/A	61	0	9 drawbars; rotary speed; brake; bypass; drawbar select
Roland	XP-10	28/16	8 MB	LP/Yes	338/256	64/32	Yes	GM; GS	No	N/A	61	0	Pitch; mod (lever)
Roland	XP-30	64/16	32 (exp to 48 MB)	LP; BP; HP; peaking/ Yes	1,534/128	64/32	Yes	GM	No	N/A	61	0	Pitch; mod (lever)
Roland	XP-60	64/16	8 (exp to 40 MB)	LP; BP; HP; peaking/Yes	512/128	64/32	Yes	GM	No	3.5" floppy	61	0	Pitch; mod; 2 sliders
Roland	XP-80	64/16	8 (exp to 40 MB)	LP; BP; HP; peaking/Yes	512/128	64/32	Yes	GM	No	3.5" floppy	61	0	Pitch; mod (lever); 2 sliders

Aftertouch (Poly/Channel)	# and Type of Controller Inputs	# of Sequencer Tracks/ppqn	Sequencer Memory (Notes)	Types of Quantization	Arpeggiator	# of Effects Processors/ Effects Programs	# and Type of Audio Outputs	Special Features	Options	Price
o/Yes	4 pedal; switch; damper, volume	0/0		N/A	Yes	3/3	(2) 1/4", headphone	Arpeggiator; PCM/CIA slot stores 4000+ progs	ADAT optical output	\$3,100
No/No	3/pedal; footswitches	32 (16 signal +16 arrange)	30,000 (exp to 190,000)	Groove; reference; swing; shift	No	1/37	(4) 1/4"; AES/EBU (w/sampling option)	Vast synthesis; rds smpl lbrs frm Akai, Roland, Ensoniq; SCSI port; trigger sng stps frm keys in real time; incl 30-disk anlg classic lbr	64 MB RAM; 24 MB ROM; hrd drive; sampling	\$1,995
Transmits both/ receives poly	7/pedals; footswitches; breath	32/768	156,000	Groove; reference; swing; shift	Yes	6/431 (inc KDFX)	(4) 1/4"; AES/EBU; optical; KDS	Vast synthesis; rds smpl lbrs frm Akai, Roland, Ensoniq, AIFF, Wave; trigger sng stps frm keys in real time; real-time resampling; "KB3"-drwbr emulations	Ships with all options	\$20,000
Transmits both/ receives poly	7/pedals; footswitches; breath	32/768	30,000 (exp to 156,000)	Groove; reference; swing; shift	Yes	1/37	(8) 1/4"; AES/EBU; optical; KDS	Vast synthesis; rds smpl lbrs frm Akai, Roland, Ensoniq, AIFF, Wave; trigger sng stps frm keys in real time; real-time resampling; "KB3"-drwbr emulations; KDFX	128 MB smpl RAM; 28 MB smpl ROM; KDFX; hard drive; sampling	(K2500) \$5,556; (K2500S) \$6,440; (K2500X) \$6,120; (K2500XS) \$7,000
Transmits chan/ receives both	3/pedal; footswitches	32 (16 signal, +16 arrange)	190,000	Groove; reference; swing; shift	No	1/37	(4) 1/4"; AES/EBU (w/sampling option)	Vast synthesis; rds smpl lbrs frm Akai, Roland, Ensoniq; SCSI port; trigger sng stps frm keys in real time	64 MB RAM; 24 MB ROM; hard drive; sampling	\$1,995
No/Yes	6/pedals; footswitches	0/0	N/A	N/A	Yes	1/40	(2) 1/4"		VGM board; music rack	\$2,650
No/Yes	6/pedals; footswitches	0/0	N/A	N/A	Yes	2/80	(2) 1/4"		Music rack	\$3,150
No/No	2 pedal	0/0	N/A	N/A	Yes	N/A	(4) 1/4"	Analog modeling synth; 26 knobs, 28 buttons	PMC CIA cards w/ or w/o sounds	\$1,795
No/No	2 pedal	Optional/480	Infinite	N/A	Yes	4/15	(4) 1/4"	Builds synths frm scratch using over 110 synth bldng blcks w/sltwr	Exp up to 32 voices	\$2,795
No/ribbon sends channel	2 pedal (assign/hold)	0/0	23,000	Grid	Yes	3/18	Stereo L/R; headphone	38 knobs and sliders; new waveforms; recordable motion cntrls	DP-2/6 damper ped; EV-5 expr ped	\$1,695
Sends channel/ receives both	4/pedals (assign/ hold); footswitches	8/96	50,000	Grid; shuffle; groove	Yes	3/24	Stereo L/R; headphone	8 real-time knobs; 60 RPS sets; dance FX slicer; lo-fi, phonograph	DP-2/6 damper ped; EV-5/7 expr ped	\$1,495
No/No	3/pedals (assign/ hold)	0/0	N/A	N/A	No	1/4	Stereo L/R; headphone; 11-pin rotary cab	Bal outs; 2nd manual w/any MIDI kybrd; prog key click; prog pickup leakage; vint/cln tonewheel models	DP-2/6 damper ped; EV-5/7 expr ped; PK-5/7 MIDI peds	\$2,495
Receives both	2 pedal (assign/hold)	0/0	N/A	Arpegg; groove; shuffle	Yes	2/16	Stereo L/R x2; headphones	Combination palette sliders	DP-2/6 damper ped; EV-5 expr ped	\$895
Sends channel/ receives both	2 pedal (assign/hold)	0/0	N/A	N/A	Yes	3/40	Stereo L/R x2; headphones	2 exp slots; patch finder; prog sound palette sliders; sync exp; beatloops to MIDI	SR-JV80-series exp brds; SM-4 SmartMedia card; EV-5 expr ped; DP-2/6 damper ped	\$1,395
Sends channel/ receives both	5 pedal (assign/hold)	16/96	60,000	Grid; groove; shuffle	Yes	3/40	Stereo L/R x2; headphones; click out	4 exp slots; sound palette; disk quickplay; sync exp; beatloops to MIDI	SR-JV80 exp brds; DP-2/6 damper ped; EV-5 expr ped	\$1,995
Sends channel/ receives both	5 pedal (assign/hold)	16/96	60,000	Grid; groove; shuffle	Yes	3/40	Stereo L/R x2 headphones; click out	4 exp slots; sound palette; disk quickplay; sync exp; beatloops to MIDI	SR-JV80 exp brds; DP-2/6 damper ped; EV-5 expr ped	\$2,495



# SYNTHESIZER & SAMPLER MODULES

Manufacturer	Product	Polyphony/ Multitimbral Parts	Waveform Memory ROM/RAM	Filter Types/ Resonance	Single Programs ROM/RAM	Multitimbral Performances ROM/RAM	Portamento	GM/GS/XG Compatible	Built-In Computer Interface/Type	Disk Drive Type	# and Type of Controller Inputs
Akai	MPC2000 MIDI Production Center	32/1	0 (exp to 16 MB)/32 MB	LP/Yes	0/24	0/0	No	N/A	Yes/SCSI	200/2 HD floppy	0
Akai	S20 Stereo Phrase Sampler	8/16	17 MB	N/A	0/16	0/16	No	N/A	No	200/2 HD floppy	0
Akai	S2000 MIDI Stereo Digital Sampler	32/16	0 (exp to 32 MB)/32 MB	LP (exp to BP; HP, LP)/Yes	0/255	0/1	Yes	N/A	Yes/SCSI	200/2 HD floppy	0
Akai	S3000XL MIDI Stereo Digital Sampler	32/16	0 (exp to 32 MB)/32 MB	LP (exp to LP; BP, HP)/Yes	0/255	0/1	Yes	N/A	Yes/SCSI	200/2 HD floppy	0
Akai	S5000 MIDI Stereo Digital Sampler	64 (exp to 128)/32	0/256 MB	26 types/Yes	0/0	0/0	No	N/A	Yes/SCSI 2x2	200/2 HD floppy	0
Akai	S6000 MIDI Stereo Digital Sampler	64 (exp to 128)/32	0/256 MB	26 types/Yes	0/0	0/128	No	N/A	Yes/SCSI-2x2	200/2 HD floppy	0
Alesis	DM Pro	64/16	16/8 MB (w/flash cards)	LP/No	1,536/128	0/64	Yes	GM	No	N/A	1 pedal
Alesis	DMS Drum Module	16/1	4 MB	LP/No	0/20	0/0	No	GM; GS; XG	No	N/A	0
Alesis	NanoBass	64/1	4 MB	LP/No	256/0	0/0	Yes	N/A	No	N/A	0
Alesis	NanoPiano	64/1	8 MB	LP/No	256/0	0/0	Yes	N/A	No	N/A	0
Alesis	NanoSynth	64/16	8 MB	LP/No	512/128	0/1	Yes	GM; GS; XG	Yes/serial	N/A	0
Alesis	QSR Synth Module	64/16	16/16 MB (add'l w/flash RAM)	LP/No	512/128	400/100	Yes	GM; GS; XG	Yes/serial	N/A	0
E-mu Systems	Audity 2000	64/16	16 MB (exp to 32 MB)	50 types, 17 6-pole/Yes	640/512	16	Yes	N/A	No	Floppy	0
E-mu Systems	E4XT Ultra	128/32	64/16 MB (exp to 128 MB)	21 types, 6-pole/Yes	1,000/1,000	1	Yes	N/A	Yes/SCSI	Floppy	0
E-mu Systems	EG400 Ultra	64 (exp to 128)/16 (exp to 32)	64/16 MB (exp to 128 MB)	21 types, 6-pole/Yes	1,000/1,000	1	Yes	N/A	Yes/SCSI	Floppy	0
E-mu Systems	ESI 4000 Turbo Zip	64/16	128/0 (exp to 12 MB)	21 types, 6-pole/Yes	0/256	1	Yes	GM; GS; XG	Yes/SCSI	Zip	0
E-mu Systems	ESI-4000	64/16	128/0 (exp to 128 MB)	21 types, 6-pole/Yes	0/256	1	Yes	N/A	Yes/SCSI	Floppy	0
E-mu Systems	Esynth Ultra	64 (exp 128)/ 16 exp to 32	16 MB (exp to 64 MB)/16 MB (exp to 128 MB)	21 types, 6-pole/Yes	1,000/1,000	1	Yes	N/A	Yes/SCSI	Floppy	0
E-mu Systems	Orbit V2	32/16	8/0 MB	17 types/Yes	384/256	0/0	Yes	N/A	No	N/A	0
E-mu Systems	Planet Phatt	32/16	8/0 MB	17 types/Yes	384/256	0/0	Yes	N/A	No	N/A	0
E-mu Systems	Proteus 2000	128/32	23 MB (exp to 128 MB)	17 types/Yes	1,024/512	0/128	Yes	N/A	No	N/A	0
Ensoniq	ASR-X Pro	32/16	2/2 MB (exp to 66 MB)	LP; HP; BP/Yes	0/0	1	Yes	N/A	Yes/SCSI	Floppy	2

# of Sequencer Tracks/ppqn	Sequencer Memory	Types of Quantization	Arpeggiator	# of Effects Processors/ Effects	# of Audio Outputs/Type	Special Features	Options	Price
64/96	100,000 notes	8th; 8th triplet; 16+ w/swing; 16th triplet; 32nd; 32nd triplet	No	0 (exp to 4)/0 (exp to 50 presets)	2 (exp to 10)/ 1/4"	Reads S1000; S3000; WAV files; velocity and pressure sensitive pads; automated mixing	8 output exp; Sample Verb FX; SMPTE board; 8 MB flash ROM	\$1,599
N/A	N/A	N/A	No	0/0	2/RCA	Loop function	Supports S1000; S3000; XL-Series sounds	\$649
N/A	N/A	N/A	No	0 (exp to 4)/ 0 (exp to 50 presets)	2 (exp)/ 1/4"	MESA editing software (Mac/PC); SMF player	Multi-8/D output expander; Profilter exp; SampleVerb FX; 8 MB flash ROM board	\$899
N/A	N/A	N/A	No	0 (exp to 4)/0 (exp to 50 presets)	10/ 1/4" (and RCA digital)	Dir-to-disk rec; MESA computer software (Mac/PC); SMF player	SampleVerb FX; 8 MB flash ROM board; Profilter	\$1,499
N/A	N/A	N/A	Yes	0 (exp to 4)/0 (exp to 50)	8 (exp to 16)/ 1/4"	FAT16/32 native discs; word clock; WAV native sample format; folder-based disk management	8 output expander; 64 voice exp; SampleVerb II FX; 8in/16out ADAT optical I/O	\$2,499 (S5000 Studio) \$3,499
N/A	N/A	N/A	Yes	0 (exp to 4)/0 (exp to 50)	2/XLR; 16/ 1/4"	Remote front control panel; FAT16/32 native discs; WAV native sample format	64-voice expander; SampleVerb II FX; 8in/16out ADAT optical I/O	\$3,499 (S6000 Studio) \$4,499
16 (playback)/ 480	Up to 8 MB (w/flash card)	N/A	No	1/5	6/ 1/4" TRS	16 trigger ins; 2 RCA ins		\$899
N/A	N/A	N/A	No	N/A	4/ 1/4"			\$449
N/A	N/A	N/A	No	1/8	2/ 1/4"			\$299
N/A	N/A	N/A	No	1/8	2/ 1/4"			\$399
N/A	N/A	N/A	No	1/8	2/ RCA	CD-ROM	RCA Audio inputs	\$449
16 (w/flash card)/480	Up to 8 MB (w/flash card)	N/A	No	1/8	4/ 1/4"	Add sequences/samples via flash RAM; digital outs; CD-ROM		\$899
N/A	N/A	N/A	Yes	2/60	6 (stereo); S/PDIF	Digital rhythmic modular synthesis; over 100 bpm	Downloads OS via Internet; second ROM set (Audity Extreme)	\$2,149
48/480	4 MB (hundreds of thousands)	1/4 to 1/64, w/swing	No	2/60	8 (+8 opt)/ 16 ADAT out	Digital modular synthesis; resampling	RFX-32 (32-bit FX); flash ROM board; ADAT I/O; analog out expander	\$3,595
48/480	4 MB (hundreds of thousands)	1/4 to 1/64, w/swing	No	2/60	8 (+8 opt)/ 16 ADAT out	Digital modular synthesis; resampling	MIDI x2 expander; digital I/O; ASCII; R-FX32 (32-bit FX); ROM board; ADAT I/O; analog out expander	\$2,295
N/A	N/A	N/A	No	2/60	8 -1/4"; S/PDIF	100 MB Zip drive; effects; 10 outs		\$2,149
N/A	N/A	N/A	No	Optional	4 (exp to 8)/ 1/4"	Trigger mode; SCSI	Turbo option kit adds output and effects	\$1,449
48/480	4 MB (hundreds of thousands)	1/4 to 1/64, w/swing	No	2/60	8 (+8 opt) in/ 16 out ADAT	Digital modular synthesis; resampling	RFX-32 (32-bit FX); flash ROM board; ADAT I/O; analog out expander	\$2,895
N/A	N/A	N/A	No	N/A	6/ 1/4"	Beats mode		\$795
N/A	N/A	N/A	No	N/A	6/ 1/4"	Beats mode		\$795
N/A	N/A	N/A	No	2/30+	8/ 1/4"; 2 S/PDIF	Creates custom ROM sets using E4 Ultra samplers		\$995
16/384	70,000 (exp to 140,000)	Adjustable	No	2/40	Headphone			\$1,695



# SYNTHESIZER & SAMPLER MODULES

Manufacturer	Product	Polyphony/ Multitimbral Parts	Waveform Memory ROM/RAM	Filter Types/ Resonance	Single Programs ROM/RAM	Multitimbral Performances ROM/RAM	Portamento	GM/GS/XG Compatible	Built-in Computer Interface/Type	Disk Drive Type	# and Type of Controller Inputs
Fatar	Blue Chip Baby B Virtual Tonewheel Drawbar Module	24/3	All modeled	N/A	99/99	N/A	No	N/A	No	N/A	0
Fatar	Blue Chip DX-7 Virtual Tonewheel Drawbar Module	24/3	All modeled	N/A	99/99	N/A	No	N/A	No	N/A	0
Korg	N1R	64/32	18/0 MB	Reso Filter FX algorithm/Yes	1,471/200	32	Yes	GM; GS; XG	Yes/PCIF serial (PC and Mac)	N/A	0
Korg	NX5R	64-96/48	8/0 MB	N/A	1,645/200	0/4	No	GM; GS; XG	Yes/PCIF serial (PC and Mac)	N/A	0
Korg	SG Rack	64/1	24/0 MB	N/A	0/64	0/64	No	N/A	No	N/A	0
Korg	TR Rack	64/32	32/0 MB	HP; LP; BP; BR/No	512	0/513	No	N/A	Yes/PCIF serial (PC and Mac)	N/A	0
Kurzweil	K2000RVP	24 for sample playback, 96 total oscillators	24/24 MB (exp to 64 MB)	Various/Yes	200/0	100/0	Yes	GM; GS; XG (w/disk)	Yes/SCSI (2)	N/A	0
Kurzweil	K2500R; K2500RS	48 for sample playback, 192 total oscillators/ 16 parts	8 MB/ (RAM exp to 128 MB)	LP; HP; BP; notch; /AP/Yes	200/ 1,000	100/ 1,000	Yes	GM (w/disk)	Yes/SCSI (2)	Floppy	0
Kurzweil	Micropiano	32/0	6/0 MB	N/A	32/0	0/0	No	N/A	No	N/A	0
Nord	Nord Micro Modular	4/1	N/A	11 types/Yes	0/100	0/0	Yes	N/A	Yes/MIDI SysEx ports	N/A	0
Nord	Nord Modular Rack	16/4	N/A	11 types/Yes	0/100	0/0	Yes	N/A	Yes/MIDI SysEx ports	N/A	2 pedal
Nord	Nord Rack 2	16/4	N/A	LP; HP; notch; comb/Yes	59/40	100	Yes	N/A	No	N/A	2 pedal
Roland	JV-1080	64/16	8/exp to 40 MB	LP; BP; HP; peaking/Yes	512/128	64/32	Yes	GM	No	N/A	0
Roland	JV-2080	64/16	8/exp to 40 MB	LP; BP; HP; peaking/Yes	640/128	64/32	Yes	GM	No	N/A	0
Roland	JV-8080	10/2	7 modeled	LP; BP; HP; peaking/Yes	384/128	192/64	Yes	N/A	No	N/A	0
Roland	PMA-5	28/8 (16-part in GM mode)	8 MB	LP/Yes	306 (w/ Style)/200 (w/Style)	306/0	Yes	GM; GS	No	N/A	0
Roland	Roland GR-30 Guitar Synthesizer	28/1	384 tones (8 MB)/0	LP/No	128/128	0/0	No	N/A	No	N/A	2 bank select/ expression
Roland	SC-880	64/32	8/8 MB	LP/Yes	1,117/256	8/8	Yes	GM; GS	No	N/A	0

# of Sequencer Tracks/ppan	Sequencer Memory	Types of Quantization	Arpeggiator	# of Effects Processors/ Effects	# of Audio Outputs/Type	Special Features	Options	Price
N/A	N/A	N/A	N/A	1/6 reverb programs	2/ 1/4" (L/R)	Drawbars; Rotorsound simulations	VP-26 pedal/ PS-10 footswitch	\$895
N/A	N/A	N/A	N/A	1/6 reverb programs	2/ 1/4" (L/R)	Drawbars; Rotorsound simulations	VP-26 pedal; PS-10 footswitch	\$1,595
N/A	N/A	N/A	Yes	2/48	4/ 1/4"	4 assignable real-time control knobs	AG011 (PC); AG002 (Mac) serial cable/driver package (for 32 parts)	\$850
N/A	N/A	N/A	No	2/47	2/ 1/4"	XG daughterboard; 96-voice polyphony/48 parts	AG001 (PC); AG002 (Mac) serial interface cable and driver software	\$725
N/A	N/A	N/A	No	2/12	2/ 1/4"	15 MB of high quality piano sounds		\$899
N/A	N/A	N/A	Yes	10/114	4/ 1/4"	All Trinity sounds; + 8 MB; Sound Diver editor program	DITRI-ADAT digital interface	\$1,399
32 /768	30,000 notes (exp to 190,000)	Groove; reference; swing; shift	No	1/37	8/ 1/4"; AES/EBU; XLR (w/sampling options)	Reads samples from Akai, Roland, Ensoniq; SCSI port; 30 disk analog classic library	64 MB RAM; 24 MB ROM; hard drive; sampling	\$1,995
32/768	30,000 notes (exp to 156,000)	Groove; reference; swing; shift	Yes	1/37 (KDFX optional)	8/ 1/4"; AES/EBU; XLR; optical KDS	Reads samples from Akai, Roland, Ensoniq; AIFF, Wave; real-time resampling; KB3 drawbar emulation	128 MB sample RAM; 28 MB sample ROM; KDFX; hard drive; sampling	(K2500R) \$4,475 (K2500RS) \$5,250
N/A	N/A	N/A	No	1/16	2/ 1/4"	Can link 2 mics for 64-voice polyphony		\$550
4/480	Infinite	N/A	Yes	1/15	2/ 1/4"	Builds synths using 110 synth building blocks in software		\$899
Optional/480	Infinite	N/A	Yes	4/15	2/ 1/4"	Builds synths using 110 synth building blocks in software	Expansion up to 32 voices	\$2,495
N/A	N/A	N/A	Yes	N/A	4/ 1/4"	Analog modeling synth; 26 knobs and 28 buttons	PCMCIA cards for extra sounds	\$1,665
N/A	N/A	N/A	N/A	3/40	3 (stereo); headphone	4 exp slots; LFO sync to MIDI	SR-JV80 expansion boards; M-512E data card	\$1,195
N/A	N/A	N/A	N/A	5/120	3 (stereo); headphone	4 exp slots; PatchFinder; LFO sync to MIDI; sync exp	SR-JV80 expansion boards; M-512E data card	\$1,695
N/A	23,000 notes	Grid	Yes	3/19	1 (stereo); headphone	38 knobs/sliders; line/mic ins; 12-band formant filter/vocoder/robot/ vocal morph	DP-2/6 damper pedal; EV-5 expression pedal	\$1,595
4 pattern/ 4 linear	21,000 notes	Grid	N/A	2/16	1/mini-jack (stereo)	100 preset styles; chord track; 26 chord types; ad lib bar; battery operated	PMA-55 PC/Mac conversion software; DP-2M start/stop pedal	\$495
N/A	N/A	N/A	Yes	2/5+	1/ 1/4" stereo pair; 1/4" guitar	Synth wah; chromatic tuner; converts guitar to MIDI; foot pedal		\$895
N/A	N/A	N/A	N/A	5/64	2 (stereo); headphone	PatchFinder; audio input L/R		\$795



# MICROPHONES

Manufacturer	Product	Type	Polar Patterns	Internal Roll-Off	Internal Pad
AKG	C 1000S	Condenser	Cardioid, hypercardioid w/PPC 1000	N/A	N/A
AKG	C 3000	Condenser	Cardioid, hypercardioid	100 Hz	-10 dB, switchable
AKG	C 400BL	Condenser	Hypercardioid boundary layer	N/A	N/A
AKG	C 414B/TLII	Condenser	Cardioid, hypercardioid, omnidirectional, figure-8	75/150 Hz	-10/-20 dB, switchable
AKG	C 414B/ULS	Condenser	Cardioid, hypercardioid, omnidirectional, figure-8	75/150 Hz	-10/-20 dB, switchable
AKG	C 416, C416 B	Condenser	Hypercardioid	N/A	N/A
AKG	C 418, C418 B	Condenser	Hypercardioid	N/A	N/A
AKG	C 419, C 419 B, C 419 L	Condenser	Hypercardioid	N/A	N/A
AKG	C 420, C 420 B, C 420 L	Condenser	Cardioid	N/A	N/A
AKG	C 480B, CK 61	Condenser	Cardioid	70/150 Hz	-6/-10 dB
AKG	C 480B, CK 62ULS	Condenser	Omnidirectional	75/150 Hz	-10/+6 dB
AKG	C 480B, CK 63ULS	Condenser	Hypercardioid	70/150 Hz	-10 dB
AKG	C 535EB	Condenser	Cardioid	100/500 Hz	-14 dB
AKG	C 547BL	Condenser	Hypercardioid boundary layer	200 Hz	N/A
AKG	C 562BL	Condenser	Hemispherical omnidirectional	N/A	N/A
AKG	C 5900	Condenser	Hypercardioid	150 Hz	N/A
AKG	C 680BL	Condenser	Cardioid boundary layer	N/A	N/A
AKG	C 747	Condenser	Hypercardioid	150 Hz	N/A
AKG	CK 91 (w/SE 300B)	Condenser	Cardioid	75 Hz	-10 dB
AKG	CK 92 (w/SE 300B)	Condenser	Omnidirectional	75 Hz	-10 dB
AKG	CK 93 (w/SE 300B)	Condenser	Hypercardioid	75 Hz	-10 dB
AKG	CK 94 (w/SE 300B)	Condenser	Figure-8	75 Hz	-10 dB
AKG	D 112	Dynamic	Cardioid	N/A	N/A
AKG	D 230	Dynamic	Omnidirectional	N/A	N/A
AKG	D 3700, D 3700S	Dynamic	Hypercardioid	N/A	N/A
AKG	D 3800	Dynamic	Hypercardioid	N/A	N/A
AKG	D 65S	Dynamic	Hypercardioid	N/A	N/A
AKG	D 770	Dynamic	Cardioid	N/A	N/A
AKG	D 880, D 880S	Dynamic	Supercardioid	N/A	N/A
Alesis	AM51	Condenser	Cardioid	75 Hz	-10 dB, switchable
Alesis	AM52	Condenser	Cardioid, figure-8, omnidirectional	75 Hz	-10 dB, switchable
Alesis	AM61	Condenser	Cardioid	75 Hz	-10 dB, switchable
Alesis	AM62	Condenser	Cardioid, figure-8, omnidirectional, supercardioid	75 Hz	-10 dB, switchable
Audio-Technica	AT3525	Condenser	Cardioid	80 Hz	-10 dB
Audio-Technica	AT3527	Condenser	Omnidirectional	80 Hz	-10 dB
Audio-Technica	AT3528	Condenser	Cardioid	80 Hz	-10 dB
Audio-Technica	AT4033a/SM	Condenser	Cardioid	80 Hz	-10 dB
Audio-Technica	AT4041	Condenser	Cardioid	80 Hz	N/A
Audio-Technica	AT4050/CM5	Condenser	Cardioid, omnidirectional, figure-8	80 Hz	-10 dB
Audio-Technica	AT4051	Condenser	Cardioid	80 Hz	N/A
Audio-Technica	AT4060	Tube	Cardioid	Yes	N/A
Audio-Technica	AT822	Condenser	Cardioid stereo	150 Hz	N/A
Audio-Technica	AT825	Condenser	Cardioid stereo	Yes	N/A
Audio-Technica	ATM10a	Condenser	Omnidirectional	N/A	N/A
Audio-Technica	ATM23HE	Dynamic	Hypercardioid	N/A	N/A
Audio-Technica	ATM25	Dynamic	Hypercardioid	N/A	N/A
Audio-Technica	ATM31a	Condenser	Cardioid	N/A	N/A
Audio-Technica	ATM33a	Condenser	Cardioid	N/A	N/A

Max. SPL

Frequency  
ResponseSuggested  
ApplicationsSpecial  
Features

Price

137 dB	50 Hz–20 kHz	Personal studio; field recording	Battery-powered option	\$288
137 dB	20 Hz–20 kHz	General purpose		\$460
95 dB	40 Hz–14 kHz	Table-top		\$153.60
160 dB	10 Hz–20 kHz	Multipurpose (esp. vocal, strings)		\$1,398
160 dB	20 Hz–20 kHz	Multipurpose studio		\$1,258
121 dB	20 Hz–20 kHz	Instrument; amplifier	Permanent or temporary mount	\$316, \$242
131 dB	50 Hz–20 kHz	Percussion	Clip-on mount	\$316, \$242
126 dB	20 Hz–20 kHz	Horn, brass	Clip-on mount	\$316, \$242, \$242
126 dB	20 Hz–20 kHz	Vocals	Headset	\$344, \$304, \$304
144 dB	20 Hz–20 kHz	Premium recording		\$813
144 dB	20 Hz–20 kHz	Premium ambient/analysis		\$842
144 dB	20 Hz–20 kHz	Premium ambient/analysis		\$842
137 dB	20 Hz–20 kHz	Premium handheld vocal		\$338
133 dB	30 Hz–18 kHz	Edge-of-stage theatrical; conference	Shock-mounted	\$596
130 dB	20 Hz–20 kHz	Piano, conference		\$822
140 dB	20 Hz–22 kHz	Handheld vocal		\$598
115 dB	60 Hz–20 kHz	Conference; lecterns	Shock-mounted	\$276
133 dB	30 Hz–18 kHz	Snare; acoustic guitar; conference; lecterns		\$596
132 dB	20 Hz–20 kHz	General purpose		\$554
132 dB	20 Hz–20 kHz	General purpose		\$554
132 dB	20 Hz–20 kHz	General purpose		\$554
132 dB	20 Hz–20 kHz	Ambient, mid-side		\$934
Not measurable	20 Hz–17 kHz	Bass drums; bass instruments		\$382
N/A	40 Hz–20 kHz	Electronic news gathering		\$189.60
156 dB	50 Hz–20 kHz, 20 Hz–18 kHz	Stage vocal; instruments	Available with on/off switch	\$183.60, \$198
156 dB	40 Hz–21 kHz	Stage vocal; instruments		\$264
141 dB	70 Hz–20 kHz	Handheld vocal	On/off switch	\$97.60
147 dB	60 Hz–20 kHz	Stage vocal; instruments		\$124.80
147 dB	60 Hz–20 kHz	Handheld vocal	Available with on/off switch	\$138, \$150
142 dB	20 Hz–20 kHz ( $\pm 0.1$ dB)	Vocal; instrument		\$549
142 dB	20 Hz–20 kHz ( $\pm 0.1$ dB)	Vocal; instrument		\$699
139 dB	20 Hz–20 kHz ( $\pm 0.1$ dB)	Vocal; instrument		\$999
139 dB	20 Hz–20 kHz ( $\pm 0.1$ dB)	Vocal; instrument		\$1,299
146 dB	30 Hz–20 kHz	Vocal; general purpose	Includes shock mount	\$339
148 dB	30 Hz–20 kHz	General purpose		\$259
147 dB	30 Hz–20 kHz	General purpose		\$259
145 dB	30 Hz–20 kHz	General purpose	Includes AT8441 shock-mount	\$495
145 dB	20 Hz–20 kHz	Instruments		\$395
149 dB	20 Hz–20 kHz	General purpose	Includes AT8441 shock-mount	\$995
143 dB	20 Hz–20 kHz	Instruments		\$700
150 dB	20 Hz–20 kHz	Vocal; general purpose	Includes AT8560 power supply, AT8447 shock-mount	\$1,695
125 dB	30 Hz–20 kHz	Stereo recording		\$399
126 dB	30 Hz–20 kHz	Stereo recording	Battery or phantom power	\$525
137 dB	20 Hz–18 kHz	Group vocals; instruments	Battery or phantom power	\$210
N/A	70 Hz–16 kHz	Snare drum		\$235
N/A	30 Hz–15 kHz	Kick drum		\$275
137 dB	30 Hz–20 kHz	General purpose	Battery or phantom power	\$250
137 dB	30 Hz–20 kHz	General purpose	Battery or phantom power	\$290



# MICROPHONES

Manufacturer	Product	Type	Polar Patterns	Internal Roll-Off	Internal Pad
Audio-Technica	ATM35	Condenser	Cardioid	Yes	N/A
Audio-Technica	ATM63HE	Dynamic	Hypercardioid	N/A	N/A
Audio-Technica	ATM87R	Condenser	Cardioid	80 Hz	N/A
Audio-Technica	MB4000C	Condenser	Cardioid	N/A	N/A
Audio-Technica	PRO 37R	Condenser	Cardioid	N/A	N/A
Audix	ADX-50	Condenser	Cardioid	N/A	N/A
Audix	CX101	Condenser	Cardioid	N/A	N/A
Audix	CX111	Condenser	Cardioid	Yes	10 dB
Audix	D1	Dynamic	Hypercardioid	N/A	N/A
Audix	D2	Dynamic	Hypercardioid	N/A	N/A
Audix	D3	Dynamic	Hypercardioid	N/A	N/A
Audix	D4	Dynamic	Hypercardioid	N/A	N/A
Audix	OM3-xb	Dynamic	Hypercardioid	N/A	N/A
Audix	OM5	Dynamic	Hypercardioid	N/A	N/A
Audix	OM6	Dynamic	Hypercardioid	N/A	N/A
Audix	OM7	Dynamic	Hypercardioid	N/A	N/A
Audix	SCX-1	Condenser	Cardioid; hypercardioid; omnidirectional; omni presence	N/A	N/A
B.L.U.E.	Blueberry	Condenser	Cardioid	N/A	N/A
B.L.U.E.	Mouse	Condenser	Cardioid	N/A	N/A
B.L.U.E.	The Bottle	Condenser	Cardioid; omnidirectional; figure-8	N/A	N/A
Benson Audio Labs	B2	Condenser PZM	Cardioid	N/A	N/A
Benson Audio Labs	BA 30	Dynamic	Cardioid	N/A	N/A
Benson Audio Labs	ND 90	Dynamic	Hypercardioid	N/A	N/A
beyerdynamic	M-130	Dynamic ribbon	Figure-8	N/A	N/A
beyerdynamic	M-160	Dynamic ribbon	Hypercardioid	N/A	N/A
beyerdynamic	M-201TG	Dynamic	Hypercardioid	N/A	N/A
beyerdynamic	M-88TG	Dynamic	Hypercardioid	N/A	N/A
beyerdynamic	MC-740	Condenser	Wide cardioid; cardioid; hypercardioid; omnidirectional; figure-8	N/A	-10 dB
beyerdynamic	MC-834	Condenser	Cardioid	80/160 Hz	-10 dB
beyerdynamic	MCE-82	Electret condenser	Dual cardioid	120 Hz	N/A
beyerdynamic	MCE-84	Electret condenser	Cardioid	N/A	N/A
beyerdynamic	MCE-90	Condenser	Cardioid	Switchable @ 100 Hz	Switchable to -15 dB
BPM Studio Technik	BPM CR-10	Condenser	Cardioid	75 Hz/150 Hz	N/A
BPM Studio Technik	CR-4N	Condenser	Cardioid	N/A	N/A
BPM Studio Technik	CR-73 II	Dual large diaphragm; condenser	Cardioid; omnidirectional	80 Hz	-10 dB
BPM Studio Technik	CR-95	Dual large diaphragm; condenser	Cardioid; omnidirectional; figure-8	80 Hz	-10 dB
BPM Studio Technik	TB-95	Dual large diaphragm tube	Cardioid; omnidirectional; figure-8	80 Hz	-10 dB
Brauner	Valvet	Large diaphragm tube condenser	Switchable between omnidirectional and cardioid	N/A	N/A

Max. SPL	Frequency Response	Suggested Applications	Special Features	Price
145 dB	30 Hz–20 kHz	Horns; drums; instruments	Battery or phantom power; clip-on mount	\$350
N/A	50 Hz–18 kHz	Instrument amp		\$210
151 dB	30 Hz–20 kHz	Kick drum		\$299
124 dB	50 Hz–18 kHz	General purpose		\$125
141 dB	30 Hz–15 kHz	Instruments		\$175
132 dB	40 Hz–18 kHz	Drum overheads; acoustic instruments; hi-hat		\$289
135 dB	20 Hz–20 kHz	Vocal; drum overheads; acoustic instruments; room	Shock mount; flight case	\$499
145 dB	20 Hz–20 kHz	Vocal; drum overheads; acoustic instruments; guitar cabs; room	Shock mount; flight case	\$599
144 dB	46 Hz–18 kHz	Snare; percussion		\$219
144 dB	44 Hz–18 kHz	Toms; congas; general percussion		\$219
144 dB	50 Hz–19 kHz	Snare; timbale; trumpet; electric guitar		\$229
144 dB	38 Hz–19 kHz	Kick drum; acoustic bass; piano; sax		\$329
144 dB	50 Hz–18 kHz	General purpose		\$199
144 dB	48 Hz–19 kHz	Vocal		\$299
144 dB	40 Hz–19 kHz	Vocal		\$349
144 dB	45 Hz–19 kHz	Vocal		\$359
128 dB	20 Hz–20 kHz (omni); 40 Hz–20 kHz (cardioid/hypercardioid)	Acoustic instruments	Interchangeable capsules	(preamp) \$299 (per capsule) \$349
133 dB	20–22 kHz	General studio	Solid state Class A discrete w/transformer out	\$1,295
135 dB	20–22 kHz	General studio	Solid state Class A discrete w/transformer out	\$2,295
137 dB	20–22 kHz	General studio	8 interchangeable capsules w/various patterns	(w/one capsule) \$4,500 (all capsules) \$950 (w/o B4) \$1,500
141 dB	30 Hz–20 kHz	Piano; acoustic instruments; group vocals	Battery or phantom power adapter	\$259.90
145 dB	50 Hz–15 kHz	Drums; guitar amps; female vocals	Rugged, all-steel windscreen	\$169.90
145 dB	50 Hz–18 kHz	Vocals		\$349.90
116 dB	40 Hz–18 kHz	Digital recording; ambient; piano; strings		\$659
116 dB	40 Hz–18 kHz	Stringed instruments; strings		\$659
120 dB	40 Hz–18 kHz	Percussion; snare; rack toms; hi-hat		\$289
120 dB	30 Hz–20 kHz	General purpose		\$399
134/144 dB	20 Hz–20 kHz	Vocal; piano; percussion; overhead; voice-overs		\$1,599
130/140 dB 150 dB	20 Hz–20 kHz	Vocal; pianos; strings; brass; percussion; sampling; voice-overs		\$999
120 dB	50 Hz–20 kHz	Drum overhead; piano; multiple vocals		\$799.00
138 dB	50 Hz–18 kHz	Brass; percussion	Battery power	\$399
154 dB	30 Hz–20 kHz	General purpose		\$649
136 dB	20 Hz–20 kHz	Instrument; amplifier; vocal; drum; acoustic instruments	Shock mount; road case; suspension; cable; windscreen; pop filter	\$549.99
126 dB	30 Hz–20 kHz	Strings; acoustic instrument; overheads; stereo	Mic clip; pop filter	\$469.95 (omni version) \$489.95
124 dB	40 Hz–18 kHz	General purpose; vocals; amp close-miking	Case; shock-mount; pop filter; cable	\$899.95
140 dB	20 Hz–20 kHz	Vocal; overheads; amp; acoustic instrument; drums	Transformerless; custom road case; shock-mount; pop filter; XLR cable	\$1,099.95
138 dB	20 Hz–20 kHz	Vocal; acoustic instrument; drums; strings	Shock-mount; XLR cable; power supply; road case	\$1,699.99
142 dB	40 Hz–20 kHz (3 dB down points)	Reference recording	Class A amplifier; Lundahl transformer; power supply w/remote pattern switch; phase invert; shock mount; case	\$2,700



# MICROPHONES

Manufacturer	Product	Type	Polar Patterns	Internal Roll-Off	Internal Pad
Brauner	VM1	Large diaphragm tube condenser	Variable from omnidirectional through cardioid to figure-8	N/A	-10 dB
Brauner	VMS1	Large diaphragm tube condenser	Variable from omnidirectional through cardioid to figure-8	N/A	-10 dB
CAD	CAD90/95Ni	Dynamic	Cardioid	N/A	N/A
CAD	CAD95/95Ni	Condenser	Cardioid	N/A	N/A
CAD	Equitek E100	Condenser	Supercardioid	80 Hz	-20 dB
CAD	Equitek E200	Condenser	Cardioid; figure-8, omnidirectional	80 Hz	-20 dB
CAD	Equitek E350	Servo-condenser	Cardioid; omnidirectional; figure-8	80 Hz	-20 dB
CAD	VSM1	Single-valve condenser	Cardioid	80 Hz	-8/-16 dB
CAD	VX2	Dual-valve condenser	Cardioid; figure-8, omnidirectional	80 Hz	-8/-16 dB
Carvin	CM50	Dynamic	Cardioid	N/A	N/A
Carvin	CM67	Dynamic	Cardioid	N/A	N/A
Carvin	CM68	Dynamic	Cardioid	N/A	N/A
Carvin	CM90E	Condenser	Cardioid	N/A	N/A
Countryman	Isomax Headset Microphone	Condenser	Hypercardioid; cardioid	N/A	N/A
Countryman	Isomax II	Condenser	Hypercardioid, cardioid, omnidirectional, bidirectional	N/A	N/A
Crown	CM-150	Condenser	Omnidirectional	N/A	N/A
Crown	CM-311A	Condenser	Differoid	N/A	N/A
Crown	CM-700	Condenser	Cardioid	80/150 Hz	N/A
Crown	PZM 6D	PZM	Hemisphere	N/A	N/A
Crown	SASS-PMKII	Condenser	Stereo PZM	100 Hz	N/A
DPA	DPA 4006	Prepolarized condenser	Omnidirectional	N/A	N/A
DPA	DPA 4007	Prepolarized condenser	Omnidirectional	N/A	N/A
DPA	DPA 4011	Prepolarized condenser	Cardioid	N/A	-20 dB
DPA	DPA 4060	Prepolarized miniature condenser	Omnidirectional	N/A	N/A
DPA	DPA 4065	Prepolarized condenser	Omnidirectional	N/A	N/A
Earthworks	QTC1	Condenser	Omnidirectional	N/A	N/A
Earthworks	SR 71	Condenser	Cardioid	N/A	N/A
Earthworks	SR 77	Condenser	Enhanced cardioid	N/A	N/A
Earthworks	TC-30K	Condenser	Omnidirectional	N/A	N/A
Earthworks	Z30X	Condenser	Enhanced cardioid	N/A	N/A
Electro-Voice	N/D 168	Dynamic	Cardioid	N/A	N/A
Electro-Voice	N/D 267	Dynamic	Cardioid	N/A	N/A
Electro-Voice	N/D 367	Dynamic	Cardioid	N/A	N/A

Max. SPL	Frequency Response	Suggested Applications	Special Features	Price
142 dB	40 Hz–20 kHz (3 dB down points)	Reference recording	Class A amplifier; Lundahl transformer; power supply w/remote pattern switch; phase invert; shock mount, case; windscreen	\$5,000
142 dB	40 Hz–20 kHz (3 dB down points)	Reference recording	Class A mic amplifier; outboard power supply; pad; phase invert; ground lift; shock mount; windscreen, case	\$7,500
N/A	40 Hz–16 kHz	Vocal; instrument amps		\$199
130 dB	40 Hz–20 kHz	Vocal; instruments		\$239
148 dB	10 Hz–18 kHz	Vocal; instruments; overhead; drum kit	6 hrs on 2 NiCad batteries	\$469
148 dB	10 Hz–18 kHz	Vocal; orchestra; acoustic guitar; kick drum	6 hrs on 2 NiCad batteries	\$749
148 dB	10 Hz–20 kHz	Vocal; piano; overhead; acoustic guitar; amp	OS110, 1.1" Optema Series capsule	\$899
149 dB	10 Hz–20 kHz	Vocal; strings; guitar	VX2 valve topology and Equitek servo technology; OS110, 1.1" Optema Series capsule	\$1,299
145 dB	10 Hz–20 kHz	Vocal; strings; overhead	Dual humbucking transformers; twin tubes; 1.25" capsule; optional capsules	\$2,249
N/A	50 Hz–14 kHz	Vocals	On/off switch	\$49.95
N/A	40 Hz–15 kHz	Vocals		\$89.95
N/A	45 Hz–15 kHz	Vocals		\$89.95
132 dB	30 Hz–20 kHz	General purpose	Battery or phantom power	\$114.95
150 dB	20 Hz–20 kHz	Vocals	Phantom version has pop-free switch	\$307.92
150 dB	Isomax II H, C, B: 50 Hz–20 kHz, Isomax II O: 20 Hz–20 kHz	General instrument; sound reinforcement and exotic (acoustical measurements)	Miniature size; optional 18V battery power module; special version powers from wireless transmitters	\$278.05
130 dB	20 Hz–20 kHz	General purpose		\$795
150 dB	50 Hz–15 kHz	Vocals		\$299
151 dB	30 Hz–20 kHz	Drums; brass; strings; guitar		\$289
150 dB	20 Hz–20 kHz	Piano		\$369
150 dB	20 Hz–20 kHz	Orchestra; church ensemble		\$950
143 dB	20 Hz–20 kHz	Close-miking vocals; strings; woodwinds; digital recording		\$2,060
155 dB	20 Hz–40 kHz	Close-miking drums; percussion; brass		\$2,060
158 dB	40 Hz–20 kHz (on axis)	Orchestra; percussion; guitar; piano; sax; drums; brass; strings; voice	5.4 mm size; handles heat, sweat, humidity	\$2,190
134 dB	20 Hz–20 kHz	General purpose	5.4 mm size; handles heat, sweat, humidity	(pigtail version) \$400
144 dB	20 Hz–20 kHz $\pm$ 2dB	Theater; stage; broadcast	5.4 mm size; handles heat, sweat, humidity	\$599
140 dB	4 Hz–40 kHz	Classical location recording	Quiet, time-coherent sound	\$950; \$2,000 (matched pair in cherry box)
145 dB	50 Hz–30 kHz	General purpose	Uncolored sound on axis; excellent rejection off axis	\$399 (in the Earthworks tube)
145 dB	30 Hz–30 kHz	Voice; guitar; drums; general purpose	Uncolored sound on axis; excellent rejection off axis	\$950; \$2,000 (matched pair in cherry box)
150 dB	9 Hz–30 kHz	Drums; guitar; bass		\$500; \$1,100 (matched pair in cherry box)
145 dB	30 Hz–30 kHz	Voice; guitar; drums; general purpose	Uncolored sound on axis; excellent rejection off axis	\$950; \$2,000 (matched pair in cherry box)
141 dB	25 Hz–15 kHz	Snare drum	3-way swivel-mount clamp; very small capsule; gig bag	\$182
144 dB	65 Hz–19 kHz	Vocals	Stand clamp; gig bag	\$140
144 dB	60 Hz–17 kHz	Female vocals	Frequency contour for female voice; stand clamp; gig bag	\$200



# MICROPHONES

Manufacturer	Product	Type	Polar Patterns	Internal Roll-Off	Internal Pad
Electro-Voice	N/D 468	Dynamic	Supercardioid	N/A	N/A
Electro-Voice	N/D 767	Dynamic	Supercardioid	Yes	N/A
Electro-Voice	N/D 868	Dynamic	Cardioid	N/A	N/A
Electro-Voice	N/D 967	Dynamic	Supercardioid	Yes	N/A
Electro-Voice	RE1000	Condenser	Supercardioid	130 Hz	N/A
Electro-Voice	RE20	Dynamic	Variable-D cardioid	80 Hz	N/A
Electro-Voice	RE200	Condenser	Cardioid	N/A	N/A
Electro-Voice	RE38N/D	Dynamic	Cardioid	N/A	N/A
Electro-Voice	RE500	Condenser	Cardioid	N/A	N/A
Event Electronics	Classic	Large diaphragm tube condenser	Omnidirectional through cardioid; figure-8 (9 positions)	125 Hz	-10/-20 dB
Event Electronics	NT1	Large diaphragm condenser	Cardioid	N/A	N/A
Event Electronics	NT2	Large diaphragm condenser	Omnidirectional; cardioid	150 Hz	-10 dB
Fostex	221	Dynamic	Cardioid	N/A	N/A
Fostex	321	Dynamic	Cardioid	N/A	N/A
Fostex	521	Dynamic	Cardioid	N/A	N/A
Independent Audio	Coles 4038	Ribbon	Figure-8	N/A	N/A
Independent Audio	Coles 4104	Ribbon	Figure-8	50 Hz	N/A
Independent Audio	Coles Electroacoustics 4038	Ribbon	Figure-8	Yes	N/A
Independent Audio	Coles Electroacoustics 4104	Ribbon	Cardioid	Yes	N/A
Independent Audio	Pearl Lab (Sweden) CC22 Microphone	Condenser	Cardioid	N/A	N/A
Independent Audio	Pearl Lab (Sweden) MS 60 Stereo Condenser	Condenser	Multi-pattern	N/A	N/A
Independent Audio	Pearl Lab (Sweden) MS 8 Stereo Condenser	Condenser	Cardioid; Figure-8	N/A	N/A
Independent Audio	Pearl Lab (Sweden) TL66 Mono Condenser	Condenser	Cardioid; omnidirectional	N/A	N/A
Independent Audio	Pearl Lab (Sweden) TLC Mono Condenser	Condenser	Cardioid	N/A	N/A
Langevin	CR-3A	FET, large diaphragm condenser	Cardioid	100 Hz	-10 dB
Lawson	L47C	Large diaphragm tube condenser	Cardioid	N/A	-12 dB
Lawson	L47MP	Large diaphragm tube condenser	Omni, cardioid; figure-8	N/A	-12 dB
Lawson	L47S	Phantom-powered large diaphragm condenser	Cardioid	100 Hz	-10 dB
Lawson	L47SH	Phantom-powered large diaphragm condenser	Cardioid	100 Hz	-10/-20 dB
Manley Labs	Manley Reference Cardioid Microphone	Large diaphragm condenser	Cardioid	N/A	10 dB
Manley Labs	Manley Reference Gold Microphone	Large diaphragm condenser	Variable via potentiometers	N/A	10 dB
Manley Labs	Manley Reference Stereo Gold Microphone	2 x large-diaphragm condenser	Variable via potentiometers	N/A	2 x 10 dB
MicroTech	Gefell M300	Condenser	Cardioid	N/A	N/A
MicroTech	Gefell MT 711S	Condenser	Cardioid	90 Hz	-10 dB
MicroTech	Gefell UMT 70S	Condenser	Cardioid, omnidirectional, figure-8	90 Hz	-10 dB
Neumann	KM 120	Small diaphragm condenser	Figure-8	N/A	-10 dB

Max. SPL	Frequency Response	Suggested Applications	Special Features	Price
144 dB	60 Hz–22 kHz	Musical instruments	Flexible pivoting yoke; gig bag	\$232
144 dB	25 Hz–22 kHz	Vocals	Large diaphragm N/DYM transducer; multistage shock mount; gig bag	\$342
140 dB	20 Hz–10 kHz	Kick drum	Tuned for bass drums	\$282
142 dB	50 Hz–13 kHz	Vocals	High gain before feedback; removable grille	\$282
130 dB	70 Hz–18 kHz	Vocals; room; wind instruments; acoustic guitar		\$774
148 dB	45 Hz–18 kHz	Bass; drum; vocals; upright bass; toms; electric guitars	Variable-D design	\$655
130 dB	50 Hz–18 kHz	Drums; acoustic guitar; brass		\$310
144 dB	25 Hz–20 kHz	Toms; snare; guitar cabs	16-position EQ switch	\$582
148 dB	80 Hz–18 kHz	Vocals	Handheld	\$375
130 dB	20 Hz–20 kHz	Vocals; critical instrument	External power supply w/30' cable; tube/diaphragm; shock-mounted	\$1,995
135 dB	20 Hz–20 kHz	General purpose	Case	\$349
135 dB	20 Hz–20 kHz	Vocals; acoustic guitar; woodwinds; piano	Shock mount; case	\$649
N/A	100 Hz–16 kHz	Vocals		\$35
N/A	90 Hz–16 kHz	Vocals		\$55
N/A	60 Hz–16 kHz	Vocals		\$75
125/150 dB	30 Hz–15 kHz	Drum overheads; sax; string instruments; brass; voice; electric guitar; bass		\$1,195
120 dB	60 Hz–12 kHz	Teleconferencing; multimedia; on-location	Lip bar for flat voice response	\$660
125 dB	30 Hz–15 kHz	Horns; piano; guitar	Rigid mic mount	\$1,195
120 dB	60 Hz–12 kHz	Noisy environment	Noise canceling	\$660
126 dB	20 Hz–25 kHz	Vocals; instruments	Dual membrane	\$1,228
126 dB	18 Hz–25 kHz	Stereo	4 dual-membrane rectangular capsules	\$4,948
130 dB	29 Hz–25 kHz	TV; video; film	Rycote Win	\$1,956
132 dB	20 Hz–20 kHz	Percussion		\$549
144 dB	20 Hz–20 kHz	Vocal		\$581
132 dB	40 Hz–16 kHz	General purpose	Shock mount	\$800
124 dB	20 Hz–20 kHz	Vocals; acoustic guitar; strings; piano; choirs; orchestra; sax	30' Mogami cable; Pelican carrying case; 5-year warranty	\$1,695
128 dB	20 Hz–20 kHz	Vocals; acoustic guitar; strings; piano; choir; orchestra; sax	30' cable; Pelican case; 5-year warranty	\$1,995
138 dB	20 Hz–20 kHz	Vocals; acoustic guitar; strings; piano; choir; orchestra; horns	Pelican case; 5-year warranty	\$1,295
145 dB	20 Hz–20 kHz	High-intensity (especially bass drum)	Pelican case; 5-year warranty	\$1,295
135 dB	20 Hz–20 kHz	Vocal; general purpose	All tube; line-out option	\$3,000
150 dB	10 Hz–25 kHz	Ultra-high-quality recording	All tube; line-out option	\$5,500
150 dB	10 Hz–25 kHz	Ultra-high-quality stereo recording	All tube; 1 fixed/1 rotatable cap; line-out option	\$8,000
135 dB	40 Hz–18 kHz	Drums; guitar; chorus		\$599
144 dB	40 Hz–18 kHz	Vocals	Cable; windscreen; stand mount	\$895
149 dB	40 Hz–18 kHz	General purpose	Cable; windscreen; stand mount	\$1,295
148 dB (w/pad); 138 dB (w/o pad)	20 Hz–20 kHz	One of stereo pair for midside/Blumlein recording		\$1,275

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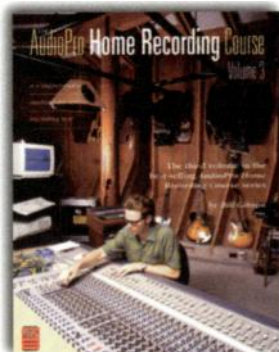


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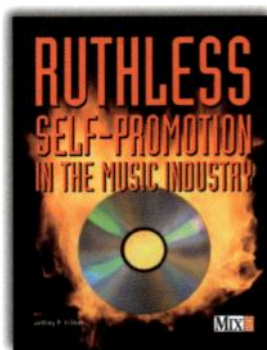
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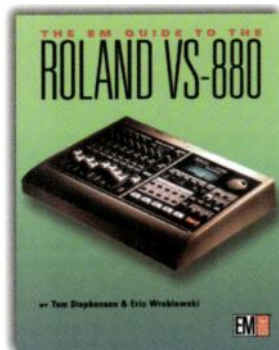
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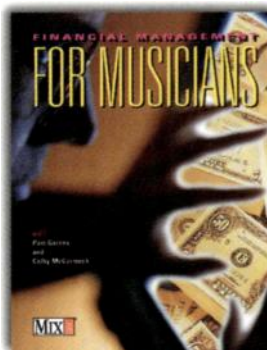
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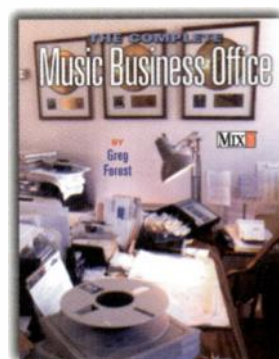
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Manufacturer	Product	Type	Polar Patterns	Internal Roll-Off	Internal Pad
Neumann	KM 130	Small diaphragm condenser	Omnidirectional	N/A	-10 dB
Neumann	KM 140	Small diaphragm condenser	Cardioid	N/A	-10 dB
Neumann	KM 184	Small diaphragm condenser	Cardioid	N/A	N/A
Neumann	TLM 103	Large diaphragm condenser	Cardioid	N/A	N/A
Neumann	TLM 193	Large diaphragm condenser	Cardioid	N/A	N/A
Peavey	PVM T-9000	Tube mic w/self-polarized condenser capsule	Cardioid	N/A	-10 dB
Roland	DR-10	Dynamic	Hypercardioid	N/A	N/A
Roland	DR-20	Dynamic	Hypercardioid	N/A	N/A
Samson	Q Mic	Dynamic	Hypercardioid	N/A	N/A
Samson	Q2	Dynamic	Cardioid	Switchable	Switchable
Samson	Q3	Dynamic	Hypercardioid	Switchable	Switchable
Samson	S11	Dynamic	Unidirectional cardioid	N/A	N/A
Samson	S12	Dynamic	Hypercardioid	N/A	N/A
Sanken	CU-31	Condenser	Cardioid	N/A	N/A
Posthorn Recordings	CCM 4	Condenser	Cardioid	N/A	N/A
Posthorn Recordings	CMB1	Condenser	Cardioid; omnidirectional; figure-8	N/A	-15 dB
Posthorn Recordings	CMC 641	Condenser	Supercardioid	N/A	N/A
Sennheiser	E 604	Dynamic	Cardioid	N/A	N/A
Sennheiser	MD 421 II	Dynamic	Cardioid	30 Hz-17 kHz	N/A
Sennheiser	MD 425	Dynamic	Supercardioid	N/A	N/A
Sennheiser	ME 64/K 6	Electret condenser	Cardioid	120 Hz	N/A
Shure	Beta 52	Dynamic	Supercardioid	N/A	N/A
Shure	Beta 87A	Condenser	Supercardioid	N/A	N/A
Shure	BG4.1	Condenser	Cardioid	N/A	N/A
Shure	BG5.1	Condenser	Cardioid	N/A	N/A
Shure	SM57	Dynamic	Cardioid	N/A	N/A
Shure	SM58	Dynamic	Cardioid	N/A	N/A
Shure	SM7A	Dynamic	Cardioid	N/A	N/A
Shure	SM81	Condenser	Cardioid	80 Hz and 100 Hz	-10 dB
Shure	SM94	Condenser	Cardioid	N/A	N/A
Shure	SM98A	Condenser	Cardioid; supercardioid	80 Hz	-10 dB
Shure	VP88	MS stereo condenser	Mid: cardioid; side: bidirectional	80 Hz	N/A
Sony	C48	Condenser	Uni-, omni-, bidirectional	Yes	-10 dB
Sony	ECM-MS957	Stereo condenser	m-s, x-y	N/A	N/A
Sony	F740/9X	Dynamic	Unidirectional	N/A	N/A
Sony	F780	Dynamic	Unidirectional	N/A	N/A
Soundelux	PTM	Condenser	Cardioid	N/A	N/A
Soundelux	U195	Condenser	Cardioid	80 Hz	Variable
Soundelux	U95	Condenser	Variable	N/A	N/A
Soundelux	U95S	Condenser	Variable	N/A	N/A
Soundelux	U97	Condenser	Omnidirectional, cardioid, hypercardioid; figure-8	N/A	N/A
SoundField	SoundField Mark 5	4-element condenser	Variable omnidirectional, cardioid; figure-8	40 Hz	-10/-20/-30 dB
SoundField	SoundField SPS422	4-element condenser	Variable omnidirectional, cardioid; figure-8	80 Hz	-10/-20/-30 dB

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150 dB (w/pad), 140 dB (w/o pad)	20 Hz–20 kHz	Room; strings; piano; choir		\$1,060
148 dB (w/pad), 138 (w/o pad)	20 Hz–20 kHz	Acoustic guitar; drum overheads; instruments; class spot; overhead; piano		\$1,060
138 dB	20 Hz–20 kHz	Acoustic guitar; drum overheads; hi-hat; strings; perc; piano		\$699
138 dB	20 Hz–20 kHz	Vocals; acoustic guitar; strings; Foley; acoustic bass; piano	7 dB (A) self noise	\$995
140 dB	20 Hz–20 kHz	Vocals; drum overheads; acoustic guitar; strings; sax; percussion; piano		\$1,495
137 dB	20 Hz–20 kHz	Vocals; acoustic instrument	Integral shock suspension; 200 Hz LC; cable; shock mount; power module	\$1,299.99
130 dB	60 Hz–15 kHz	General purpose	On/off switch; windscreen; case	\$95
130 dB	60 Hz–15 kHz	General purpose	On/off switch; windscreen; case	\$150
137 dB	20 Hz–18.5 kHz	Vocals	Tight hypercardioid pattern	\$199.99
137 dB	50 Hz–15 kHz	Vocal; instruments	Gold-plated XLR; case; clip; Eurometric adapter	\$149.99
137 dB	50 Hz–15 kHz	Drums; instruments	Rotates 90 degrees; gold-plated XLR; case; clip; Eurometric adapter	\$224.99
130 dB	60 Hz–18 kHz	Vocals	Molded case; clip	\$99.99
130 dB	60 Hz–18 kHz	Vocals	Molded case; clip	\$149.99
148 dB	20 Hz–18 kHz	High-pressure sources; brass; drums	Right-angle version available (model CU-32)	\$699
132 dB	18 Hz–22 kHz	15' cable		\$1,470
132 dB	18 Hz–22 kHz	Portable recorder	Internal battery; 15' cable	\$1,190
132 dB	18 Hz–22 kHz	Film/video boom	Interchangeable capsules	\$1,455
160 dB	40 Hz–18 kHz	Drums (especially toms)	Glass-composite housing	\$249
160 dB	30 Hz–17 kHz	Drums; vocals; guitar; amps		\$485
145 dB	40 Hz–18 kHz	Vocals	Sculpted steel body	\$349
130 dB	40 Hz–20 kHz	Acoustic guitar; drum overhead	Interchangeable capsules	\$540
174 dB	20 Hz–10 kHz	Kick drum; bass amp; acoustic bass	Tailored for bass instruments	\$387.50
142 dB	50 Hz–18 kHz	Vocals; live; studio	High gain before feedback	\$542.50
131 dB	40 Hz–18 kHz	Guitar; cymbals; strings; vocals; piano	Battery or phantom power	\$275
132 dB	70 Hz–16 kHz	Vocals	Battery or phantom power	\$275
N/A	40 Hz–15 kHz	Guitar amp; drums; guitar; vocals	Classic instrument response curve	\$146
N/A	50 Hz–15 kHz	General purpose	Classic vocal response curve	\$168
N/A	50 Hz–20 kHz	Vocals; bass amp		\$584
146/136 dB	20 Hz–20 kHz	Guitar; cymbals; strings; vocals; piano		\$529.80
141 dB	40 Hz–16 kHz	Guitar; cymbals; strings; vocals; piano	Battery or phantom power	\$280
144 dB	40 Hz–20 kHz	Drums; brass; woodwinds	Minicondenser; mounting clamp	\$349.80
129 dB	40 Hz–20 kHz	Single-point stereo	Internal matrix or MS out	\$1,194
128 dB	30 Hz–16 kHz	Vocals; guitar	48V or 9V internal battery	\$1,150
115 dB	50 Hz–18 kHz	Stereo DAT; overhead piano; guitar; drum	1,000-hour battery; rotating caps; x-y/m-s switch; stand; windscreen; cable; bag	\$299
N/A	50 Hz–15 kHz	Vocals; guitar		\$245
N/A	50 Hz–18 kHz	Vocals; guitar		\$350
135 dB	30 Hz–20 kHz	Vocals; drums; guitars	1" capsule	\$1,200
125 dB	20 Hz–20 kHz	Close mic situations	1" capsule; "fat" bass switch	\$995
130 dB	20 Hz–20 kHz	Vocals; overhead; acoustic guitar	1" capsule	\$1,995
134 dB	15 Hz–20 kHz	General studio	1" capsule	\$3,600
138 dB	20 Hz–20 kHz	Close mic situations	1" capsule	\$599
145 dB	20 Hz–20 kHz	Reference stereo or B format	Tetrahedral array w/preamp; variable stereo angle; shock mount; end fire/invert; test oscillator; low cut; headphone amp	\$7,999
145 dB	20 Hz–20 kHz	Stereo/mono; mid-side recording	Stereo output; 1U preamp; variable stereo angle; end fire/invert; headphone amp	\$3,999



# MICROPHONES

Manufacturer	Product	Type	Polar Patterns	Internal Roll-Off	Internal Pad
SoundField	ST250	4-element condenser	Variable omnidirectional, cardioid, figure-8	120 Hz	-20 dB
Stedman	C15	Condenser	Cardioid	N/A	N/A
Stedman	LD23	Dynamic	Supercardioid	N/A	N/A
Stedman	LD50	Dynamic	Supercardioid	N/A	N/A
Stedman	N90	Dynamic	Cardioid	N/A	N/A
Stedman	SC3	Condenser	Cardioid	100 Hz	-9/-18 dB
Stedman	Transonic-TR1	Dynamic	Cardioid	80Hz	N/A
Studiomaster	KM-81	Dynamic	Cardioid	N/A	N/A
Telex	Cobalt SE-60	Permanently charged, backplate condenser	Cardioid	N/A	N/A
Telex	TD-16s	Dynamic	Unidirectional	N/A	N/A
Telex	TD-22	Dynamic	Cardioid	N/A	N/A
Telex	TD-26	Dynamic	Hypercardioid	N/A	N/A
Yorkville Sound	Apex 350	Dynamic	Hypercardioid	N/A	N/A
Yorkville Sound	Apex 380	Dynamic	Hypercardioid	N/A	N/A
Yorkville Sound	Apex 750	Dynamic	Cardioid	N/A	N/A
Yorkville Sound	Apex 770	Dynamic	Cardioid	N/A	N/A
Yorkville Sound	Apex 850	Dynamic	Cardioid	N/A	N/A
Yorkville Sound	Apex 950	Dynamic	Cardioid	N/A	N/A

# DRUM MACHINES

Manufacturer	Product	# of Pads/ Touch Sensitive	Non-Percussion Sounds	Onboard Effects	# of Sounds	# of Patterns Preset/User
Akai	MPC2000 MIDI Production Center	16/velocity & pressure	Yes	Optional 4-bus effects processor	N/A	0/99
Alesis	SR-16	12/velocity	Yes	No	100	200/200
Jomox	XBase 09	5/velocity	Yes	No	8+	64
Roland	BOSS DR-770 Dr. Rhythm	16/velocity	4 bass	5 rrvb, 2 flngr & chrs, 2-band EQ	255	400/400
Zoom	Rhythmtrak 123	13/4	Yes/bass	Yes	80 drum kits/ 25 bass programs	297/99
Zoom	Rhythmtrak 234	13/Y	Yes/bass	Yes	124 drum kits/ 50 bass programs	99/99 + 99 groove

Max. SPL	Frequency Response	Suggested Applications	Special Features	Price
135 dB	20 Hz–20 kHz	Location mono/stereo; mid/side; B format	Tetrahedral array w/port preamp, variable stereo angle, end fire/invert, B format out; cable, headphone amp	\$4,999
132 dB	25 Hz–19 kHz	General purpose	Super-buffered output	\$599
157 dB	38 Hz–18 kHz	Live vocals; instruments		\$139
152 dB	37 Hz–19 kHz	Live instruments	Large diaphragm	\$139
155 dB	35 Hz–19 kHz	General purpose		\$399
150 dB	25 Hz–20 kHz	General purpose	Vintage and enhanced modes	\$998
152 dB	33 Hz–19 kHz	Vocal, instrument	Stage/studio EQ settings	\$159
119 dB	50 Hz–15 kHz	Personal studio	20' cable; adapter, case	\$59.95
141 dB (phantom), 137 dB (battery)	30 Hz–19 kHz	Instrument; amplifier	Cobalt blue finish	\$175
131 dB	45 Hz–17 kHz	Drums, vocals, guitar		\$89
128 dB	35 Hz–19 kHz	Drums, vocals, guitar		\$135
130 dB	30 Hz–19 kHz	Vocals		\$149
N/A	50 Hz–15 kHz	Instruments, vocals		\$85
N/A	50 Hz–15 kHz	Vocals; instruments		\$115
N/A	50 Hz–15 kHz	Vocals		\$55
N/A	50 Hz–15 kHz	Instruments		\$45
N/A	15 Hz–12 kHz	Vocals		\$35
N/A	80 Hz–12 kHz	Vocals		\$25

# Songs	Quantization Types/ppan	# of Output/Type	Ports MIDI In/Out/Thru	Special Features	Price
N/A	8th, 8th triplet, 16 w/swing, 16th triplet, 32nd, 32nd triplet/96	2 exp to 10 / 1/4"	2/2/0	Reads S1000/S3000/XL-series/MAV files; automated mixing; 64 tracks; 100K note sequencer	\$1,599
10	96	4 1/4"	1/1/1	Sync; Start/Stop fsw; Fill/A-B/Count fsw	\$349
10	Shuffle	3 1/4" (+1 mono mix)	1/1/1	Analog/digital hybrid; DIN sync; step sequencer	\$1,050
100	Various/96	1 stereo; 1 mono; headphone (mini)	1/1/0	(9DPP), ambience cntrl w/16 global choices; quick search for fast pattern location by music category	\$495
99	Various/96	2 1/4" + phones	1/0/0	Line-in for jamming along	\$299.99
99	Various/96	2 1/4" + phones	1/0/0	Line-in for jamming along; 3 drum tracks & one bass track can play simultaneously	\$429.99



# 5

## Environment & Power Products

The three charts in this section contain information about products that will help you convert your room into a practical space for a personal studio. As you plan your studio, you'll want to consider how all the various components—including your mixer, rack gear, synths, and computers—will be housed. We also provide information on acoustically treating your workspace (see “The Personal Studio Makeover” on p. 14).

The Sonic Treatment chart covers raw and preformed absorbers, diffusers, bass traps, and other sound-control materials. In many cases we list a family of products (such as a line of absorbers) but not every size within that family. Often different sizes will have different absorptive qualities; you can generally get these specs directly from the manufacturer. (Contact information for all companies whose products are listed in the *Personal Studio Buyer's Guide* is provided in the Manufacturer Index on p. 163.)

“Studio Furniture” is just what it sounds like: a workstation that includes one or more tables and racks to hold your gear. We've stuck with the basic specs in this chart, but they should be enough to get you started. Keep in mind that most studio-furniture companies make customized configurable products that could not be listed in a table, so if you don't see exactly what you want, contact the manufacturer. Also, note that some of the furniture comes in unusual shapes; fortunately, many companies offer photos on their Web sites to give you a better idea of what a product looks like.

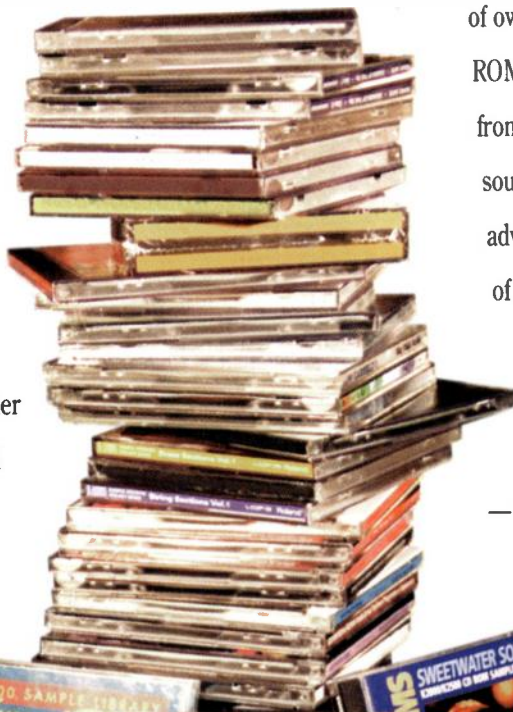
Finally, you'll need plenty of power outlets, ideally with line conditioning and some level of protection against damaging voltage changes. The Power Products chart provides information on power strips and power conditioners of various types and specifications, including rack-mountable models. In addition to basic surge and spike protection and the ability to filter electromagnetic interference (EMI) and radio-frequency interference (RFI), some of the devices can regulate the voltage at a fixed level so that even the slightest rise or drop is smoothed out. A few units also serve as uninterruptible power supplies (UPSs); these can be especially useful in situations involving RAM-based devices such as computers and samplers, where even a brief power failure can mean data loss.

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# SONIC TREATMENT

Manufacturer	Model	Type	Fire Rating	Dimensions	Special Features	Price
ASC	Acoustic enclosures	Acoustic enclosures	N/A	Varies	Modular steel isolation enclosures	\$4,700–\$10,500
ASC	Attack Wall System	Acoustic subspace (gobos)	N/A	Varies	Studio traps/monitor stands; isolates listening position from room	\$4,000–\$10,000
ASC	Monitor Stand Bass Trap	Monitor stand and bass trap combined	N/A	13", 16", 20" diameter, up to 4' tall	Eliminates midbass hump; 200 lb. load capacity	\$698–\$1,356
ASC	Quick Sound Field (QSF) System	Acoustic subspace (gobos)	N/A	Varies	8 or more studio traps; increase/decrease ambience via placement; adjustable for bright or dead recording	Starts at \$2,520
ASC	Studio Trap	Bass trap and main building block of Attack Wall and QSF systems	N/A	9" diameter x 4' tall, can be raised to 6.5' (includes stand)	Diffusive side and absorptive side; adjustable; absorbs 110 Hz and 400 Hz	\$315
ASC	Tube Trap	Bass trap	N/A	9", 11", 16", 20" diameter, 4' tall	Bass absorption down to 35 Hz with built-in diffusion above 400 Hz	\$248–\$678
Acoustical Solutions	AAP AlphaPyramid	Sound-absorbing foam	ASTM E-84 Class 2	2x2' sheets; 2", 3", and 4" thick	Matching pattern; variety of colors; NRC 0.70–1.05	(box) \$165–\$178
Acoustical Solutions	AB10-NR Audio-Seal Sound Barrier	Sound-transmission blocker; high temperature-fused vinyl	N/A	Roll: 54"x60"x0.13"	STC 27; stops noise from transmitting through walls, floors, and ceilings	(per square foot) \$1.75–\$2.25
Acoustical Solutions	AS1, AS2 AlphaSorb Panels	Rigid, sound-absorbing; fabric-wrapped wall panels and hanging baffles	Class 1	Any size up to 4x10'; 1" or 2" thick	NRC 0.80–1.05; 48 colors; custom shapes and cut-outs	\$39–\$280
Acoustical Solutions	Soundtex; SD2BT; SD2YD	Fabric wall covering	Class 1	Bolt: 54' x 35 yards; linear yard: 54x36"	12 colors; NRC 0.25; easy to install	(Bolt) \$850 (Yard) \$32
Acoustics First	Acoustical Materials-General	Absorbers, diffusers, barriers, etc.	Class A; Class 1, Class 3	Varies	Custom foam and fiberglass products of various types	Varies
Acoustics First	Bermuda Broadband Triangle Trap	Corner Absorber	Class 1 melamine or Class 3 polyurethane	1x1x4	Also available as Bermuda Shorts (24") and stand-alone Sound Cylinder	\$42
Acoustics First	Double Duty Diffuser	Polycylindrical diffuser/bass trap	Class A	2x2 to 4x8	Uniform high-frequency dispersion; increases acoustic size of a mixing room	±\$200
Acoustics First	Geometrix	Broadband absorber	Class A	8" diameter up to 10' tall	Formed fiberglass covered w/Guiford FR701 fabrics; 0.84 absorption at 125 Hz, 1.00 above	(4") \$157
Auralex Acoustics	Auralex Metro	Absorptive foam	Class B	2x4' panels; 2" thick	12 colors; "cityscape" profile; seamless installation; 12 panels per box; includes shipping; NRC 0.70	(box) \$226.99
Auralex Acoustics	LENRD (Low End Noise Reduction Device)	Bass trap	Class B	24" tall x 16" wide	12 different colors; 8 pieces per box; triangular to fit corners; includes shipping; NRC 1.35	(box) \$256.99
Auralex Acoustics	SheetBlok	Sound barrier	Class B	0.13" thick; 4x10' and 4x30' roll sizes	STC 27; impervious to solvents; includes shipping	(4x10') \$139.99 (4x30') \$359.99
Auralex Acoustics	Studiofoam	Absorptive foam	Class B	2x4' panels; 1", 2", 3", and 4" thick	12 colors; wedge cut; 6–20 pieces per box; includes shipping; NRC 0.50–1.10	(box) \$199.99–\$235.99
Auralex Acoustics	Studiofoam Pyramids	Absorptive foam	Class B	2x4' panels; 2" and 4" thick	12 colors; pyramid cut; seamless installation; 6–12 pieces per box; includes shipping	(box) \$279.99
Auralex Acoustics	Sunburst 360	Absorptive foam	Class B	4' tall, adjustable to more than 7'4"	Stand-mounted near-field acoustical control; 12 colors; sunburst cut; sunburst females; 2 per box	(box) \$278.99
Auralex Acoustics	T-Fusor	Diffusor	N/A	23.75x23.75	Wall mountable; fits drop ceilings; easily painted; 4 pieces per box; includes shipping	(box) \$299.96
MATK	Floating Floor Kit #1 and #2	Floating floor kit	N/A	Kit#1: 10x15' Kit#2: 19x20'	Custom rubber floor decouplers; foam spacing guides; installation options/suggestions; software conversion guide; "Room Optimizer" software	(Kit#1) \$575 (Kit#2) \$875

# SONIC TREATMENT

Manufacturer	Model	Type	Fire Rating	Dimensions	Special Features	Price
Folded Space	Acoustic Space	Modular system: diffusor, absorptive foam, acoustic panels, gobos	Class B foam and wood	Each panel 2x4'	128 sq ft of surface area (64 reflective/64 absorptive); 8 acoustic panels; 4 sets of stilts and linking hardware	\$549
Folded Space	Big Travel Kit	Modular system: diffusor, absorptive foam, acoustic panels, gobos	Class B foam and wood	Each panel 2x4'	64 sq ft of surface area (32 reflective/32 absorptive); 4 panels, 2 sets of stilts, stacking and linking hardware; produces 2 bi-folds on stilts, 4 freestands, or 1 stacked bifold	\$279
Folded Space	Folded Wall	Modular system: bass trap, diffusor, absorptive foam, acoustic panels, gobos	Class B foam and wood	Each panel 2x4'	Over 128 sq ft of surface area; 8 panels, 4 sets of linking hardware, 2 stacking kits; may be set up in subspace arrays	\$549
Folded Space	Medium Room Kit	Modular system: diffusor, absorptive foam, acoustic panels, gobos	Class B foam and wood	Each panel 2x4'	Over 128 sq ft of surface area; 8 panels, 2 swivel stands, 2 sets of stilts, 6 standoffs, linking hardware, and 2 extra 2x4' slices of Studiofoam	\$649
Folded Space	Small Room Kit	Modular system: diffusor, absorptive foam, acoustic panels, gobos	Class B foam and wood	Each panel 2x4'	64 sq ft surface area (32 reflective/32 absorptive); 4 panels, 2 swivel stands, linking hardware, wall standoffs, and 2 extra 2x4' slices of 2" Studiofoam	\$329
Folded Space	Small Travel Kit	Modular system: diffusor, absorptive foam, acoustic panels, gobos	Class B foam and wood	Each panel 2x4'	Two panels (32 sq ft of surface area), 1 set of stilts and linking hardware; makes a bifold on stilts or 2 freestanding floor panels	\$144
Folded Space	Space Doc	Modular system: diffusor, absorptive foam, acoustic panels, gobos	Class B foam and wood	Each panel 2x4'	96 sq ft of surface area (48 reflective/48 absorptive); 6 panels, 2 swivel stands, 2 sets of stilts, and linking hardware	\$439
Folded Space	Space Doc Plus	Modular system: bass trap, diffusor, absorptive foam, acoustic panels, gobos	Class B foam and wood	Each panel 2x4'	164 sq ft of surface area, 6 cloaking-device panels plus LENRD bass traps, and 6 2x4' slices of 2" Studiofoam	\$599
Folded Space	VOX BOX	Modular system: diffusor, absorptive foam, acoustic panels, gobos	Class B foam and wood	Each panel 2x4'	128 sq ft of surface area (64 reflective/64 absorptive); designed for vocals; 8 panels mounted on 4 double-height swivel stands	\$699
Illbruck	SONEX	Absorptive foam	Class 1 or 2	2x4' or 4x4', 2", 3" and 4" thick	Many colors and patterns available	(per square foot) \$2.50-\$6
Industrial Acoustics	Quad Series Rooms	Noise reduction, bass trap, diffusion, absorption	Available upon request	Custom	Complete studio treatment	Starts at \$7,000
Markertek Video	Blade Tiles: BT-2, BT-3, BT-4	Acoustic foam	UL94-HF-01	BT-2: 2x16x16"; BT-3: 3x16x16"; BT-4: 4x16x16"	Available in charcoal gray or medium blue (BT-2, BT-3 only); for studios and control rooms	(BT-2) \$3.49 (BT-3) \$4.49 (BT-4) \$5.49
Markertek Video	Markerfoam MF-3 and MF-4	Acoustic foam sheets	UL94-HF-01	MF-3: 54x54x2"; MF-4: 54x54x3"	Available in charcoal gray or medium blue, for studios and control rooms	(MF-3) \$19.99 (MF-4) \$29.99
Netwell Noise Control	Pyramids	Acoustic foam	Class 1 or 2	24x24x3" thick	Absorbs 90% of reflected sound	(per square foot) \$2-\$4
RPG Diffusor	BASS Trap	Bass trap	Class A	23 63"x23 63"x12 25"	Designed to handle modal problems in rooms with 8' to 9' ceilings; maximum efficiency between 70-80 Hz	\$538 (for two)
RPG Diffusor	ProFoam	Absorbing foam panel	Class A melaflex or Class B/C polyflex	24x24x2", 48x24x2"	Employs VDAC technology	Polyflex \$2.31 (per square foot) MelaFlex \$5.07 (per square foot)
RPG Diffusor	RFZ Ablector	Absorbing panel	Class A	19x47.25x6"	Broadband reflection control; improves imaging	(4) \$541.80
RPG Diffusor	Skyline	Diffusor	Class A	23 63x23 63x7"	Omnidirectional; primitive root diffusor, ideal for small rooms	(2) \$270.90



# SONIC TREATMENT

Manufacturer	Model	Type	Fire Rating	Dimensions	Special Features	Price
RPG Diffusor	SoundCorner	Bass Trap	Class A	48x24x2"	Absorbs lower frequencies from 150–300 Hz	(4) \$248.64
Silent Source	SoundSucker	Corner bass traps	Class A, Class C	12x48"	Available in charcoal, beige, brown, blue, red, purple, and yellow, 8 units per box, deliv incl	\$200
Silent Source	Whisper Wedge	Absorptive foam	Class A, Class C	24x48", 2", 3", 4", and 6" thick	Many colors to choose from; 2–12 sheets per box (16–96 sq ft), Class 1 available	(box) \$160–\$250
Systems Development Group	Cutting Wedge 2000	Absorptive foam	Available upon request	Varies	Sawtooth pattern across face and back for easy stacking	Starts at \$2.63 (per square foot)
Systems Development Group	Cutting Wedge Classic	Absorptive foam	Available upon request	Varies	Sawtooth pattern for greatest absorption per sq ft, tear-resistant w/shape memory	Starts at \$2.63 (per square foot)
Systems Development Group	Model C	Diffusor	Full Class A	23x23x4.5"	Install on wall or drop into 24"x24" opening of a T-bar grid, available with center cutout for recessed lighting fixtures	\$130
Systems Development Group	Model C-styrene	Sonic treatment	Full Class A	23x23x4.5"	Easy install on wall or drop into 24"x24" opening of a T-bar grid; available with center cutout for recessed lighting fixtures	\$87
Systems Development Group	Model E	Diffusor	Available upon request	15x15x9"	Small footprint, lightweight, simple install	\$55
Systems Development Group	Model F	Acoustic diffusor	Full Class A	2x24x1.75"	Specialized high-frequency diffusion	\$87
Systems Development Group	Model F-styrene	Acoustic diffusor	Non-fire rated	2x24x1.75"	Specialized high-frequency diffusion	\$87
Systems Development Group	Sonora Panel	Absorptive fiberglass	Class A	Up to 48x120x2"	Molded fiberglass board with nonresin chemically hardened edges wrapped in Guilford fabrics, panel edges	Varies
Taytrix	Absorptive Panels	Absorptive panels	Class 1	24x24", 24x48", 24x72"	Fiberglass absorption panels trimmed with decorator fabrics	Starts at \$129
Taytrix	Stack It Gobo System	Gobo	Class 1	16x8x48", 32x8x48"	Stackable, lightweight, modular, interlocking control panels can be used independently, joined at any angle, or assembled into booths	\$300–\$445
Wenger	Ceiling Diffusor	Acoustical panels	Class A	24x24", 48x24", 48x48"	Convex shape, impact-resistant PVC/acrylic plastic	(24x24") \$84 (48x48") \$181 (48x24") \$119
Wenger	Pyramidal Diffusor	Acoustical panels	Class A	24x24", 48x48"	Offset pyramid shape, impact-resistant PVC/acrylic plastic	(24x24") \$52 (48x48") \$147
Wenger	Quadratic Diffusor	Acoustical panels	Class A	48x48", 7 wells per sequence (largest sequence: 4 sequences per panel: 3)	Based on quadratic theory, effective over frequency range of 750 Hz–3.3 kHz; impact-resistant PVC/acrylic plastic	\$424
Wenger	Trapezoidal Diffusor	Acoustical panels	Class A	24x24", 48x48"	Offset trapezoid shape; fiberglass resin with white gel-coat finish	(24x24") \$92 (48x48") \$147
Wenger	V-Room	Sound-isolating, modular studio with active acoustics (LARES-based)	Class A	From 5'8"x5'8" to 10'8"x13'2"	Provides acoustical simulations of 10 different environments	Starts at \$14,697
Wenger	Wall Diffusor	Acoustical panels	Class A	48x48", 48x96", other sizes available	Convex shape, PVC/acrylic plastic with reinforced corners and fabric covering	(48x48") \$249 (48x96") \$514
Whisper Room	SE Series	Sound-isolation enclosures	N/A	Various standard sizes available	Portable; modular, easy assembly; cable passage; ventilation system; door window; optional wall windows and caster plates	Starts at \$2,195

# STUDIO FURNITURE

Manufacturer	Product	Type	Dimensions (Inches)	Special Features	Price
Anthro	Console	Workstation for non-linear video editing, mixing, and post production	72x23.5x37	Holds three 21" monitors; kybrd area adj for sitting or standing; shelves adj in 1" incr; lifetime warr	\$899
Anthro	Rack Workstation	RackCart workstation with 9 units of rack	60x28x24	Combines workstation and 9 units of rack area; lifetime warr	\$889
Anthro	RackCarts	RackCart	13U, 17U, 21U, 29U sizes	Rack-mounting on tapped mounting rails front/back; rack accessories avail	\$719-\$929
Anthro	SlantRacks	RackCart for mounting 19" rack equipment	9U, 13U, 21U sizes	Rack-mounting on tapped mounting rails front/back; tilted for easier vis of rack equip	\$319-\$429
Argosy Console	90 Series Console Housing	For Mackie 8-Bus, Yamaha 02R, Soundcraft Ghost, Digidesign ProControl mixers	89.5-178x45x39	Exp encl w/full padded armrest, multiaccess bridge lids	Starts at \$1,529
Argosy Console	Dual 15	Workstation for digital-based rec/mix/post systems	94x50x43	Holds two 21" computer monitors; 38 rackspaces	\$1,199
Argosy Console	Dual 15K	Workstation for keyboard-based systems	94x50x43	Holds two 21" computer monitors; 38 rackspaces	Standard \$1,199
Argosy Console	Nevis Console Housing	For Mackie 8-Bus, Yamaha 02R, Soundcraft Ghost, Panasonic DA-7, Mackie Digital 8-Bus	68.2x44x30	True enclosure with full padded armrest, multi-access bridge lids	\$699.95-\$819.95
Argosy Console	Spire Rack Enclosures	Single, double, and quad 14-rack bay	22.7-82.25x33x24	Frame panel construction w/removable access doors	Starts at \$299.95
Argosy Console	Spire Speaker Stands	42" speaker stand	Base: 16x16; Top: 12x12	For close-field monitoring	(single) \$54.95 (pair) \$99.95 (three) \$139.95
Bryco Products	CD60, CDB60	Solid oak CD rack	21.5x11x4.75 (natural and black)	Wall or table mount; holds 60 CDs	\$59.95
Bryco Products	CDP-63	Thick plastic CD rack	15.75x13.88x4.25	Wall or table mount; holds 63 CDs	\$21.95
Bryco Products	CP-48	Cassette tape storage rack	18.5x11.5x2	Wall or table mount; holds 48 cassettes	\$21.95
Bryco Products	DR-60 Datrax, DRB-60 Datrax	DAT holder; solid oak (natural and black)	21.25x9.5x2	Wall or table mount; holds 60 DATs	\$59.95
Bryco Products	DRP-40	DAT holder	17.4x7.4x2	Wall or table mount; holds 40 DATs	\$21.95
Bryco Products	DSD-320	DAT storage cabinet	19.5x21.75x15.5	Stores 320 DAT	\$349
Bryco Products	MD-80	MiniDisc holder	17.38x7.38x2	Wall or table mount; holds 80 MiniDiscs	\$21.95
Bryco Products	V8-36; V8-36 Pro	8 mm tape storage rack	V8-36: 17.5x10.25x2.38 V8-36 Pro: 18.25x9.63x2.19	Wall or table mount; holds 36 tapes	\$21.95
Littlite	Task Lamp	Task lamp	6", 12", or 18" goosenecks	Flexible task lamp avail in 5W or 2.5W	\$25-\$160
Littlite	Gooseneck Lamps	Workstation for digital-based recording/mixing/post systems	94x50x43	Holds two 21" computer monitors; 38 rackspaces	\$1,199
Omnirax	C2	Keyboard composing/audio-video workstation	45.8x43.4x107.25	Holds keyboard, two comp monitors, close-field monitors, comp kybrd; 58 rackspaces	\$1,599.95
Omnirax	Coda	Digital editing/mixing workstation	38.8x38.5x67.9	For cmprtr and prphrls; inspired by Mackie's HUI; also fits Yamaha 03D and other compact mixers/controllers; 8 rackspaces	\$749.95
Omnirax	Coda D8	Mixing workstation	38.5x36.6x71.38	Workstation for Mackie Designs' Digital 8-bus mixer and peripherals	\$799.95
Omnirax	Coda EX	Mixing workstation	36.8x40.38x71.38	Expanded Coda: platform for digital mix/edit environments	\$849.95
Omnirax	Commander	Keyboard; composing/mixing workstation	48x44.5x87.3	Holds up to 88-note keyboards w/room for computer and near-field monitors; 60 rackspaces	\$1,299.95
Omnirax	CW-22	Rolling studio rack	50.5x23.75x20.6	22 rackspaces; 8 vertical below, 14 slanted above	\$274.95
Omnirax	CW-30	Rolling studio rack	36.5x36.5x20.6	14 rackspaces on sloping top, 10 rackspaces below, 6 lower rear	\$299.95
Omnirax	E-146	Rolling studio rack	30x26x20.6	Slant rolling rack; 14 spcs front, 6 spcs lower rear	\$209.95
Omnirax	Fusion	Keyboard composing workstation	39x54x93.75	Holds 88-note keyboard w/3 rack bays; Riser Bridge positions near-field monitors to sweet spot; sliding shelf holds 2 video monitors; 69 rackspaces	\$1,550
Omnirax	M8	Mixing workstation	45.5x36x40.5	Fits Mackie 24-8 mixer; 8 total rackspaces	\$399.95
Omnirax	MiniStation	Compact keyboard/computer workstation	39.75x30x48	Holds keyboards up to 46.5" wide; space for computer, kybrd/writing shelf; 6 rackspaces	\$669.95
Omnirax	MixStation MAK24•8	Console workstation for Mackie 24-8 bus mixer	43x38x81.5	Multilevel wrking environment for Mackie 24-8 mixer, computer, and prphrls; 42 rackspaces	\$1,199.95
Omnirax	MixStation MAK32•8	Console workstation for Mackie 32-8 bus mixer	43x38x90.5	Multilevel working envrnmnt for Mackie 32-8 mixer, computer, and prphrls; 42 rackspaces	\$1,249.95



# STUDIO FURNITURE

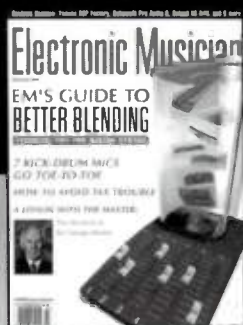
Manufacturer	Product	Type	Dimensions (Inches)	Special Features	Price
Omnirax	MixStation 02R	Console workstation for Yamaha 02R	43x38x70.5	Multilevel working environment for Yamaha 02R mixer, computer, and peripherals; 42 rackspace	\$1,199.95
Omnirax	Mobi	Mobile computer workstation	55.5x28.75x20.6	Room for 14" monitor, CPU, and computer keyboard; 10 rackspace	\$399.95
Omnirax	Pro-20	Rolling studio rack	45x18x20.6	Versatile slant front, 20-spc rolling rack	\$239.95
Omnirax	Pro-316	3-bay producer's studio rack	34.25x27.75x62	Rolling rack; 48 rackspace in 3 slanted bays of 16 spcs; large top surface area	\$599.95
Omnirax	Producer's Corner	5-piece audio/video suite	36.2x37x120.6	Workstation suite for audio/video editing; holds multiple video monitors & close fields; 28 rackspace; enclosed CPU spc	\$1,299.95
Omnirax	ProStation	Digital audio workstation	44x36x2.25	For computer and close-field monitors; 30 rackspace	\$899.95
Omnirax	ProStation Junior	Digital audio workstation	42.5x29.5x60.5	For computer and close-field monitors; 14 rackspace	\$699.95
Omnirax	ProStation Junior M/C	Keyboard composing workstation	43x29.5x60.5	Compact workstation for keyboard composing; holds computer and close-field monitors; 12 rackspace	\$659.95
Omnirax	ProStation M/C	Keyboard composing/ mixing workstation	45.5x36x72.25	For mixing boards or keyboard composing; Holds computer and close-field monitors; 26 rackspace	\$849.95
Omnirax	Sidecars D8/EX	Sidecar	38.5x39.38x36	Sidecars attach directly to the Coda D8 or EX; avail in left or right-handed	\$399.95
Omnirax	Sidekick	Rolling workstation	44x24.9x20.6	13 rackspace and space for controllers and peripherals	\$324.95
Omnirax	Synergy Series Consoles	Synergy 600, Synergy 800, Synergy 1000 console workstation for multiple mixers	41.63x42x101.6" (124 wide)	Fits Mackie, Yamaha, Soundcraft, Ramsa, and other mixers in single/multiple configs; padded wrist rest; minimum 12 rackspace	\$900-\$1,800
Omnirax	Synthrax 88	Multiple keyboard housing and 30 rackspace	49x24x60.5	Holds three 88-note synths on sliding, locking shelves; 30 rackspace	\$824.95
Omnirax	Tyro	Ultracompact keyboard/computer workstation	34x23.75x45.25	For keyboards up to 43" wide; piano shelf and computer keyboard slide out and lock in place; 12 rackspace	\$624.95
Per Madsen Design	Rackit System 19; Cassette 19; and Cassette 19-10 units	Media storage drawers	15 or 10x20.75x16	Modular, stackable oak drawer units hold standard, DAT, 8mm cassette, MiniDisc and floppy disk	\$225-\$295
Per Madsen Design	Rackit System 19 CD/DVD/VHS 19 unit	Media storage drawers	15x20.75x16	Modular, stackable oak drawer units hold CD, DVD, MiniDisc, Zip, and VHS	\$245-\$265
Per Madsen Design	Rackit System 19; Component Rack 19; Rail-10 (5U), 19 Rail-15 (8U), 19 Rail-30 (16U)	Equipment racks with mounting rails	10", 15", or 30x20.75x16 (in EIA standard 5-, 8-, and 16-unit sizes)	Modular, stackable oak equip racks	\$100 \$115 \$165
Per Madsen Design	Rackit System 19 Component Rack 19-5, 19-7.5, 19-10, 19-15	Equipment rack with shelves	5", 7.5" or 10", 15x20.75x16	Modular, stackable oak equip racks	\$80 \$85 \$95 \$100
Per Madsen Design	Rackit System 19; Dolly 19	Dolly for all Rackit System 19 units	4x20.75x16	4 twin-wheel casters; 300-lb rolling load	\$55
Quik-Lok	A-50	Height-adjustable tripod studio boom stand w/locking casters	Height adjustment 53.5-91.5, boom length 46.5-87"; folded height 53.8"	Tripod leg design w/solid steel legs; holds all kinds of mics, locking casters; 7" boom; mic cable clips	\$179.95
Quik-Lok	BS-336	36" fixed-height near-field studio monitor stand	Shelf 11" square; height 36"; base 17.7" each side; weight capacity 125 lbs	All-steel, arc-welded construction; cable management; triangle base w/adj leveling floor spikes; rubber-padded top plate	pair \$149.95
Quik-Lok	BS-342	42" fixed-height near-field studio monitor stand	Shelf 11" square; height 42"; base 17.7" each side; weight capacity 125 lbs	All-steel, arc-welded construction; cable management; triangle base w/adj leveling floor spikes; rubber-padded top plate	\$159.95
Quik-Lok	Z-250	Triple-shelf computer workstation	Approximately 33.6x29.8x22.3	3 surface workstations with large rectangular main shelf; holds all kinds of computer equipment/access	\$319.95
Quik-Lok	Z-544	Z500 Series Expandable Music Project Station (44" wide)	Approximately 64.6x40.1x27.5	Many options; holds computer peripherals, speakers, rack equipment, keyboards, mixers, etc.; shelves and crossbars height-adjustment; 3/4" laminate work surfaces	\$279.95
Quik-Lok	Z-555	Expandable music project station (55" wide)	Approximately 55-75.6x28.75x35.4	Many options; all shelves and crossbars are height adjust; computer-welded steel frame; 3/4" laminate surfaces	\$299.95
Quik-Lok	Z-750L	Triple-shelf computer workstation with 45-degree	Approximately 52.8x28.9x22.3	3 surface; large left-angled main shelf; scratch-resistant 3/4" laminate shelves; steel frame	\$349.95
Quik-Lok	Z-750R	Triple-shelf computer workstation with 45-degree right-angled main shelf	Approximately 28.9x52.8x22.2	3 surface workstation w/large right-angled main shelf; scratch-resistant 3/4" laminate shelves; steel frame	\$349.95
Rackcraft	Desktop Studio Rack	Black laminated melamine board; T-mold edging	25.5x29x48.16	Desktop; 20 rackspace; ideal for Mackie ADAT studio w/FX and monitors	\$299

# STUDIO FURNITURE

Manufacturer	Product	Type	Dimensions (inches)	Special Features	Price
Shedworks	Modular Workstations	Modular workstations	22x28x24 rolling racks; 60" or 72" tabletops	All systems custom configured	\$500-\$2,500
Taytrix	Counter Top	Countertop	Varies	Straight, angle wing, corner units	Starts at \$35 (sq. ft.)
Taytrix	Oval Workstation	Workstation	6.5 and 5 Mini ovals 60" and 78"	Adjustable meter bridge shelf; 180-degree swivel speaker wings; rack packages also available	Starts at \$2,875
Taytrix	Rack Units	12-, 14- and 16-rackspace units	29.5-32x16.5-23; fits 19" standard gear	Available in square-front or unique front-angle design; maple or cherry furniture-grade plywood	Starts at \$300; countertop racks start at \$117
Ultimate Support	HS26BP	Studio-organizer stand	Floor space: 19x38; surface: 16x35.5	Large work surface, center tier and side, arms support gear; many accessories available	\$268
Ultimate Support	HS36BP	Studio-organizer stand	Floor space: 17x45; surface: 16x18	Versatile design; acrylic work surface; side optional (HE48B, \$135.50); accessories avail	\$322
Ultimate Support	MS36	Studio-monitor stand	Height: 36", top plate 9"x9", triangle base diameter: 14"	Cable management, triangle cast-zinc base; available in silver, black, and pewter	(pair) \$210
Ultimate Support	MS45	Studio-monitor stand	Height: 45", top plate 9"x9", triangle base diameter: 14"	Cable management, triangle cast-zinc base; avail in silver, black, and pewter	(pair) \$230
Wenger	Workstation	Computer/synthesizer workstation	48x37x32	Cockpit like design; steel and wood frame; cord-management system conceals cables and power cords; 15-outlet AC strip	\$1,056

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# POWER PRODUCTS

Manufacturer	Model	# of Receptacles	Output Current/Load Rating	Maximum Surge Current Rating	Spike Protection Modes/# of MOVs	Spike Response Time	Line Regulation	Balanced Power	Rack Mount/# of Spaces	UPS Y/N
APC	APC Back-UPS Pro 350	7	350 VA/220W	320 Joules, 6500A	N/A	Instant	Automatic	No	No	Yes
APC	APC Back-UPS Pro 500	7	500 VA/315W	320 Joules, 6500A	N/A	Instant	Automatic	No	No	Yes
APC	Back-UPS Office	6	280 VA/170W	320 Joules	N/A	Instant	N/A	No	No	No
APC	Back-UPS Pro 420	6	420 VA/260W	320 Joules	N/A	Instant	Auto volt reg	No	No	Yes
APC	Back-UPS Pro 650	6	650 VA/410W	320 Joules	N/A	Instant	Automatic	No	No	Yes
APC	SurgeArrest (personal)	3 or 7	<300V	240 Joules	N/A	Instant	No	No	No	No
Equi-Tech	ET1R Balanced Power Rack System	12	10A/120V	240 Joules	Line-neutral; line-ground; neutral-ground/4	N/A	No	Yes	Yes/2	No
Furman	PL-8	9 (1 front, 8 rear)	15A/120V	6,500A	Line-neut; neut-ground; line-ground/3	1 ns	No	No	Yes/1	No
Furman	PL-Plus/PRO Series	9 (1 front, 8 rear)	15A (20A PRO)/120V	6,500A	Line-neut; neut-ground; line-ground/3	1 ns	No	No	Yes/1	No
Furman	PL-Tuner Power Conditioner and Instrument Tuner	9 (1 front, 8 rear)	15A/120V	6,500A	Line-neutral; neutral-ground; line-ground/3	1 ns	No	No	Yes/1	No
Juice Goose	JG 8.0	8	15A/120V 1,800W	N/A	1/1	N/A	No	No	Yes/1	No
Juice Goose	JG 8.0LM	8	15A/120V 1,800W	N/A	1/1	N/A	No	No	Yes/1	No
Juice Goose	JG Junior	6	15A/120V	N/A	Line-neutral/1	1 ns	No	No	Yes/1	No
New Frontier	Surge-X SX115R	8	15A/120V	Unlimited	U.S. government mode 1/0	Instant	No	No	Yes/1	No
New Frontier	Surge-X SX115RL	8	15A/120V	Unlimited (8x20 ns)	U.S. government mode 1/0	Instant	No	No	Yes/1	No
New Frontier	Surge-X SX115RT	8	15A/120V	Unlimited (8x20 ns)	U.S. government mode 1/0	Instant	No	No	Yes/1	No
New Frontier	Surge-X SX15-IR2	2	15A/120V	Unlimited (8x20 ns)	Mode 1/0	Instant	No	No	No	No
New Frontier	Surge-X SX1808	8	15A/120V	Unlimited (8x20 ns)	Mode 1/0	Instant	No	No	No	No
New Frontier	Surge-X SX20-IR2	2	15A/120V	Unlimited (8x20 ns)	Mode 1/0	Instant	No	No	No	No
New Frontier	Surge-X SX202R	12	40A/120V	Unlimited (8x20 ns)	Mode 1/0	Instant	No	No	Yes/2	No
New Frontier	Surge-X SX2120	15	15A/120V	Unlimited (8x20 ns)	Mode 1/0	Instant	No	No	Yes/2	No
New Frontier	Surge-X SX908	8	7.5A/120V	Unlimited (8x20 ns)	Mode 1/0	Instant	No	No	No	No
Panamax	Max 1000+ Surge Protector/Line Conditioner	8	15A/120V	40,000A	Line-neutral; line-ground; neutral-ground/7	Instant	No	No	Yes/1	No
Panamax	Max 1500 Surge Protector/Line Conditioner	10	15A/120V	40,000A	Line-neut; line-ground; neutral-ground/7	Instant	No	No	Yes/2	No
Panamax	Max 2000 Programmable Power Control System	10	15A/120V	40,000A	Line-neut; line-ground; neutral-ground/7	Instant	No	No	Yes/2	No
Tripp Lite	Isobar 12 Rackmount Surge Suppressor	12	15A/12V	750 Joules	Line-neut; neut-ground; line-ground	Instant	No	Yes	Yes/1	No
Tripp Lite	Isobar 4 Ultra Surge Suppressor	4	12A/120V	220 Joules	Line-neut; neut-ground; line-ground	Instant	No	Yes	No	No
Tripp Lite	Isobar 6 DBS Surge Suppressor	6	12A/120V	2850 Joules	Line-neut; neut-ground; line-ground	Instant	No	Yes	No	No
Tripp Lite	Isobar 4 Ultra Surge Suppressor	4	12A/120V	2700 Joules	Line-neut; neut-ground; line-ground	Instant	No	Yes	No	No
Tripp Lite	LC 1800 Line Conditioner	6 NEMA 5 - 15 R	15A/120V	600 Joules	Line-neut; neut-ground; line-ground	Instant	87-140V	Yes	No	No
Tripp Lite	LC 2400 Line Conditioner	6	20A/120V	600 Joules	Line-neut; neut-ground; line-ground	Instant	87-140V	Yes	No	No
Tripp Lite	LS 600 Line Conditioner	2	5A/120V	100 Joules	Line-neut; neut-ground; line-ground	Instant	87-120V	Yes	No	No

EMI & RFI Filtering: Filter/Capacitor	Voltage Meter: Analog or Digital	Lights #/Type	Battery Backup	Warranty (Years)	Dimensions (Inches)	Weight (pounds)	Special Features	Price
EMI/RFI	Digital	4/LED	Yes	2	9.4x5x7.9	14.2	USB port, file svng stwr, 2-line phone/fax/modem surge support	\$299.99
EMI/RFI	Digital	4/LED	Yes	2	9.4x5x7.9	15.35	USB port, file svng stwr, 2-line phone/fax/modem surge support	\$299.99
Filtering	N/A	2/LED	Yes	2	2.7x17x7	8	\$25,000 lifetime warranty	\$199.99
Filtering	Digital	4/LED	Yes	2	6.6x4.7x14.5	21.6	N/A	\$339
EMI/RFI	Digital	4/LED	Yes	2	6.6x4.7x14.5	26	\$25,000 lifetime warranty	\$419
EMI/RFI	N/A	2	No	Lifetime	3-outlet: 2x4.25x6.25, 7-outlet: 2x4.25x10.5	0.7 1.7	Optional telephone/cable line surge support	(3-outlet) \$24.95 (7-outlet) \$29.95
Filter optional	N/A	N/A	No	3	16x12.5x3.5	36	More than 5 custom models available	\$879
Capacitor	N/A	2/slide-out with dimmer	No	3	1.75x19x8	6	Triple-mode varistor spike/ surge protector, circuit breaker	\$159
Filter	Analog	2/slide-out with dimmer	No	3	1.75x19x8	6	Triple-mode varistor spike/surge protector, extreme voltage shutdown, "smart" microprocessor	(PL-Plus) \$229 (PRO) \$399
Filter	N/A	2/slide-out with dimmer	No	3	1.75x19x8	6	Guitar/bass tuner, auto triple-mode "Lock On", sharp/flat lights emulate "beats"	\$279
Filter/Capacitor	N/A	N/A	No	3	1.75x19x7	5		\$79
Filter/Capacitor	Analog	2/pull-out	No	3	1.75x19x7	6		\$182
Capacitor	N/A	N/A	No	1	1.75x19x4.5	4	On/off switch	\$59
Adv imped tol filter	N/A	N/A	No	10	1.75x19x8	9	6 switched/2 unswitched, magnetic shield, grade A/class 1, self-test	\$459
Adv impedance tolerant filtering	N/A	2/Little "R" receptacle with dimmer	No	10	1.75x19x3	9	6 switched/2 unswitched, magnetic shield, grade A/class 1, self-test	\$499
Adv impedance tolerant filtering	N/A	N/A	No	10	1.75x19x8	9	6 switched/2 unswitched, magnetic shield, grade A/class 1, self-test	\$459
Yes	N/A	N/A	No	10	3.2x7.8x3.75	5	2 receptacles on front, magnetic shield, grade A/class 1	\$279
Yes	N/A	N/A	No	10	3.8x8.5x4	6	6 switched/2 unswitched receptacles, magnetic shield, self-test	\$299
Yes	N/A	N/A	No	10	3.2x7.8x3.75	5	2 receptacles on front panel, magnetic shield, grade A/class 1, self-test	\$339
EMI/RFI filter	N/A	N/A	No	10	3.5x19x8	16	Magnetic shield, grade A/class 1, self-test	\$699
Adv impedance tolerant filtering	N/A	N/A	No	10	3.5x19x8	16	Front panel receptacles, magnetic shield, grade A, class 1, self-test	\$599
Yes	N/A	N/A	No	10	3.8x8.5x4	6	Magnetic shield, self-test	\$239
Enhanced 2-stage filter	Analog, digital	5	No	Lifetime	7.31x17.14x1.94	6.43	Under/over volt protection, thermal fuse, remote sensing, delayed on/off	\$299
Enhanced 2-stage filter	Analog, digital	5	No	Lifetime	3.5x17.14x7.31	11.44	AllPath compatible: remote sensing for power on/off, delayed on/off, over/under volt protection	\$449
Enhanced 2-stage filter	Digital	N/A	No	Lifetime	17.25x3.5x8.5	11.44	Programmable on/off sequence, 6 gold coaxial, optional AllPath protect models, under/over volt protection	\$849
Yes	N/A	N/A	No	Lifetime	1.75x17.5x4	4.5	Metal housing, isolated filter banks	\$149
Yes	N/A	N/A	No	Lifetime	2.5x6x3.5	2.38	Metal housing, isolated filter banks	\$42.75
Yes	N/A	N/A	No	Lifetime	2.5x7x3.5	3.6	2 sets type F coaxial jacks, RJ11 telephone jacks, metal housing, isolated filter banks	\$57.50
Yes	N/A	N/A	No	Lifetime	2.5x6x3.5	3.03	Metal housing, isolated filter banks, RJ11 telephone jacks	\$52.50
Yes	N/A	N/A	No	2	6.75x6x6.75	11.5	Isolated filter banks	\$299
Yes	N/A	N/A	No	2	6.75x6x6.75	14	Isolated filter banks	\$399
Yes	N/A	N/A	No	2	6x5.75x5	7.5	N/A	\$129



# POWER PRODUCTS

Manufacturer	Model	# of Receptacles	Output Current/Load Rating	Maximum Surge Current Rating	Spike Protection Modes/# of MOVs	Spike Response Time	Line Regulation	Balanced Power	Rack Mount/# of Spaces	UPS
Tripp Lite	LS 604 Line Conditioner	4 NEMA 5 - 15 R	5A/120V	300 Joules	Line-neut; neut-ground; line-ground	Instant	87-140V	Yes	No	No
Tripp Lite	Smart 450 Net UPS	6	3.75A/120V	360 Joules	Line-neut; neut-ground; line-ground	Instant	86-145V	Yes	No	Yes
Tripp Lite	Super 7 Coax Surge Suppressor	6	15A/120V	120 Joules	Line-neut; neut-ground; line-ground	Instant	N/A	Yes	No	No
VanEvers	Balanced Clean Line Basic	4	600W	N/A	N/A	N/A	No	Yes	3 (optional)	No
VanEvers	Balanced Clean Line Artist	4	600W	28,000A	Line-neutral; neutral-ground/3	<15 ns	No	Yes	3 (optional)	No
VanEvers	Clean Line Junior Model 11 Analog	1	1,800W	N/A	N/A	N/A	No	No	No	No
VanEvers	Clean Line Model 141	14 (8 analog, 6 digital)	1,800W	28,000A	Line-neut; neut-ground/5 (2 gas surge arrest)	<15 ns	No	No	Yes/2	No
VanEvers	Clean Line Model 141-Special	8	4 x 1,800W	28,000A	Line-neut; neut-ground/8 (8 gas surge arrest)	<15 ns	No	No	Yes/2	No
VanEvers	Clean Line Model 83	8 (6 analog, 2 digital)	1,800W (240W digital)	28,000A	Line-neut; neut-ground/3 (2 gas surge arrest)	<15 ns	No	No	Yes/2 (optional)	No

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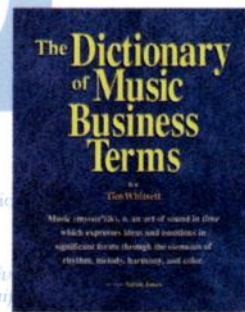
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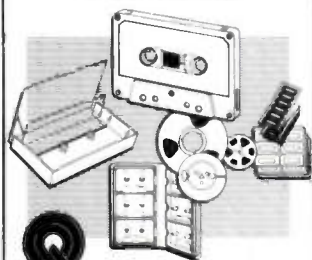
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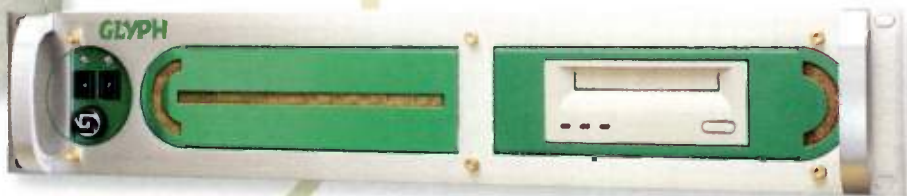
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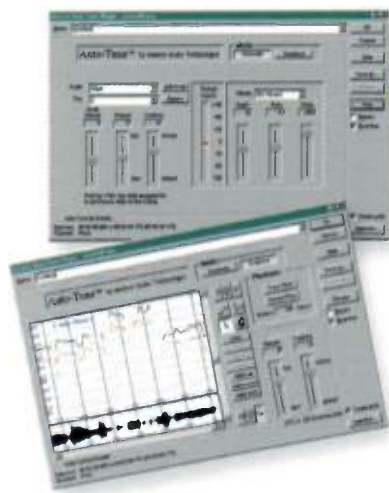
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"Holy Grail of recording"—Recording Magazine



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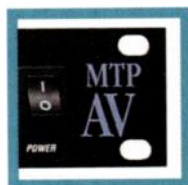
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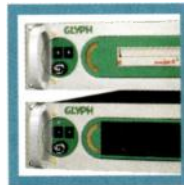
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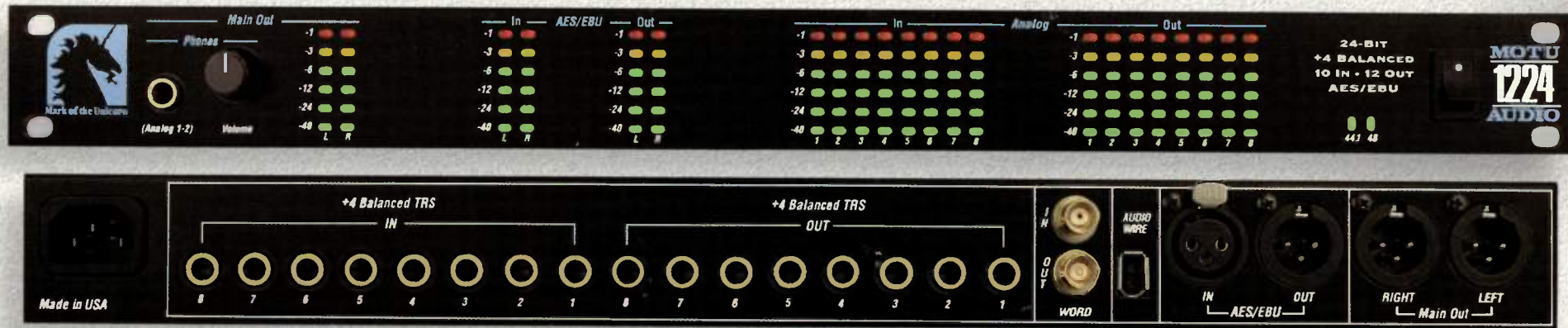
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