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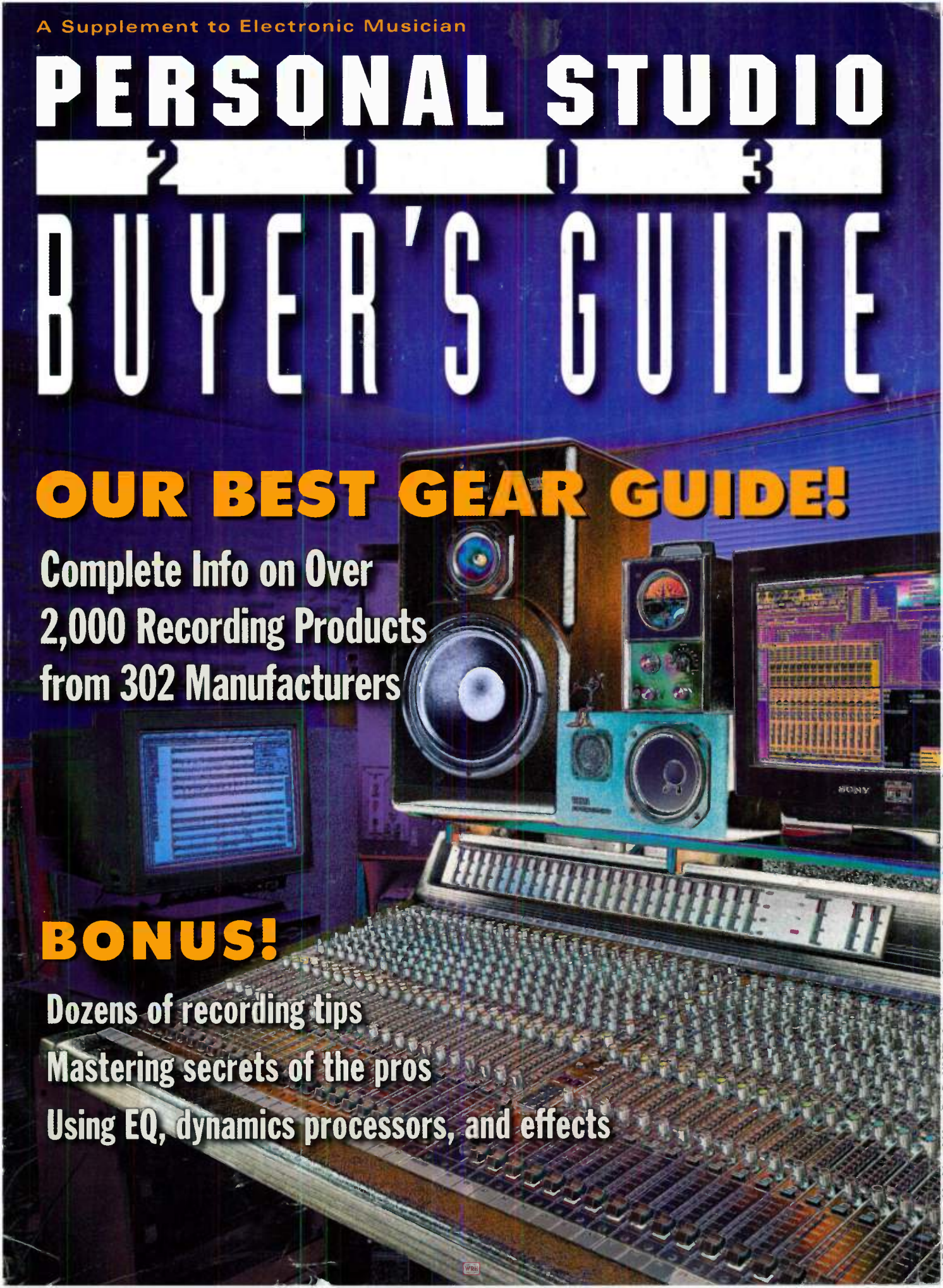

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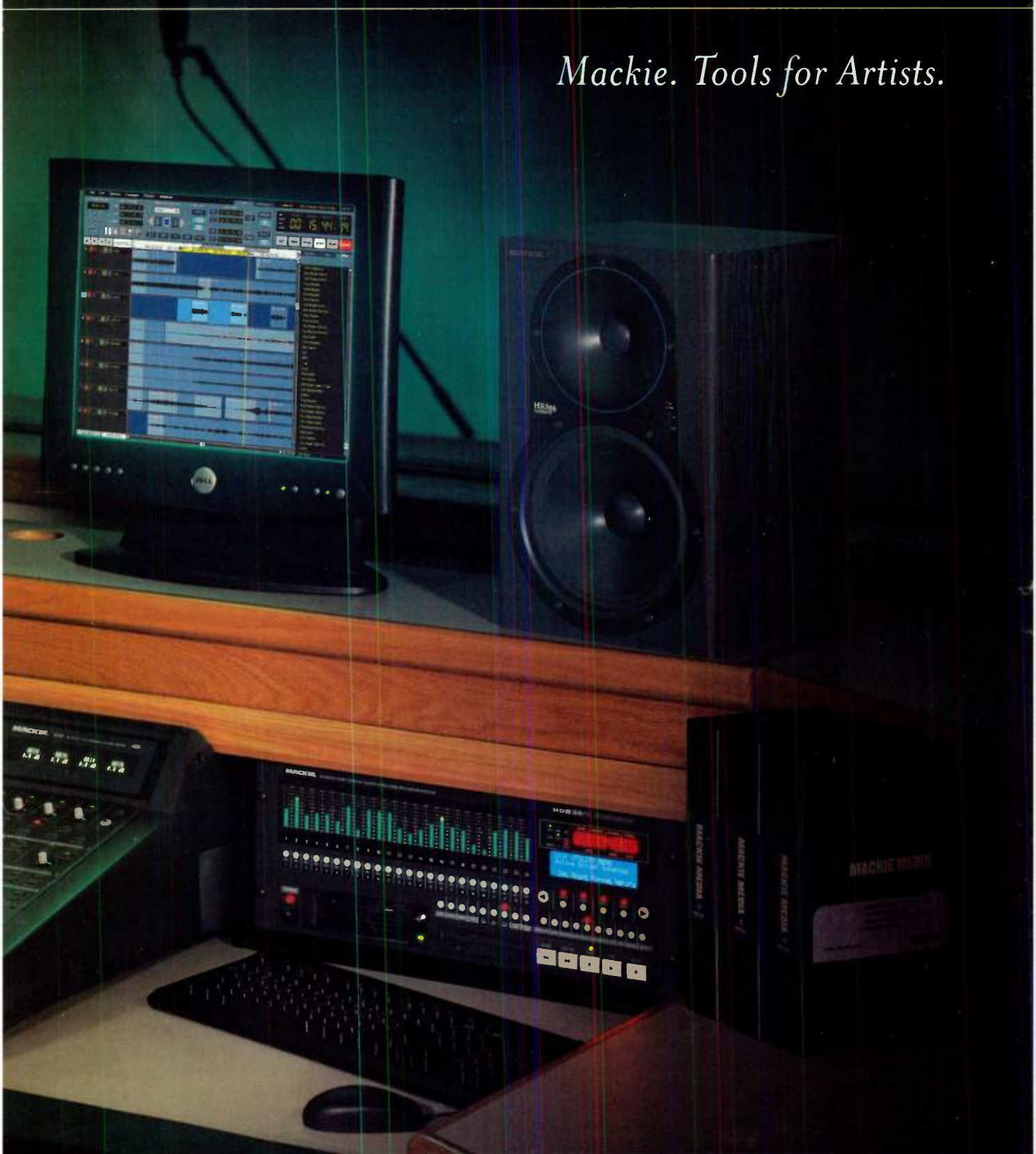

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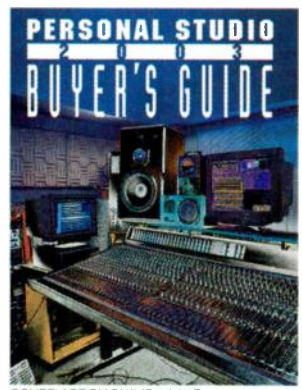

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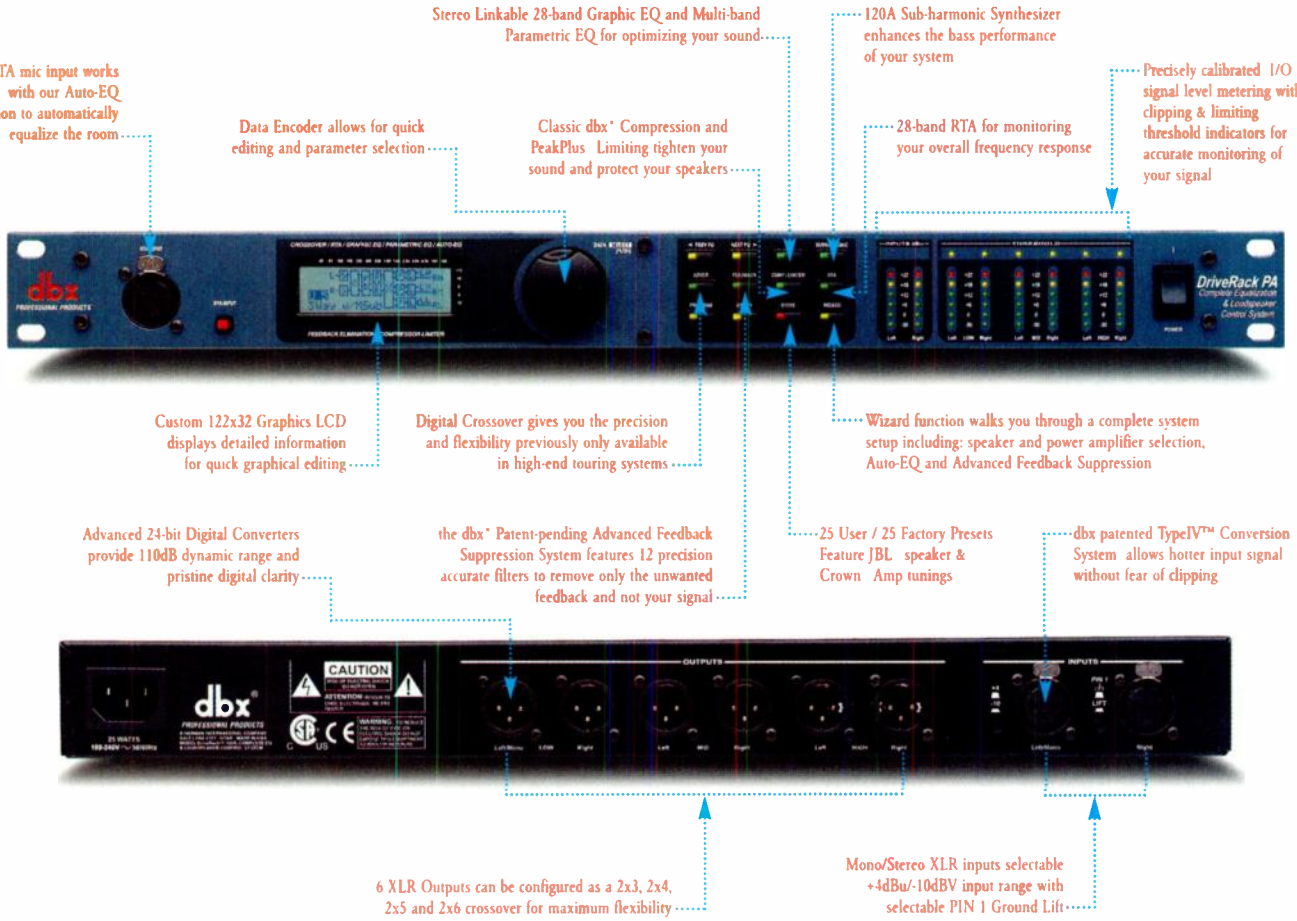
THE CHARTS

The Cure for the Common PA



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PERSONAL STUDIO 2003 BUYER'S GUIDE

Welcome to the sixth edition of *Electronic Musician*'s *Personal Studio Buyer's Guide*. We understand that, as subscribers to EM, you can never get enough information about gear; in fact, some of you would prefer that we devote the entire magazine to nothing else! Well, in a sense, that's just what we've done with PSBG. Within these pages, you'll find information on thousands of products from hundreds of manufacturers, all organized into 28 easy-to-use charts.

One of those charts, Portable Digital Studios, is new this year. These multifunction devices combine all of the essential studio components—a recording mixer, a (hard-disk) recorder, effects and dynamics processors, and, in some cases, editing and mastering facilities—in a single package. Many even contain CD writers, allowing you to record, mix, and master your project without any additional gear.

But PSBG doesn't simply provide you with information about particular pieces of gear; it also helps you understand how to use gear more effectively. For example, getting several pieces of equipment to work well together—be they analog, digital, or a combination of the two—can sometimes be like translating between people who don't speak the same language. Dan Phillips delivers the authoritative word on word clock, SMPTE, MTC, and other forms of synchronization—in fact, just about everything but the kitchen sync—in his feature story "Get in Sync."

This year's PSBG gives you lots of tips on topics such as how to use equalization and effects processors more effectively. In "Instrument-Specific EQ Tips," Bobby Owsinski explains how to shape snare drum *snap* and *boing*, cymbal *sparkle* and *clang*, and other audio characteristics using EQ; in "Magic Frequencies," he identifies six frequencies that are key to controlling sonic qualities such as *honk*, *whack*, and *thump*. There are also pieces by recording instructor and best-selling author Bill Gibson and by regular EM contributor Scott Wilkinson. Whether you are just getting started, or have been recording for years, there is something here for you.

We hope that you will find this latest edition of PSBG to be the best ever.

Barry Cleveland

Editor
Personal Studio Buyer's Guide

PERSONAL STUDIO 2003 BUYER'S GUIDE
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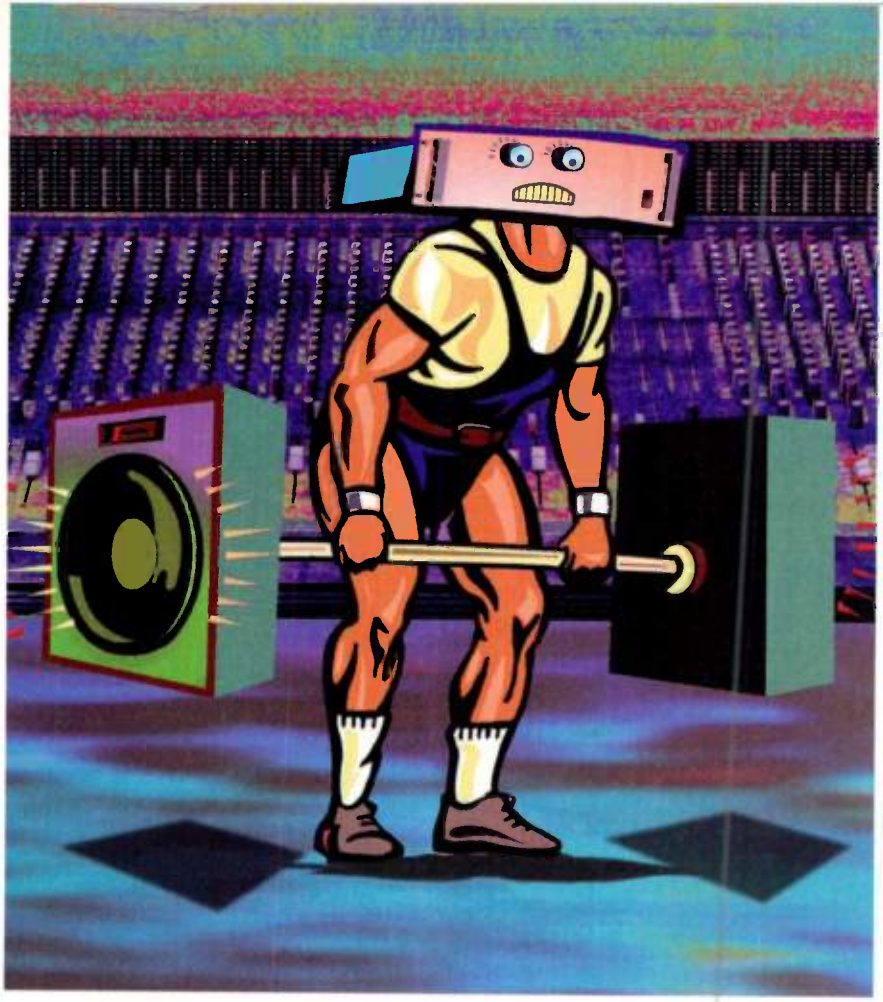

Power amps kick your music into high gear.

By Scott Wilkinson

As its name implies, a power amplifier is intended to boost the power of a signal. Typically, a power amp accepts a line-level signal and increases its voltage and/or current without changing the shape of the input waveform. The amplified signal is sent to a speaker, which converts the signal into acoustic sound waves.

Power amps are used in three primary applications: studio monitoring, sound reinforcement, and instrument amplification (e.g., guitar and bass). The general principles of all power amps are essentially the same. For the purposes of this article, we'll focus on studio amps, which typically amplify two channels from a mixer's main output and send them to speakers.

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POWER SUPPLY

Unlike most studio gear, a power amp draws some serious current from the AC outlet. This current is converted to DC by the power supply. (Virtually all electronic devices include a power supply that converts AC to DC in order to operate their internal components.) The first step in this process is performed by a *power transformer*, which increases or decreases the incoming AC voltage, depending on how much power the amp is meant to deliver. The AC voltage from the transformer is converted into a DC voltage by a set of diodes and several large capacitors.

One common type of power-amp transformer is called *toroidal* because it looks like a doughnut (a shape known as a toroid in mathematical circles; see **Fig. 1**). This shape is important because it confines the magnetic field of the transformer to its core, reducing leakage into the audio circuitry.

The DC voltage from the power supply is symmetrically arranged around the ground point (0V). For example, the output from the power supply might be ±50 VDC. These positive and negative voltages are called the *power-supply rails*, which are used to operate the amp's internal circuitry. In particular, they provide power to a set of *output transistors* that perform the actual amplification. (In early power amps, the job of the output transistors was performed by tubes, and some people still think tubes sound better than transistors. However, transistors are more durable and reliable.)

The output transistors amplify the input signal by drawing power from the capacitors in direct proportion to the input signal's voltage as it varies over time. As the capacitors discharge in this process, they are replenished by the transformer. The electrical capacity of these capacitors and the speed with which they are replenished are critical factors in the quality of the amp.

Most power amps use either *bipolar* or *MOSFET* (Metal Oxide Semiconductor Field Effect Transistor) output transistors. Bipolar transistors generally have a higher current capacity, which is especially important in a power amp. However, their impedance decreases as they get hotter, letting more current through, which heats them up even more, letting even more current through, and so on. This is called *thermal runaway*, which can quickly damage the transistors. As a result, most amps with bipolar transistors include thermal-protection circuitry.

MOSFETs are popular because they exhibit a very high input impedance. However, they exhibit significant gate capacitance, which can make their high-frequency performance unstable. This can be circumvented with good design, but it can be tricky. On the plus side, MOSFETs do not suffer from thermal runaway.

You often hear power amps labeled as Class A, B, or AB. In a Class A power amp, the output transistors handle both the positive and negative swings of the waveform. In Class B designs, one set of transistors handles the positive swings and another set handles the negative swings. This also applies to Class AB designs, but in these amps, there is some overlap as the signal changes polarity; when the signal is near 0V, both sets of transistors are conducting.

The power-supply rails determine the maximum amplitude that the amp can produce. For example, if the rails are at +50V and -50V, the amp can produce signals of nearly 100V peak to peak. If the amp tries to produce a signal that exceeds this limit, the tops and bottoms of the waveform are cut off; this is called *clipping*. Interestingly, the resulting distortion applies much higher average power to the speaker and generates severe high-frequency components that can be very damaging to tweeters. As a result, many amps include a *clipping* or *current limiter* to minimize this problem.

Some amp designs use multiple power-supply rails (see **Fig. 2**). When the peaks of the output signal are small to moderate, the low-voltage rails are used; most musical material falls within this range most of the time. When the output peaks are large (as in momentary, loud transients), the high-voltage rails are used.

This is more efficient than single-rail designs, and it provides extra headroom when necessary. In addition, it can lower the AC current draw and cooling requirements by up to 40 percent. If the same set of output transistors is used with both sets of rails, this is called a Class H design; if different transistors are used with the different rails, it is called a Class G design.

Another way to improve the efficiency of a power amp is to use a *switching power supply* (also known as a *high-frequency power supply*). Long used in computers

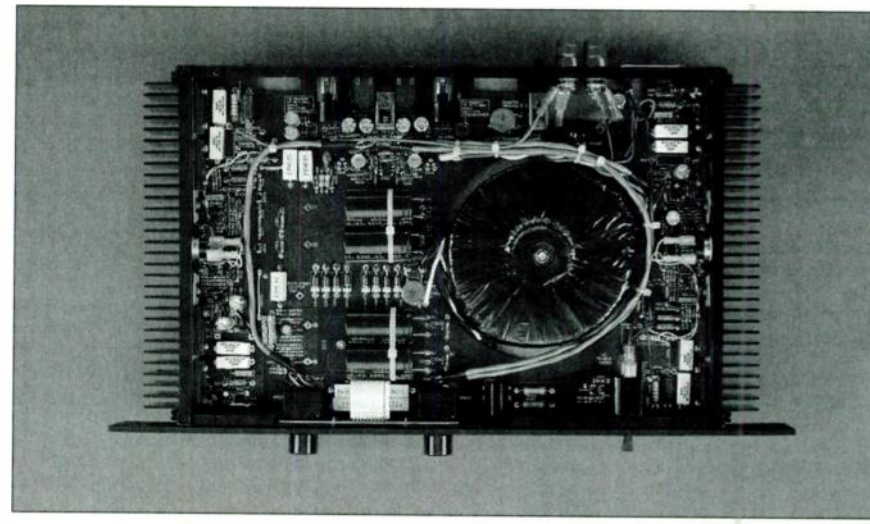

FIG. 1: The BGW 200 power amp includes a huge toroidal power transformer.

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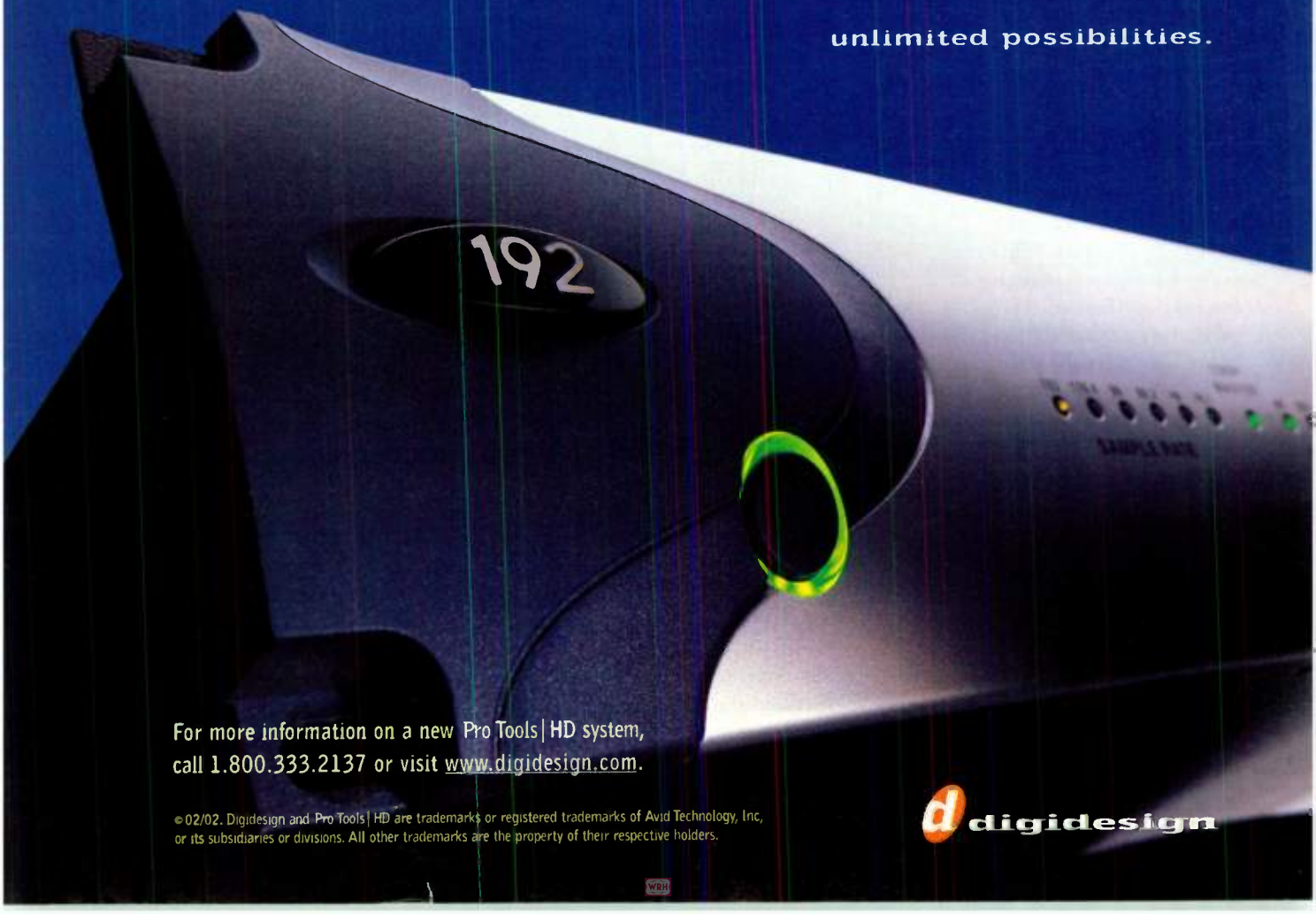

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and other devices, switching power supplies convert the incoming 60 Hz AC power to a substantially higher frequency, often over 100 kHz. This improves the performance of the transformer (the behavior of which is frequency dependent), allowing smaller, lighter transformers to be used.

Many people believe this type of power supply results in a more open sound with a clearer high end but that it also inherently compromises bass performance. Others contend that this bass problem is related to design implementation and undersized supplies. Correct design provides better voltage regulation, which results in improved low-frequency performance over 60 Hz power supplies. However, switching power supplies use more components and require more space. In general, they are more beneficial in high-power amps.

LET'S GET PHYSICAL

One of the most apparent physical characteristics of many power amps is the heat they generate. This occurs because power amps are very inefficient; typically, less than half the power from the wall is converted into a signal for the speaker. The rest of the incoming power turns into heat within the amp.

As a result, most amps use a variety of heat-management techniques. Perhaps the most obvious one is a *heat sink*, which consists of large metal fins that dissipate heat by radiating it from large surface areas (see **Fig. 3**). Some amps include fans, which might remain on continuously or kick in when the temperature rises above a certain threshold, but these can be distracting in a quiet studio environment. Thermal-overload protection circuitry shuts the amp down if the temperature rises too high.

Another physical characteristic of power amps is their weight, which is primarily due to transformers and heat sinks. The greater the amp's power output, the greater the heat and the heavier the transformers and heat sinks tend to be (at least, with conventional 60 Hz power supplies).

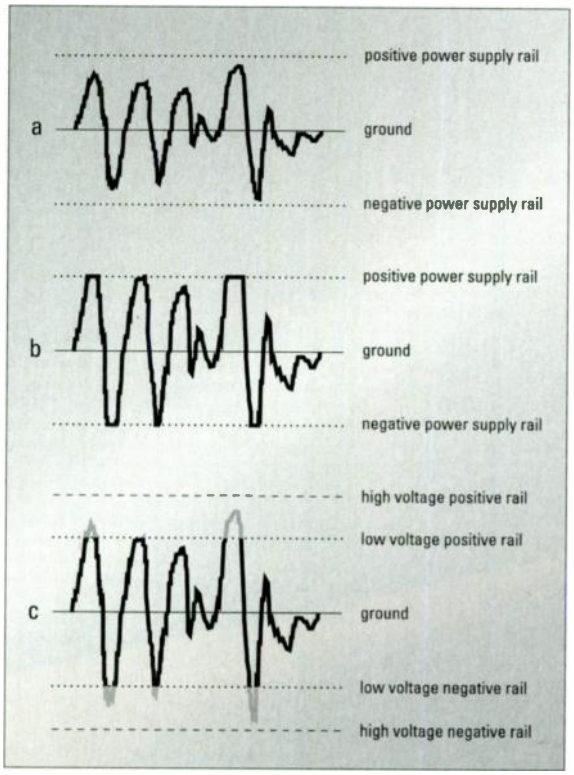

FIG. 2: As long as the voltage swings in the output voltage don't exceed the power-supply rails, the shape of the waveform is preserved (a). If the voltage exceeds the rails, the peaks are clipped (b). In a multirail design, the amp switches to higher-voltage rails as needed (c).

Most power amps have very few controls and indicators. The most common controls are a power switch and gain knobs, but many amps don't even include these. Some amps include an LED that indicates the presence of AC power, and they may have additional LEDs that indicate whether the outputs are clipping (discussed shortly). A few amps include level meters, but these are pretty useless; most dangerous transient peaks happen much more rapidly than the meter can indicate. However, meters can warn you if you are approaching clipping.

Of course, all power amps include input and output connectors. The inputs are typically balanced XLR or ¼-inch TRS jacks. The outputs are often 5-way binding posts, which let you connect speaker cables terminated with banana plugs or bare wires. In some cases, the outputs are simple barrier strips, which accept only bare wire.

OUTPUT POWER

Output power is the most commonly used (and abused) amplifier spec. The actual power output from an amp depends on the impedance of the speaker to which it is connected as well as the frequency range in which the power is measured and the total harmonic distortion (THD; defined shortly). As a result, power specs are normally stated with respect to a specific impedance, frequency range, and THD. For example, a power amp might be specified as producing 200 watts per channel (W/ch.) into 8Ω over a frequency range of 20 Hz to 20 kHz with a THD of 0.1 percent.

If the speaker impedance is lower, some amps can produce more power; for example, the same amp might theoretically produce 400 W/ch. into 4Ω. (In practice, cutting the speaker impedance in half does not quite double the output power because of the impedances within the amp itself.) Of course, this can't go on forever; as you decrease the speaker impedance, it tries to draw more and more current from the amp. At some point, the power supply can't supply any more current, and the signal starts clipping. Many amps include current-limiting protection circuitry to prevent this.

These power measurements are normally conducted in one of two ways, as specified by the Federal Trade Commission (FTC) and Electronic Industries Association (EIA). In the FTC measurement process, the stated power output must be achieved with both channels driven over the stated frequency range (usually 20 Hz to 20 kHz) at no more than the stated THD (generally 0.1 percent). An EIA power rating is

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stated for a single channel at a single midband frequency (typically 1 kHz) with 1 percent THD. This yields power ratings that are 10 to 20 percent higher than FTC measurements.

In general, an FTC rating tells you much more about the amp's actual performance. However, it is rare to see an FTC rating for a 2Ω load, which is near the point at which current-limiting protection circuitry kicks in. The EIA measurement can reliably deal with a 2Ω load, so it's best to see an FTC rating for 8Ω and 4Ω and an EIA rating for 2Ω.

There are two other power specs that must be considered: *continuous* and *peak power*. Continuous power is the maximum power level the amp can maintain over long periods of time, and peak power is the maximum amount of power the amp can deliver for a short time (typically less than half a second). The difference between an amp's continuous and peak power capabilities is called *dynamic headroom*. If an amp's continuous power rating is 100 watts and its dynamic headroom is 3 dB, it can provide short bursts of up to 200 watts.

One of the most common questions that most studio owners ask themselves is "How much power do I need?" The answer is generally "The more the merrier!" It's better to have too much power than not enough. You might think that too much power can damage the speakers, but this is rarely the case (at least, if you're fairly responsible). You can always turn down the input to a powerful amp, which leaves lots of headroom. In addition, this causes the amp to operate in its linear range, which results in less noise and a cleaner signal. An underpowered amp can be driven into clipping more easily, and it doesn't have much headroom because it's operating in its extreme range.

The next question is "How loud can the sound be from a given amp?" This depends on the amp's power output and the sensitivity of your speakers. At a given speaker sensitivity, the peak power output must increase by a factor of ten to increase the peak sound-pressure level by 10 dB. For example, suppose you have speakers with a sensitivity of 90 dB SPL at 1 watt at 1 meter (90 dB SPL @ 1W/1m). You only need one watt of power to achieve a peak of 90 dB SPL at that distance. To achieve a peak level of 100 dB SPL, you need 10 watts, and 100 watts will get you 110 dB SPL.

As mentioned earlier, however, most music peaks only occasionally; a typical ratio of peak-to-average levels is 6:1. To sustain an average sound- pressure level of 90 dB SPL with the ability to handle peaks cleanly requires about 500 watts. However, an average sustained level of 90 dB SPL is simply too loud, and an amp with reasonable dynamic headroom can handle short, high peaks, so most home studios can do quite well with less power.

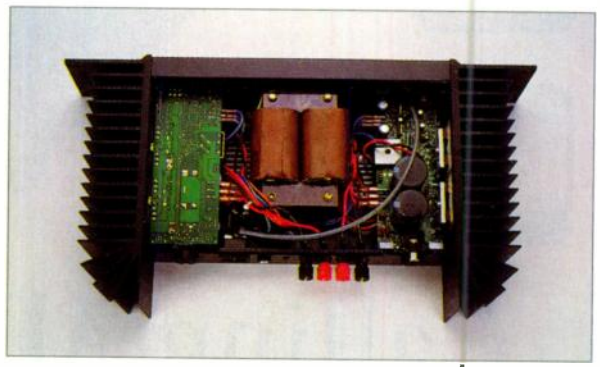

FIG. 3: The Hafler P3000 dissipates heat via large, cast-aluminum heat sinks.

SPEC WARS

In addition to continuous and peak power ratings, there are several other specs that help you evaluate the performance of power amps. As in other audio equipment, *frequency response* is the range of frequencies that the amp can pass with relatively little alteration from the input to the output (except for amplification, of course). The minimum requirement for an amp's frequency response is 20 Hz to 20 kHz, ±1 dB, which is usually specified at a nominal power level (typically 1W).

Some power amps publish frequency-response specs that far exceed this minimum (e.g., 0 Hz to 40 kHz). If the amp actually produces a 0 Hz (i.e., DC) signal (often called a *DC offset*), this can damage the speakers, so most amps include a protection circuit to prevent a DC offset from getting to the speaker. A high-frequency response above 20 kHz is generally not a problem; in fact, a very high response means that the high end of the human hearing range (20 kHz) will be reproduced with less distortion because it is in the amp's "linear" operating range, not at the extreme high end of the range. However, if the frequency response extends too high, the amp might not be protected from radio-frequency interference (RFI).

A related spec is *power bandwidth*, which is the range of frequencies the amp can reproduce at full power. If an amp can reproduce frequencies outside the range of human hearing at full power, it should have no trouble with frequencies within that range. As a result, the power bandwidth typically extends beyond the human-hearing range. However, a very broad power bandwidth can reduce the stability and reliability of an amp.

There are two types of distortion common to all power amps. *Total harmonic distortion* (THD) is the presence of extraneous frequencies that are multiples of the input frequencies. THD is normally expressed as a percentage of the total output. Some manufacturers measure THD at a single frequency; others measure it across the entire audible range. A THD of 0.1 percent or less is adequate, and values less than 0.01 percent are excellent.

Intermodulation distortion (IM) consists of the sum and difference frequencies of the two input signals to a stereo amp, and it is also expressed as a percentage of the total output. IM distortion is generally considered to be more objectionable than THD because its frequency components are not multiples of the input frequencies. The standard means

—continued on page 63

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Get in Sync

Some things to sync about when you need to connect your gear.

By Dan Phillips

Synchronization—getting two or more devices to record or play back together—is a fundamental factor in making a studio work. Sync issues are similar for analog and digital devices. In fact, synching digital devices is often simpler than synching their analog counterparts. There are some different methods in the digital synchronization toolkit, which may be unfamiliar to you. In this article, we'll look at the basic concepts of synchronization and how they apply in the digital domain.

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First, it's important to realize that synchronization has two components: one is starting at the same time, and the other is proceeding at the same speed. For the sake of convenience, we'll call the first "start sync" and the second "continuous sync." In the analog world, these are often two facets of a single synchronization method, such as SMPTE time code. With digital devices, on the other hand, they may be handled separately.

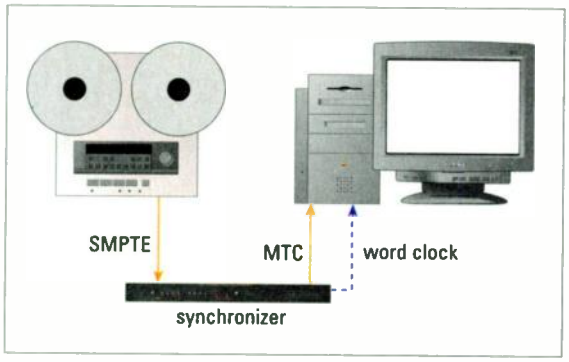

FIG. 1: When synching a computer-based digital audio system to an analog tape deck, a synchronizer translates SMPTE from the analog deck into word clock for the computer hardware.

ANALOG SYNC

Let's start with the analog case first. With analog tape, both start sync and continuous sync are generally handled by SMPTE (Society of Motion Picture and Television Engineers) time code. For instance, to synchronize two analog 24-track tape machines, you would stripe both tapes with SMPTE (that is, record time code onto a track) and connect the machines using an analog tape synchronizer.

The synchronizer listens to SMPTE from both machines and directly controls their motors, and also provides simple transport. When you press Play on the master machine, the synchronizer shuttles and varispeeds the tapes until both machines are playing back from the same point in the music: at the beginning of the second chorus, for example. Once this happens (and it can sometimes take a while), start sync is achieved.

If that were all that the synchronizer did, the tapes would start together but then gradually drift apart. This is because the machines' motors run at slightly different speeds, even though both are ostensibly moving the tape at 30 inches per second. To solve this problem, the synchronizer listens to the two SMPTE streams throughout playback, adjusting the tape speed as necessary so that the machines keep playing together.

ANALOG-TO-DIGITAL SYNC

Synching an analog system to a digital system, either tape or a DAW, is conceptually the same as synching two analog machines. The two systems need to start at the same point, and they must agree on the playback speed.

As with analog machines, time code, such as SMPTE or MIDI Time Code (MTC), is used for communicating the start point. Continuous sync, however, is achieved differently, because DAWs have no tape motors to control. Setting the playback speed must be accomplished with *word clock*.

A digital audio recording consists of a long stream of individual samples. You might picture each sample occupying a very small area on the surface of an analog tape. Just as analog tape moves across the tape heads at a constant speed (such as 30 inches per second), the samples within a digital audio recording flow by at a specific sample rate (such as 44.1 or 48 kHz).

The word clock controls this flow by setting the precise sample rate of the digital system. Each time the clock "ticks," the system sends or receives another sample. If the device's sample rate is 48 kHz, for instance, the clock will tick once each 48,000th of a second. The word clock thereby controls the "tape speed" of a digital system. Even on common digital tape systems, in fact, the word clock is what controls the speed of the physical tape transport; the tape speed is adjusted to match the word clock.

Word clock can be generated internally or received from an external source. Most digital audio connection formats, including S/PDIF, TDIF, AES/EBU, and ADAT Optical, include the word clock signal. Word clock can also be transmitted separately, without audio data.

To sync a digital system to an analog one, you need to translate the analog tape speed into the digital word clock. A number of synchronizers (such as the Mark of the Unicorn MIDI Timepiece AV, Opcode Studio 64 XTC, and Digidesign Universal Slave Driver) do exactly that: they read the SMPTE or MTC signal from the analog tape and use the rate of the time code to generate a word clock signal (see **Fig. 1**).

For instance, if SMPTE is running at 30 frames per second, and the audio sample rate is 48 kHz, each SMPTE frame corresponds to 1,600 ticks of the word clock. Synchronization ensures that when the SMPTE from the analog tape runs faster or slower, the word clock, and thus the "tape speed" of the digital audio system, speeds up or slows down accordingly.

Some digital audio software and hardware does this internally, without changing the audio hardware's word clock rate. Instead, they measure the incoming SMPTE or MTC stream, varispeed the audio in software, and then send out the processed audio at a constant sample rate.

DIGITAL TO DIGITAL

As with the all-analog and hybrid analog/digital cases above, all-digital setups also use time code for start sync. Depending on the equipment, they may use the familiar MTC or SMPTE time codes or new proprietary, sample-accurate time codes (as discussed later).

Continuous sync, happily, is much easier to achieve with all-digital setups. You no longer need to directly control physical tape speeds or varispeed word clock based on SMPTE or MTC. Instead, you connect the word clock ports of all the devices, so that the units play and record at exactly the same sample rate; thus, all will have the same "tape speed."

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You might think that, with the precision of digital equipment, 48 kHz would be the same from one machine to another, making word clock connections unnecessary. Unfortunately, this isn't the case. Just as analog tape decks differ on what 30 inches per second means, so digital devices interpret sample rates differently. With two machines set to 48 kHz, for example, one might really run at 47.998 kHz, while the other might run at 48.001 kHz.

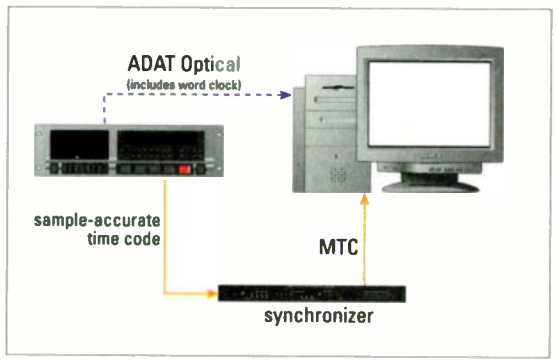

FIG. 2: Synchronizers can translate an MDM's sample-accurate time code into standard MTC. In this case, the time code and word clock from the ADAT follow separate paths.

The solution to this dilemma is a master-slave setup similar in concept to analog time-code configurations. The master sets the sample rate, and the slave(s) ignore their own internal clocks, using the master's clock instead. A proper word clock arrangement will ensure perfect, driftless, continuous sync between all connected devices.

You can think of each device's word clock as a mechanical gear, with every tooth in the gear representing a single sample. Spinning by themselves, the gears can move at any rate they like. But when two or more gears are fitted together, they move in lock-step precision. Every time one gear advances by a single tooth, the others turn exactly one tooth as well—no more, no less.

When the word clocks of digital audio devices are synchronized, they act in the same way. Each time the master plays a single sample, the slaves play one as well. If two devices are playing the same digital audio file, they will take exactly the same amount of time to play that file.

It's important to note that word clock synchronization is critical not only for achieving continuous sync but also for transmitting digital audio data accurately under any circumstances. Without proper word clock sync, you'll be plagued by audio artifacts, including pops, clicks, and distortion.

As a side note, standard word clock signals tick once per sample. In contrast, Digidesign's systems use a "superclock," which ticks 256 times per sample. The two clocks are not directly compatible, although some synchronizers offer both options. Some may even offer a single set of word clock I/O that is switchable between the two, so make sure that you've selected the correct option for your gear.

SETTING UP WORD CLOCK

Setting up a studio's word clock synchronization is usually done in two steps. First, the word clocks must be physically connected. You can do this by making a digital audio connection from the master to the slave, such as S/PDIF out to S/PDIF in, ADAT optical out to ADAT optical in, and so on.

Sometimes, you'll also need to use dedicated word clock cables, such as with complex setups or with devices that have word clock I/O but not digital audio I/O. With larger systems, you can also mix and match formats as required by the I/O available on each device.

The second step is configuring the slave devices to use the word clock from the master device. In digital audio software/hardware combinations, this is usually referred to as something like "sync source" or "audio clock source." On hardware devices, there may be an obvious front-panel selection (such as Clock Source on the ADAT XT), or a hidden key combination (as with original ADATs). Some older or simpler devices, such as DATs, may simply switch automatically as digital I/O is enabled or disabled, which can limit your options. Fortunately, most new devices are more flexible.

If your digital audio software supports software-based continuous sync, disable this feature; the word clock connection will take care of this via your hardware. In some cases, in fact, software-based continuous sync can interfere with hardware-based sync, causing audio artifacts or even total sync failure. Names for this parameter vary among software: in BIAS *Deck II*, for instance, you should enable Trigger Sync, while in Cakewalk *Pro Audio*, you should set the Audio Options>Advanced SMPTE/MTC Sync to Freewheel.

THE FINAL FRONTIER

With a proper word clock setup in an all-digital system, it's easy to achieve perfect, sample-accurate continuous synchronization. The accuracy of the start point, on the other hand, depends upon the type of time code being used.

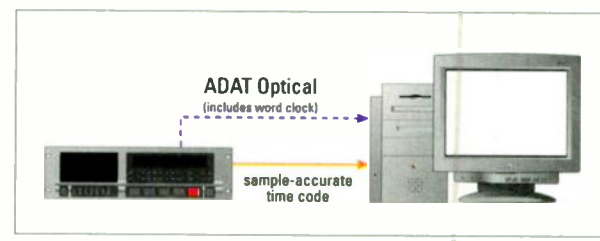

FIG. 3: With hardware and software that directly support sample-accurate time code, you can connect the MDM directly to your computer hardware.

MTC, for instance, offers resolution of a quarter frame at 30 frames per second, or a 120th of a second—equivalent to about 400 samples per second at 48 kHz. SMPTE may offer greater resolution in some cases; however, if you're using a digital audio program, chances are that SMPTE must be converted to MTC be-

—continued on page 118

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Alesis	Studio 32	16x4x2, 40x2	16/40	16/16	(6/4) 1/4"	(4) 1/4" TRS	High/low shelving	Yes	Yes	20 Hz–50 kHz
API	7600	4x1	Mic XLR; 1/4"	4/1	4/0	N/A	HP/LP filters	Yes	Yes	30 Hz–20 kHz
Ashly Audio	MX-508	8X2	8/8	8/8	(2/2) 1/4"	N/A	3-band w/sweepable mid	Yes	No	20 Hz–20 KHz +0/-0.5 dB
Behringer	Pro Mixer DX1000	12x2	2/10	0/0	1/2	2	3-band	Yes	Yes	10 Hz–100 kHz ± 3 dB
Behringer	Eurorack MX602A	6x2x2	2/2 (2 stereo)	0/0	2/2	N/A	3-band	No	No	10 Hz–60 kHz ± 3 dB
Behringer	Eurorack MX802A	8x2x2	4/4 (2 stereo)	0/0	2/2	N/A	3-band	No	No	10 Hz–120 kHz ±3 dB
Behringer	Eurorack MX1604A	16x4x2	4/4 (4 stereo)	0/0	2/2	N/A	3-band parametric mids	Yes	Yes	10 Hz–60 kHz ± 3 dB
Behringer	Eurorack MX2004A	20x4x2	8/8 (4 stereo)	8/0	2/2	N/A	3-band parametric mids	Yes	Yes	20 Hz–40 kHz ± 1 dB
Behringer	Eurodesk MX2442A	24x8x2	16/16	20	6/2	4	3-band parametric	Yes	Yes	20 Hz–40 kHz ± 1 dB
Behringer	Eurorack MX2642A	24x8x4	(8/8) 4 stereo	10/8	6/4	4	3-band parametric	Yes	Yes	20 Hz–40 kHz ± 1 dB
Behringer	MX3242X	16x4x2	16/16	16/16	(6/4) 1/4"	(4) 1/4"	4-band parametric	Yes	Yes	10 Hz-130 kHz
Behringer	Eurodesk MX3282A	24x8x2	24/24	24	8/4	8	3-band parametric	Yes	Yes	20 Hz–40k kHz ± 1 dB
Behringer	Eurodesk MX9000	24x8x2	24/24	24/24	6/6	3	4-band	Yes	Yes	20 Hz–40 kHz ± 1 dB
Carvin	C 844	8x4x2	8/10	8/8	(4/4) 1/4"	(4) 1/4"	3-band, sweep mid	Yes	Yes	20 Hz-20 kHz
Carvin	C 1644	16x4x2	16/10	16/16	(4/4) 1/4"	(4) 1/4"	3-band, sweep mid	Yes	Yes	20 Hz-20 kHz
Carvin	C 2444	24x4x2	24/10	24/24	(4/4) 1/4"	(4) 1/4"	3-band, sweep mid	Yes	Yes	20 Hz-20 kHz
Carvin	C 3244	32x4x2	32/10	32/32	(4/4) 1/4"	(4) 1/4"	3-band, sweep mid	Yes	Yes	20 Hz-20 kHz
Carvin	S/L24	24x8x2	24/32	24/32	(2/2) 1/4"	(2) 1/4", (2) RCA	Sweep mid/lo	Yes	Yes	20 Hz–20 kHz
Carvin	S/L40	40x8x2	40/48	40/48	(2/2) 1/4"	(2) 1/4", (2) RCA	Sweep mid/lo	Yes	Yes	20 Hz–20 kHz
Carvin	S/L56	56x8x2	50/58	50/58	(2/2) 1/4"	(2) 1/4", (2) RCA	Sweep mid/lo	Yes	Yes	20 Hz–20 kHz
Carvin	Studiomate	16x2	8/16	8	(2/2) 1/4"	(2) 1/4", (2) RCA	3-band	No	No	20 Hz–20 kHz
Crate	CSM8	8x2x1	8/8	8/8	4/2	(2) XLR, 1/4"	3-band	Yes	Yes	20 Hz–20 kHz
Crate	CSM12	12x2x1	12/12	12/12	4/2	(2) XLR, 1/4"	3-band	Yes	Yes	20 Hz–20 kHz
Crate	CSM16	16x2x1	16/16	16/16	4/2	(2) XLR, 1/4"	3-band	Yes	Yes	20 Hz–20 kHz
Crate	CSM24	24x2x1	24/24	24/24	4/2	(2) XLR, 1/4"	3-band	Yes	Yes	20 Hz–20 kHz
Crate	CSM1402	18x2x1	6/18	6/0	2/2	N/A	3-band	Yes	Yes	70 Hz–120 kHz
D&R	Vision 8	8x4x2	8	8/8	4/4	8/+ 4/-10 dBv	3-band	Yes	No	20 Hz–120 kHz -0.5 dB
FBT	Pickup 8E	8x2	4/4	2	2/2	2	3-band	No	No	20 Hz–90 kHz
FBT	Pickup 8X	8x2	4/4	2	2/2	2	3-band	No	No	20 Hz–90 kHz
FBT	Pickup 14E	14x2	6/8	4	2/2	2	3-band	No	Yes	20 Hz–90 kHz
FBT	Pickup 14X	14x2	6/8	4	2/2	2	3-band	No	Yes	20 Hz–90 kHz
FBT	Pickup 18E		10/8	6	3/3	2	3-band	Yes	Yes	20 Hz–90 kHz

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%@1 kHz	108 dB	>85 dB	Global	N/N	Yes	Rackmount; head/control room outs	19x6x5.25	$449
90 dB	<0.0025%@1 kHz	108 dB	>80 dB	Global	N/N	Yes	Inline monitor w/FX and control room sections	17.5x16.5x6	$1,149
-128 dB	<0.05%	N/A	N/A	48V	N/N	No	Units stack to build 4-buss console/sidecards	1U	$2,995
-90 dBu	<0.05%	-128 dBu	-85 dB	Yes	N/N	Yes	Rackmount	19.0x5.25x9.6	$1,519
115 dB	0.003%	N/A	N/A	No	N/N	No	Talkover mic function; remote start buttons	6x17.5x6	$449
-129.5 dBu	0.007%	N/A	N/A	48V	N/N	Yes		1.3x6.3x8.2	$85
-129.5 dBu	0.007%	125 dB	-95 dB	48V	N/N	Yes		3x9x10.6	$125
113.6 dB	0.007%	125 dB	-95 dB	48V	N/N	Yes	Alternate 3/4-bus; rackmount kit included	3.5x16x15	$209
-129.5 dBu	0.007%	125 dB	-95 dB	48V	N/N	Yes	Alternate 3/4 bus; rackmount kit included	3.5x16x15	$309
>129.5 dBu	0.007%	125 dB	- 95 dB	48V	Y/N	Yes		4x28.5x18	$869
-129 dBu	0.007%	125 dB	-95 dB	48V	N/N	Yes	Rackmount kit included	6x19x14	$499
-97 dB	0.006%	N/A	N/A	Global	Y/N	Yes	Digital effects/Mix-B	19x 3.75/9x21/22.5	$999
>129 dB	0.007%	125 dB	-95 dB	48V	Y/N	Yes		4x41x21	$1,479
>129 dBu	0.007%	125 dB	-95 dB	48V	Y/N	Yes	24 inputs with 2-band EQ, built-in meter bridge	8.6x37x29.5	$2,399
90 dB	<0.01%	104 dB	N/A	Switchable	N/N	Yes	XLR outs; 24-bit 256 voice DSP; dual 9-band graphic EQ; switching power supply 90 to 250 VAC operation	14.5x3.25x14.25	$400
90 dB	<0.01%	104 dB	N/A	Switchable	N/N	Yes	XLR outs; 24-bit 256 voice DSP; dual 9-band graphic EQ; switching power supply 90 to 250 VAC operation	22.5x3.25x14.25	$700
90 dB	<0.01%	104 dB	N/A	Switchable	N/N	Yes	XLR outs; 24-bit 256 voice DSP; dual 9-band graphic EQ; switching power supply 90 to 250 VAC operation	30x3.25x14.25	$900
90 dB	<0.01%	104 dB	N/A	Switchable	N/N	Yes	XLR outs; 24-bit 256 voice DSP; dual 9-band graphic EQ; switching power supply 90 to 250 VAC operation	38.1x3.25x14.25	$1,200
90 dB	<0.01%	104 dB	N/A	Yes	N/N	Yes	Low-noise toroid transformer	34.5x22.7x8	$2,400
90 dB	<0.01%	104 dB	N/A	Yes	N/N	Yes	Low-noise toroid transformer	52x22.1x8	$3,400
90 dB	<0.01%	104 dB	N/A	Yes	N/N	Yes	Low-noise toroid transformer	69.5x22.7x8	$5,000
90 dB	<0.01%	104 dB	N/A	Yes	N/N	Yes	Low-noise toroid transformer	16x12x3	$300
94 dB	< 0.1%	N/A	-70 dB	48V	N/N	No	Balanced XLR & 1/4" outs; PFL output	20.25x4.25	$480
94 dB	< 0.1%	N/A	-70 dB	48 V	N/N	No	Balanced XLR & 1/4" outs; PFL output	25.13x4.25	$600
94 dB	< 0.1%	N/A	-70 dB	48V	N/N	No	Balanced XLR & 1/4" outs; PFL output	29.75x4.25x16.5	$750
94 dB	< 0.1%	N/A	-70 dB	48V	N/N	No	Balanced XLR & 1/4" outs; PFL output	40.75x4.25x16.5	$950
N/A	N/A	N/A	N/A	Yes	N/N	Yes		N/A	$580
N/A	0.015%	Hdrm >22dB; max output 26dBu	>90 dB	Per channel	Y/Y	Yes	Fully modular; optional meter bridge	19" frame (can be rack-mounted)	$3,748
110 dB	0.003%	>129.5 dB	-85 dB	Yes	N/N	Yes	Built-in 256 multieffects DSP 32-bit processor. Rack mountable (rack mounts incl)	9.75x3.33x10.25	$599
110 dB	0.003%	>129.5 dB	-85 dB	Yes	N/N	Yes	Rack mountable (rack mounts incl)	9.75x3.33x10.25	$409
110 dB	0.003%	>129.5 dB	-85 dB	Yes	N/N	Yes	Built-in 256 multieffects DSP 32-bit processor Rack mountable (rack mounts incl)	12.33x3.33x13	$769
110 dB	0.003%	>129.5 dB	-85 dB	Yes	N/N	Yes	Rack mountable (rack mounts incl)	12.33x3.33x13	$579
110 dB	0.003%	>129.5 dB	85 dB	Yes	N/N	Yes	Built in dual 256 multieffects DSP w/32-bit processors Rack mountable (rack mounts incl)	17.25x3.33x15	$1,219

SEE PAGE 174 FOR A COMPLETE LISTING OF MANUFACTURERS' CONTACT INFORMATION

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
FBT	Pickup 18X		10/8	6	3/3	2	3-band	Yes	Yes	20 Hz–90 kHz
Mackie Designs	24.8/32.8	32x24x8x2	24/32	24/32	6 mon/6 ster	(24) 1/4"	4-band; low cut filter	Yes	Yes	20 Hz–60 kHz +0/-1 dB
Mackie Designs	406M Powered Mixer	8x2x2	6/6	6/6	(2/2) 1/4" TRS	N/A	3-band fixed; 9-band mono	Ch 1–6	No	10 Hz–30 kHz +0/-1 dB
Mackie Designs	408M Powered Mixer	10x2x2	8/12	6/6	(2/2) 1/4" TRS	N/A	3-band fixed; 9-band mono	Ch 1–6	No	10 Hz–30 kHz +0/-1 dB
Mackie Designs	408S Powered Mixer	10x2x2	8/12	6/6	(2/2) 1/4" TRS	N/A	3-band fixed; 9-band graphic	Ch 1–6	No	1 Hz–30 kHz +0/-1 dB
Mackie Designs	808M Powered Mixer	10x2x2	8/12	6/6	(2/2) 1/4" TRS	N/A	3-band fixed; 9-band graphic	Ch 1–6	No	10 Hz–30 kHz +0/-1 dB
Mackie Designs	808S Powered Mixer	10x2	8/12	6/6	(4/2) 1/4" TRS	N/A	3-band fixed; 9-band graphic	Ch 1–6	No	32 Hz–20 kHz +0/-1 dB
Mackie Designs	1202 VLZ Pro	12x2x2	4/12	4/4	(2/4) 1/4" TRS	(2) 1/4" TRS	3-band fixed	Yes	Yes	20 Hz–60 kHz +0/-1 dB
Mackie Designs	1402 VLZ Pro	14x2x2	6/14	6/6	(2/4) 1/4" TRS	(2) 1/4" TRS	3-band fixed	Yes	Yes	20 Hz–60 kHz +0/-1 dB
Mackie Designs	1604 VLZ Pro	16x4x2	16/16	16/8	(6/8) 1/4" TRS	(4) 1/4" TRS	3-band w/swept mid	Yes	Yes	5 Hz–100 kHz +0/-1 dB
Mackie Designs	1642 VLZ Pro	16x4x2	10/16	8/8	(4/8) 1/4" TRS	(4) 1/4" TRS	3-band w/swept mid	Yes	Yes	20 Hz–60 kHz +0/-1 dB
Mackie Designs	CFX 12	12x4x2	12/4	8/8	(4/2) 1/4" TRS	(4) 1/4" TRS	3-band; 9-band stereo graphic	Yes	Yes	32 Hz–20 kHz +0/-1 dB
Mackie Designs	CFX 16	16x4x2	16/4	12/12	(4/2) 1/4" TRS	(4) 1/4" TRS	3-band; 9-band stereo graphic	Yes	Yes	32 Hz–20 kHz +0/-1 dB
Mackie Designs	CFX 20	20x4x2	16/4	16/16	(4/2) 1/4" TRS	(4) 1/4" TRS	3-band; 9-band stereo graphic	Yes	Yes	32 Hz–20 kHz +0/-1 dB
MAM	LM 122	12x2	0/12	N/A	(1/2) 1/4"	N/A	No	No	No	10 Hz-20 kHz
MAM	MLM 62	6x2	2/4	N/A	(1/2) 1/4"	N/A	High; low	No	No	4 Hz-20 kHz
MAM	MM 42	4x2	4/0	N/A	(1/2) 1/4"	N/A	High; low	No	No	5 Hz-20 kHz
MAM	SLE 82	8x2	N/A	N/A	(1/2) 1/4"	N/A	No	No	No	4 Hz-20 kHz
Oram Pro	Octamix	8x2x1	8	N/A	N/A	(2) XLR	N/A	No	No	18 Hz–73 kHz
Peavey	16-LM	8x2	8 stereo	N/A	N/A	N/A	No	No	No	20 Hz–20 kHz +0/-1 dB
Peavey	RQ-200	6x2	6/6 (4 stereo)	2	2	N/A	2-band; shelving	No	No	20 Hz–20 kHz +0/-0.5 dB
Peavey	RQ-2310	10x2x2	8/8 (2 stereo)	4/2	4/2	N/A	3-band; mid-sweep	Yes	Yes	20 Hz–20 kHz +0/-0.5 dB
Peavey	RQ 3014	10x2x2	6/4	6	3/2	2	2-band; mid sweep	Yes	Yes	20 Hz–20 kHz +0/-3 dB
Peavey	RQ-4324	24x4x3	24/24	24/0	6/2	7/Group 1-4	3-band; mid-sweep	Yes	Yes	20 Hz–20 kHz +0/-0.5 dB
Peavey	RQ-4332	32x4x3	32/32 (2 stereo)	32/0	6/2	7/Group 1-4	3-band; mid-sweep	Yes	Yes	20 Hz–20 kHz +0/-0.5 dB
Peavey	RSM-4062	16x4x2	16/16 (8 stereo)	8/8	8/6	6/Group 1-4	3-band; mid-sweep	Yes	Yes	20 Hz–20 kHz +0/-0.5 dB
Peavey	Unity 1002-8 RQ	8x2	8	N/A	2/0	2	3-band	No	No	20 Hz–20 kHz
Peavey	Unity 2002-12 RQ	12x2	12	N/A	4/0	2	3-band	No	No	20 Hz–20 kHz
Redwood	STK-VX802	6x2	4x4	N/A	(2) 1/4"; 1/4" stereo	(2) 1/4"	3-band fixed	No	Yes	20 Hz-60 kHz +0/-1 dB
Redwood	STK-VX802FX	6x2	4/4	N/A	(2) 1/4"; 1/4" stereo	(2) 1/4"	3-band	No	Yes	20 Hz-60 kHz +0/-1 dB
Redwood	STK-VX1202N	8x2	8/8	2/0	(3/2) 1/4" stereo	(2) XLR, 1/4"	4-band	Yes	Yes	20 Hz-60 kHz +0/-1 dB
Redwood	STK-VX1443R	12x4x2	10/4	10/8	(4/2) 1/4" stereo	(4) 1/4"	4-band fixed	Yes	Yes	20 Hz-60 kHz +0/-1 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
110 dB	0.003%	>129.5 dB	85 dB	Yes	N/N	Yes	Rack mountable (rack mounts incl)	17.25x3.33x15	$929
90 dBu	0.0013%	114 dBu	-91 dBu	Yes	Y/N	Yes	Inline monitoring	Depends on configuration	$3,599–$4,499
>105 dB	<0.10%	120 dB	75 dB	15V	N/N	Yes	Built-in effects; switchable stereo/mon. mains	11.7x20.5x13	$699
>105 dB	<0.10%	120 dB	75 dB	15V	N/N	Yes	Built-in effects; switchable stereo/mon. mains	11.7x20.5x13	$829
>105 dB	<0.10%	120 dB	75 dB	15V	N/N	Yes	Built-in effects; switchable stereo/mon. mains	11.7x 20.5x3	$929
>105 dB	<0.10%	120 dB	75 dB	15V	N/N	Yes	Built-in effects; switchable stereo/mon. mains	11.7x 20.5x13	$979
>105 dB	<0.10% @ 8Ω	120 dB	>75 dB	15V	N/N	Yes	Built-in effects; switchable stereo/mon. mains	11.7x20.5x13	$1,079
>107 dB	0.0007%	130 dB	-84 dBu	48V	N/N	Yes	XDR mic preamps; alternate 3/4 bus	2.6x11.8x11.2	$489
>107 dB	0.0007%	130 dB	-84 dBu	48V	N/N	Yes	XDR mic preamps; alternate 3/4 bus	2.9x14x12.9	$659
>107 dB	0.0007%	130 dB	-84 dBu	48V	N/N	Yes	XDR mic preamps; rotatable patchbay	5x19x17.6	$1,299
>107 dB	0.0007%	130 dB	-84 dBu	48V	N/N	Yes	XDR mic preamps	5.45x16.63x17.28	$1,049
>105 dB	<0.05%	120 dB	-90 dB	48V	N/N	Yes	Built-in effects; 75Hz/XLR subwoofer output	4.6x17.2x15.7	$719
>105 dB	<0.05%	120 dB	-90 dB	48V	N/N	Yes	Built-in effects; 75Hz/XLR subwoofer output	4.6x21.4x15.7	$929
>105 dB	<0.05%	120 dB	-90 dB	48V	N/N	Yes	Built-in effects; 75Hz/XLR subwoofer output	4.6x25.6x15.7	$1,129
>90 dB	0.002%	>88 dB	N/A	No	N/N	No	1U	19x1.75x3.5	$259
>97 dB	0.003%	>96 dB	N/A	No	N/N	No	1U	19x1.75x3.5	$199
>92 dB	0.002%	>90 dB	N/A	Global	N/N	No	1U	19x1.75x4.2	$239
>97 dB	0.002%	>93 dB	N/A	No	N/N	No	1U	19x1.75x3.5	$169
N/A	>0.005%	N/A	N/A	No	N/N	No	Pan; 2 stereo XLR mix outs; headphone cue	1 RU	$1,895
92 dB	<0.01%	110 dB	N/A	No	N/N	No	1U	19x7x1.7	$150
128 dBu EIN	<0.01%	102 dB	N/A	Yes	N/N	No	AC/battery power	14x10x3	$220
128 dBu EIN	<0.005%	110 dB	> 80 dB	Yes	N/N	Yes	2 "super channels"	16.2x19x4.5	$490
N/A	<0.01%	110 dB	90 dB	Yes	N/N	Yes	2 "super channels"	15x16x4.3	$630
128 dBu EIN	<0.005%	110 dB	> 85 dB	Yes	N/N	No	2 "super channels"	36.5x19x9	$1,600
128 dBu EIN	<0.005%	110 dB	> 85 dB	Yes	N/N	No	2 "super channels"	44.5x19x9	$2,000
128 dBu EIN	<0.005%	110 dB	> 85 dB	Yes	N/N	Yes	2 "super channels"	19x14x8	$1,250
N/A	<0.01%	110 dB	90 dB	Yes	N/N	Yes		17x16x3.2	$440
N/A	<0.01%	110 dB	90 dB	Yes	N/N	Yes		23x16x3.2	$550
>90 dB	<0.005%	N/A	-85 dBu	Global	N/N	No	Stereo channel switchable to RIAA level/EQ; optional crossfader available for stereo channel	10x10x3	$275
90 dB	<0.005%	N/A	-85 dBu	Global	N/N	No	Stereo channels switchable to RIAA level EQ; optional crossfader available for stereo channels; on-board digital effects processor	10x10x3	$380
>90 dB	<0.005%	N/A	-86 dBu	Global	N/N	Yes	Channels sent to separate "B" mix outputs when Mute is pushed	12x14x3	$450
>90 dB	<0.005%	N/A	-85 dBu	Global	N/N	Yes	On board 7-band master graphic EQ; built-in subwoofer output; rackmountable	19x15x4	$800

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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
Redwood	STK-VX1602N	12x2	8/8	4/0	(3/2) 1/4" stereo	(2) XLR; 1/4"	4-band fixed	Yes	Yes	20 Hz-60 kHz +0/-1 dB
Redwood	STK-VX2043FX	18x4x2	16/4	16/0	(4/4) 1/4" stereo	(4) 1/4"	4-band	Yes	Yes	20 Hz-60 kHz +0/-1 dB
Redwood	STK-VX2442N	20x4x2	20/8	16/8	(4/4) 1/4" stereo	(4) 1/4"	3-band mid sweep	Yes	Yes	20 Hz-60 kHz +0/-1 dB
Redwood	STK-VX3242N	28x4x2	24/8	24/16	(6/4) 1/4" stereo	(4) 1/4"	3-band mid sweep	Yes	Yes	20 Hz-60 kHz +0/-1 dB
Rolls	MX54 ProMixPlus	3x2	3	N/A	N/A	(1) 1/4"	No	No	No	25 Hz–16 kHz
Rolls	MX56s Playmate	4x2	1/3	N/A	N/A	(1) 1/4"	No	No	No	20 Hz–20 kHz
Samson	MPL 1204 Rackmount Mixer	12x4x2	12/12	12/12	24	N/A	3-band	Yes	Yes	<10 Hz–60 kHz
Sony	SRP-V110	34x8x2	10/24	10/8	(8/8) 1/4"	(8) RCA	3-band, mid-sweep	Yes	Yes	20 Hz–20 kHz ± 0.5 dB
Soundcraft	Folio FX8	16x2x2	8/16	8/8	(3) 1/4"	(4) 1/4"	3-band, mid-sweep	Yes	Yes	20 Hz–20 kHz
Soundcraft	Ghost LE:24	24x8x2	24/24	24/24	(8/8) 1/4"	8 1/4"	4-band w/2 fully parametric mid bands	Yes	Yes	20 Hz-20 kHz
Soundcraft	LX 7/16	16x4x2x1	16/16	16/8	(6) 1/4"	(7) 1/4"	4-band; 2 mid-sweep	Yes	Yes	20 Hz–20 kHz
Soundcraft	LX 7/24	24x4x2x1	24/24	24/16	(6) 1/4"	(7) 1/4"	4-band; 2 mid-sweep	Yes	Yes	20 Hz–20 kHz
Soundcraft	LX 7/32	32x4x2x1	32/32	32/24	(6) 1/4"	(7) 1/4"	4-band; 2 mid-sweep	Yes	Yes	20 Hz–20 kHz
Soundcraft	Spirit FX16	16x2x2	16/16	16/16	(3) 1/4"	(4) 1/4"	3-band; mid-sweep	Yes	Yes	20 Hz–30 kHz
Soundcraft	Spirit M4	12x2	4/16	8/8	(4/8) RCA	2	4-band, 3 mid-sweep	Yes	No	20 Hz–20 kHz ± 1dB
Soundcraft	Spirit M8	16x2	8/16	8/8	(4/8) RCA	2	4-band; 3 mid-sweep	Yes	No	20 Hz–20 kHz ± 1dB
Soundcraft	Spirit M12	20x2	12/16	8/8	(4/8) RCA	2	4-band; 3 mid-sweep	Yes	No	20 Hz–20 kHz ± 1dB
Soundcraft	Spirit Notepad	8x2	4/8	N/A	(1) 1/4"	N/A	2-band; fixed	No	No	20 Hz–20 kHz
Soundcraft	Spirit Powerpad	8x2	4/8	N/A	(1) 1/4"	N/A	2-band; fixed	No	No	20 Hz–20 kHz
Soundcraft	Spirit SX	12x2x2	16/20	12/8	(3) 1/4"	(4) 1/4"	3-band; mid-sweep	Yes	Yes	20 Hz–30 kHz
Studiomaster	162BP	16x2	16/14	16/14	2/1	(2) XLR	3-band; mid sweep	No	Yes	20 Hz–20 kHz
Studiomaster	Mixdown Classic 24	24x16x8x2	24/24	34/24	(6/18) 1/4"	(8) 1/4"	3-band	Yes	Yes	30 Hz–20 kHz
Studiomaster	Mixdown Classic 32	32x16x8x2	32/32	42/32	(6/18) 1/4"	(8) 1/4"	3-band	Yes	Yes	30 Hz–20 kHz
Studiomaster	Pro 2 163	12x2x1	12/14	12/0	(5/2) 1/4"	(3) XLR	3-band w/mid sweep	Yes	Yes	20 Hz–20 kHz
Studiomaster	Pro 2 203	16x2x1	16/18	10/0	(5/2) 1/4"	(3) XLR	3-band w/mid sweep	Yes	Yes	20 Hz–20 kHz
Studiomaster	Trilogy T 140	10 ch expander	10/12	8/8	6/4	(4) 1/4"	3-band w/mid sweep	Yes	Yes	20 Hz–20 Khz
Studiomaster	Trilogy T 166	12x4x2x1	12/14	14/10	(6/18) 1/4"	(4) 1/4"	3-band w/mid sweep	Yes	Yes	20 Hz–20 kHz
Studiomaster	Trilogy T 206	16x4x2x1	16/18	18/14	(6/18) 1/4"	(4) 1/4"	3-band w/mid sweep	Yes	Yes	20 Hz–20 kHz
Studiomaster	Trilogy T 326	24x4x2x1	24/28	24/20	6/8	(4) 1/4"	3-band w/sweep mids	Yes	Yes	20 Hz–20 kHz
Studiomaster	Trilogy T-406	32x4x2x1	32/28/4	32/28	6/4	(4) 1/4"	3-band w/mid sweeps	Yes	Yes	20 Hz–20 kHz
Yamaha	GF 12/12	12x4x2	8/12	8/8	(6/4) 1/4"	(4) 1/4"	3-band; mid-sweep	Yes	Yes	20 Hz–20 kHz
Yamaha	GF 16/12	16x4x2	12/16	12/12	(6/4) 1/4"	(4) 1/4"	3-band; mid-sweep	Yes	Yes	20 Hz–20 kHz
Yamaha	GF 24/12	24x4x2	20/24	20/20	(6/4) 1/4"	(4) 1/4"	3-band; mid-sweep	Yes	Yes	20 Hz–20 kHz
Yamaha	MX 12/6	12x4x2	8/12	4/4	(3/2) 1/4"	(4) 1/4"	3-band	Yes	No	20 Hz–20 kHz
Yamaha	MX 20/6	20x4x2	16/20	8/8	(3/2) 1/4"	(4) 1/4"	3-band	Yes	No	20 Hz–20 kHz

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%	N/A	-86 dBu	Global	N/N	Yes	Channels sent to separate "B" mix outputs when Mute is pushed	16x14x3	$580
>90 dB	<0.005%	N/A	-86 dBu	Global	N/N	Yes	On board digital effects; 7-band master graphic EQ; built-in subwoofer send	29x15x4	$1,000
>90 dB	<0.005%	N/A	-86 dBu	Global	Y/N	Yes	Switchable in 2 groups of 8 ch	31x15x4	$1,420
>90 dB	<0.005%	N/A	-86 dBu	Global	Y/N	Yes	Switchable in 2 groups of 8 ch	38x20x4	$2,200
84 dB	0.02%	84 dB	-70 dB	+18 VDC	N/N	No		5.3x3.7x2	$150
>80 dB	<0.05%	84 dB	-70 dB	12 VDC	N/N	No		19x2.5x1.75	$100
-90 dB	0.056%		80 dB	48V	N/N		10-segment LED meters; headphone out; 56 mm faders	7x19x7.1	$600
-95 dB	<0.005%	>95 dB	90 dB	Yes	N/N	No	Rackmounts optional	17x4.75x 5.625	$2,180
N/A	<0.009%	N/A	>96 dB	Global	N/N	Yes	Built-in Lexicon effects	17.5x16.5x4.1	$650
N/A	0.002%	N/A	-100 dB (mic input to line input)	Yes	Y/Y	Yes	Ultra-quiet preamps; in-line multitrack mixes with Mix B path; non-LE version features transport and automation facilities; 32-ch version and 24-ch expander module also available	41.71x30.75x8.97	$5,495
N/A	<0.006%	N/A	>95 dB	Global	Y/N	Yes	Left, right, and mono outputs	19.5x26x7	$1,700
N/A	<0.006%	N/A	>95 dB	Global	Y/N	Yes	Left, right, and mono outputs	19.5x34x7	$2,100
N/A	<0.006%	N/A	>95 dB	Global	Y/N	Yes	Left, right, and mono outputs	19.5x42x7	$2,800
N/A	<0.009%	N/A	>96 dB	Global	N/N	Yes	Built-in Lexicon effects; rotatable patch bay	17.5x18x6.3	$1,100
N/A	<0.008% @ 1kHz	N/A	<90 dB	Global	N/N	Yes	S/PDIF digital output; integral rack rails	20.9x16x5	$700
N/A	<0.008% @ 1kHz	N/A	<90 dB	Global	N/N	Yes	S/PDIF digital output; integral rack rails	20.9x20.2x5	$850
N/A	<0.008% @ 1kHz	N/A	<90 dB	Global	N/N	Yes	S/PDIF digital output; integral rack rails	20.9x20.2x5	$1,000
N/A	<0.005%	N/A	>90 dB	Global	N/N	Yes	Optional mic stand adapter	8.7x9.6x2	$200
N/A	<0.005%	N/A	>90 dB	Global	N/N	Yes	Built-in 30W x 2 power amp	9.8x9.3x4	$430
N/A	<0.006%	N/A	>95 dB	Global	N/N	Yes	100 mm faders	19x20x2.8	$700
85 dB	0.006%	108 dB	85 dB	48V global	N/N	Yes	Rack mount; internally modular; rear patching	19x4.8x10.5	$649
92 dB	0.005%	N/A	-95 dB	48V per ch	Y/Y	Yes	MIDI muting; split design; meter bridge	47.2x25.5x5	$2,995
92 dB	0.005%	N/A	-95 dB	48V per ch	Y/Y	Yes	MIDI muting; split design; optional meter bridge	58.5x25.5x5	$3,595
89 dB	0.0085%	112 dB	90 dB	48V	N/N	No	100 Hz channel HPF; rackmountable	21.19x2.13x 3	$870
89 dB	0.0085%	112 dB	90 dB	48V	N/N	No	100 Hz channel HPF	24.19x21.13x3	$1,070
89 dB	0.0085%	112 dB	90 dB	48V	N/N	Yes	Rackmountable	15.75x21.13xH: 3	$449
89 dB	0.0085%	112 dB	90 dB	48V	N/N	Yes	Expandable to 22 channels; rackmountable	21.19x2.13x3	$995
89 dB	0.0085%	112 dB	90 dB	48V	N/N	Yes	Expandable to 26 channels	24.19x21.13x3	$1,195
89 dB	0.0085%	112 dB	90 dB	48V	N/N	Yes	Combo XLR/stereo, monitor/stereo channels	34x21.125x3	$1,595
89 dB	0.0085%	112 dB	90 dB	48V global	N/N	Yes	Expandable to 42 and 52 channels	42.6x21.125x3	$1,895
-128 dB	>0.1%	-95 dB	70 dB	48V global	N/N	Yes	Aux masters on faders	23x19x6.25	$1,049
-128 dB	>0.1%	-95 dB	70 dB	48V global	N/N	Yes	Aux masters on faders	27.5x19x6.25	$1,249
-128 dB	>0.1%	-95 dB	70 dB	48V global	N/N	Yes	All aux busses have master faders	37x19x6.25	$1,679
93 dB	0.1%	128 dB	-70 dB	48V global	N/N	Yes	Built-in effects	17.25x15.13x3.38	$649
93 dB	0.1%	128 dB	-70 dB	48V global	N/N	Yes	Built-in effects	25.88x15.13x3.38	$949

SEE PAGE 174 FOR A COMPLETE LISTING OF MANUFACTURERS' CONTACT INFORMATION

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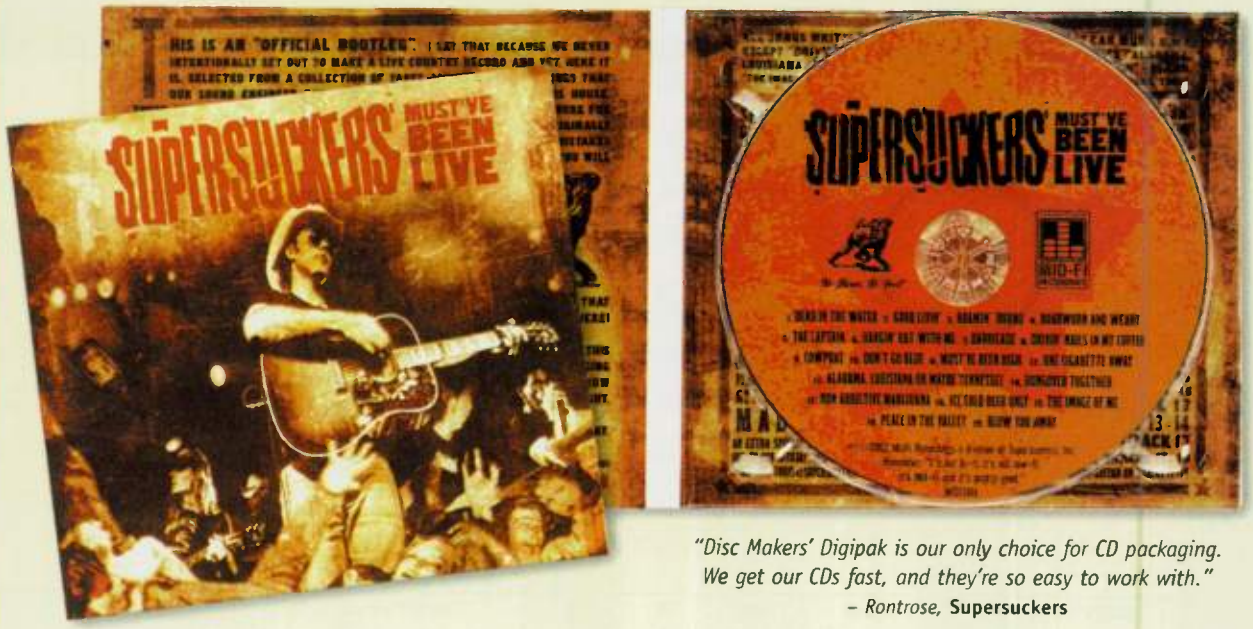

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- Shielded for video monitors
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PRO AUDIO REVIEW 2001 Pick reviewer's

Pro Audio Review chose the SRS6.5 as one of the top 20 products of 2001

SRS monitors are super accurate and extremely flat ±3dB over a frequency range of 50-20k Hz. Studio professionals know how important a flat frequency response is. For the home studio newcomer, this simply means you will hear an exact representation of your recording. There won't be any unwanted coloration to mislead you. You'll hear crisp highs from the fluid-filled, silk dome tweeter and tight, clean bass from the heavy-duty 6.5" woofer. Front porting allows you to place the speaker on a shelf without worrying about low frequencies hitting the rear wall and creating a false bass response. Shielding protects video monitors from the powerful speaker magnets.

SRS6.5 Rear

The active 100w RMS SRS6.5A biamped circuits (70w low & 30w high) offer efficient power transfer. Professional balanced XLR inputs with a -12dB pad make connections easy. The 90-250V auto-switching power supply means no unwanted hum and compatibility with worldwide power.

SRS6.5A Rear

The most useful feature of the SRS monitor is the unique "contour" switch. Let's face it, everyone else will not be listening through studio monitors. The contour switch allows you to engage a different crossover circuit giving you a typical frequency response of a home stereo speaker. Experience what others will hear by simply flipping a switch!

Bottom line: These awesome sounding monitors (powered or passive) are simply one of the best near-field monitors available.

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SRS6.5-2 $279.99 pair

SRS6.5A ACTIVE POWERED
Active Biamp: Low 70w RMS, High 30w RMS
Amp Response: 20 to 20 k Hz, THD .03%
Enclosure Response: 50 to 20 k Hz, ± 3 dB
Inputs SRS6.5A: Bal. XLR, 12dB attenuation pad, 90-250VAC, 50-60 Hz, LED power indicator
Woofer Enclosure Type: Front Ported Box
Protective Coating: Black Duratex™
SRS6.5A: 9.25"W x 11.75"D x 14.75"H, 23 lbs.

SRS6.5 PASSIVE
Inputs SRS6.5: Gold 5-way binding posts
Enclosure Response: 50 Hz to 20 kHz, ± 3 dB
Sensitivity: 92.5 dB SPL, 1 Watt @ 1 meter
Power Handling: 125w continuous
Recommended Amp: 50 to 150 watts
Nominal Impedance: 8Ω
SRS6.5: 9.25"W x 9"D x 14.75"H, 21 lbs.

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By Bill Gibson

EDITING THE MIXED MASTER

If you've completed mixing all ten or so songs for your album, it's time to get everything into a form that the duplication facility can work with.

If you'll be compiling all of your songs, you'll need to do some sort of editing.

Editing can be performed by actually cutting the analog master with a razor blade and taping the pieces back together again or through the use of a computer- based digital editor. You might want to edit for these reasons:

• To put your songs in the correct order.

• To remove a section or sections of a song. If you've recorded the "album" version of a song and end up needing a shorter, more commercial version, you could end up cutting a five- minute song down to a three and a half– minute song; this is quite common.

• To reuse a section at another time in the song. Sometimes one chorus section will be good and one will be bad. You could end up copying the good chorus section and using it in place of the bad one. This is also common with single phrases, lines or lyrics.

• To lengthen a song. When you've been disciplined in your recording procedures and have produced a perfect three and a half-minute song, someone is bound to request the "dance" mix —that should be six minutes long, or longer. In this case, you'll need to grab bits of your song, remix them in several different ways, then reassemble the pieces into something much longer than the original piece of music.

Special effects are also possible with editing. You can achieve sounds that can't be gotten during mixdown, like backwards sections.

If you're using a digital editor, time and pitch changes can be made fairly effortlessly.

Editing is very important in the professional audio world and requires much practice whether you're actually cutting and splicing tape with a razor blade or using the newest digital editor.

If you've printed several mixes of your songs, you'll need to select the mix of each song that's perfect for your album,; and then you'll have to decide on an order for the songs. Song order is an important part of the flow and impact of any album. With the right one song order a listener can be pulled through an entire album with ease. If the order is wrong, the listener might be lulled to sleep or end up so emotionally jostled that they're left with a bad feeling from the whole album.

The actual order is often determined by the style and personality of the artist. Many albums include the third song on side one as the title song. Sometimes the title song is the first song. Sometimes the title of the album doesn't come from a song, but from the intellectual theme of the album. These are artistic choices that reflect the personality of the artist.

Always include the tones that you originally recorded on your 2-track masters—1 kHz, 10 kHz, and 100 Hz, all at 0 VU. These are very important for the duplication facility to recognize the settings of your equipment.

Adjust spacing between songs according to the energy and pace demanded by the energy of the music. A standard space between songs is four seconds. When you're dealing with fade outs, begin the four-second space from where the mix totally loses its presence, which might be sooner than the point that the last drop of music has passed. Generally, the more contrast between songs, the longer the gap between the songs.

If your project is going to be printed to CD, you have one order of songs to consider and one musical and emotional flow. If your project is going to cassette, you'll need to plan two separate sides that have their own flow, emotion and life. A very important point for the logistics of cassette duplication is the comparative lengths of side A and side B. Side A should be slightly longer than side B. If side A is longer, the cassette can be listened to completely with minimal gap between side A and side B. If there is dead space it should be at the end of side B. ■

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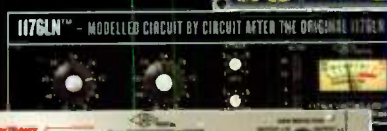

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MANUFACTURER	PRODUCT	CONNECTOR TYPE	# OF PATCH-BAY POINTS	PREWIRED	MODULAR	PROGRAMMABLE	NORMALING	SPECIAL FEATURES	PRICE
AP Audio	APB-48S	1/4" TRS	48	Yes	Yes	No	Yes	Optional cable tester and other modules	$130
AP Audio	APB-48SH	Balanced (hard-wired)	48	No	Yes	No	Yes	Optional cable tester and other modules	$130
Behringer	Ultra Patch Pro PX2000	1/4"	48	No	Yes	No	Full; half	4 modes via topside switches	$49
CM Automation	PM 64 Router/Level Controller	DB 25	32 x 32	No	Yes	Yes	N/A	Remote control via RS-232 port; optional DB8 connector	$2,499
CM Automation	PM 216 Automated Patch Bay/Mixer	DB 25	16 x 16	No	Yes	Yes	N/A	Multiple units networkable via MIDI; 2-bus mixer	$699
Connectronics	JB24	1/4" TRS or TS	48	Yes	Yes	No	Full, half, through		$775
Connectronics	XB16KV/XB32KV	Any combination	16 x 32	Yes	Yes	No	N/A	Wide range of connector types	$94-$174
dbx	PB48	1/4" TRS	48	No	Yes	No	Full, half		$150
Fostex	3013	1/4"	16	Yes	No	No	Half		$105
Fostex	DS-8 Digital Patch Bay	S/PDIF (6 optical + 2 coaxial)	8	No	No	No	N/A	Selectable 24-, 20-, 16- and 12-bit modes	$340
Friend-Chip Electronics	DMX 12/8	RCA; Toslink	20	Yes	No	Yes	N/A	50 memory; remote control via MIDI	$649
Friend-Chip Electronics	DMX 16	XLR; RCA; Toslink; TDIF	32	No	Yes	Yes	N/A	50 memory; format conversion; resampling	$549 plus modules
Friend-Chip Electronics	DMX 32	XLR; RCA; Toslink; TDIF	64	No	Yes	Yes	N/A	50 memory; format conversion; resampling	$799 plus modules
Frontier Design	Apache Digital Patchbay	Optical (ADAT or S/PDIF)	24	Yes	Yes	Yes	N/A	Scanning/activity status modes; MIDI I/O for remote from computer; cascadable for unlimited expansion; routing controls and indicators on front panel; 1U rackmount	
Carvin	PB 48	1/4" TRS	48	No	Yes	No	Full, half	Solderless	$70
Furman	PB-48 Balanced Patch Bay	1/4" TRS	48	No	Yes	No	Half	Denormalizable; 1/4" TRS on rear	$169
Furman	PB-48D Balanced Patch Bay	1/4" TRS	48	No	No	No	Half	6 D-sub connectors on rear; denormalizable	$229
M Audio	Digipatch 12x6 Digital Patch Bay	S/PDIF (coaxial/optical) ADAT optical	12 x 6	Yes	No	Yes	N/A	50 factory presets, 49 user	$500
Neutrik	Easy Patch NPP Series	TB	48	Yes	No	Yes	Full; half; no; parallel; double	Solderless construction	$725
Neutrik	Easy Patch NPPA Series	TT	96	Yes	No	Yes	Full, half; no; parallel, double	Solderless construction; digital-capable	$775
Neutrik	Patchlink SP-L	1/4" TRS	48	No	Yes	Yes	Full; half; isolated; parallel	Gray normaled jack for faster identification	$125
Neutrik	Rean MA 96	TT	96	No	No	Yes	All options	Black, silver, red, or blue	$350-$425
Neutrik	Rean LF48 Series	TB	48	No	Yes	Yes	All options	Black, silver, red, or blue front panels avail.	$250-$300
Neutrik	XPM Series	TT or Bantam	96	No	No	Yes	All options	Black, silver, red, or blue	$350-$425
Pro-Co	PJ Series	1/4" TRS; PJ, WECO; Long frame	52	Yes	No	No	All options	Customized options available	$250-$1,600
Pro-Co	TT Series	Bantam (TT); 1/4" TRS	96	Optional	No	No	All options	Customized options available	$600-$2,800
Radial Engineering	Patch Bay	TT; 1/4", 1/4" TRS	24–96	Optional	Optional	No	All options	Customized options available	$130-$1,200
Rapco	Patch Bay	TT; 1/4", 1/4" TRS	48, 52, 96	Yes	Yes	No	All options	Customized options available	$199 and up
Signal	AP Audio APB-48S	1/4" TRS (silver-plated brass)	48	Yes	Yes	Custom-izable	Rotate card 180 degrees	Add on modules (cable tester, combiner, splitter, DI)	$130
Signal	AP Audio APB-48SH	Balanced	48	No	Yes	Custom-izable	Rotate card 180 degrees	Add on modules (cable tester, combiner, splitter, DI)	$130
Switchcraft	1/4" Kit Series	1/4" TRS	48, 52	No	No	No	Full; half; no	Cable tray; nickel-plated jacks	$220
Switchcraft	Front Access Series	TT or MT	96, 48	Yes	No	No	Normals strapped, normals out	Front-panel nickel-plated jacks gold contacts	$1,100
Switchcraft	MTP Series	1/4" TRS	48	Yes	No	No	All options		$700
Switchcraft	MT52 Series	1/4" TRS	48, 52	No	No	No	Full; half; no	Tie bar, nickel-plated jacks	$230
Switchcraft	TT96 EDAC Series	TT	96	Yes	No	No	Full; normal	EDAC-type rear panel connectors	$1,300
Switchcraft	TT Kit Series	TT	96	No	No	No	Full; half; no	Cable tray; nickel-plated jacks gold contacts	$300
Switchcraft	TTP96 Series	TT	96	No	No	No	Full; half; no	Tie bar, nickel-plated jacks; gold contacts	$300
Taytrix	Audio Patch Bay	TT	96	Yes	Yes	No	Full, half, no	Customized options available	$1,500 and up
Whirlwind	WLF482	Long frame balanced	48	Optional	Yes	No	Full, half, no		$440
Whirlwind	WPB-48S	1/4" TRS	48	Yes	Yes	No	Half; no		$160
Whirlwind	WTT961	TT	96	Optional	Yes	No	Full; half user	1U rackspace	$560
Z-Systems	Digital Detanglers	AES/EBU	8-64	Yes	No	Yes	N/A	Hardware remote; computer controllable	$980-$12,000

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CD RECORDERS

CD RECORDERS

MANUFACTURER	PRODUCT	RECORD FORMATS	ANALOG I/O	DIGITAL I/O	SAMPLING RATES	DISC AT ONCE/ TRACK AT ONCE	INDIVIDUAL TRACK RECORD STOP/START	MANUAL TRACK INCREMENT	AUTO LEVEL RECORD	RECORD MUTE	TRACK NUMBERING
Denon	DN-C550R	CD-R; CD-RW	RCA I/O; XLR ins	S/PDIF (optical, coax)	44.1 kHz	Y/Y	Yes	Yes	Yes	No	Auto
HHB	CDR 830 BurnIT	CD-R	RCA	S/PDIF (coaxial & optical)	44.1 kHz	Y/Y	Yes	Yes	No	Yes	Auto
HHB	CDR 830 Plus	CD-R; CD-RW	XLR; RCA	S/PDIF (XLR, optical, coaxial)	44.1 kHz	Y/Y	Yes	Yes	Yes	Yes	Auto
HHB	CDR 850	Audio CD-R; CD-RW	XLR; RCA	S/PDIF(optical); AES/EBU	44.1 kHz	Y/Y	Yes	Yes	No	No	Yes
Marantz	Portable CD Recording System	CD-R; CD-RW	XLR; RCA	S/PDIF	44.1 kHz	Y/Y	Yes	Yes	Yes	Yes	Auto
Microboards	Copywriter Live	CD-R	XLR; RCA; 1/4"	N/A	44.1 kHz	Y/Y	Yes	Yes	Yes	No	Auto
Philips	200W Mini Shelf System with Integrated Audio CD Recorder	Audio CD-R; CD-RW	1/1	S/PDIF (RCA)	12-56 kHz	Y/Y	Yes	Yes	Yes	Yes, soft mute	Yes
Philips	Dual DeckAudio CD Recorder	Audio CD-R; CD-RW	1/2	S/PDIF (RCA, optical)	12-56 kHz	Y/Y	Yes	Yes	No	Yes, soft mute	Auto or manual
Philips	Integrated 3 CD-Changer/ CD Audio Recorder	Audio CD-R; CD-RW	1/1	S/PDIF (RCA, optical)	12-56 kHz	Y/Y	Yes	Yes	Yes	Yes, soft mute	Auto or manual
Philips	Mini 100W Shelf System with integrated CD Recorder	Audio CD-R; CD-RW	1/1 (1 mic in)	S/PDIF (RCA)	12-56 kHz	Y/Y	Yes	Yes	Yes	Yes, soft mute	Yes
Philips	Premium Audio CD Recorder	Audio CD-R; CD-RW	1 XLR/1	S/PDIF (RCA, optical)	12-56 kHz	Y/Y	Yes	Yes	No	Yes, soft mute	Yes
Philips	Single Deck Audio CD Recorder	Audio CD-R; CD-RW	1/1	S/PDIF (RCA, optical)	12-56 kHz	Y/Y	Yes	Yes	No	Yes, soft mute	Auto or manual
Sony	CDR-W33	CD-R/RW	RCA	S/PDIF (coax, optical)	44.1 kHz	N/N	Yes	Yes	No	Yes	Yes
Sony	CDR-W66	CD-R/RW	RCA; XLR	AES/EBU; S/PDIF (coax, optical)	44.1 kHz	N/N	Yes	Yes	No	Yes	Yes
TASCAM	CD-RW 4U	CD-R; CD-RW; CD-R-DA; CD-RW-DA	RCA	S/PDIF	44.1 kHz	Y/Y	Yes	Yes	Yes	Yes	Auto or manual
TASCAM	CD-RW 402	CD-R; CD-RW; CD-R-DA; CD-RW-DA; CD-DA	XLR; RCA	S/PDIF (coax, optical)	44.1 kHz	Y/Y	Yes	Yes	Yes	Yes	Auto or manual
TASCAM	CD-RW700	Audio CD-R; CD-RW	RCA	S/PDIF (RCA, optical)	44.1 kHz	N/Y	Yes	Yes	Yes	Yes	Auto or manual
TASCAM	CD-RW2000	Audio CD-R; CD-RW	XLR; RCA	S/PDIF (RCA, optical)	44.1 kHz	N/Y	Yes	Yes	Yes	Yes	Auto or manual

By Bobby Owsinski

CD SUBCODES

The PQ codes must be supplied with every master sent to the replicator.

When the CD was first developed, data known as a subcode was included along with the main data channel as a means of placing control data on the disc. The main channel was originally intended entirely for audio, not any other form of data, although it has been used for other things since.

In addition to the main data channel of a CD (which contains audio or other data), there are eight subcode channels labeled P to W that are interleaved with the main channel on the disc and available for use by CD audio and CD-ROM players. The subcodes are as follows:

P-channel indicates the start and end of each track and was intended for simple audio players that did not have full Q-channel decoding.

Q-channel contains the time codes (minutes, seconds, and frames), the Table of Contents or TOC (in the lead-in), track type, and catalog number.

Channels R to W are for subcode graphics known as CD+G and CD text that accompany the main audio data.

Except in the very special circumstances where the rare CD+G disc is being made, all subcodes except the P and Q are ignored. However, the PQ codes must be supplied with every master sent to the replicator, and therefore must be added and/or edited. Among the items that might require editing are general offsets of track ID numbers to help with universal playability (some old players take a few frames to unmute the outputs when starting to play a new track, so you need to have the ID mark happen several frames ahead of the first frame of audio), changing song times, and ISRCs. One of the reasons the

SAMPLE RATE CONVERSION	SERIAL COPY MANAGEMENT SYSTEM	RECORDING TIME DISPLAY	ERROR REPORTING	HEADPHONE JACK	REMOTE CONTROL	SCSI	DIMENSIONS	WEIGHT (LBS.)	ADDITIONAL FEATURES	PRICE
Yes	Yes	Yes	No	Yes	Yes	No	19x3.5x12.4	13.9	Dual player/recorder; HDCD compatible; data or audio discs2	$899
Yes	No	Yes	Yes	Yes	Yes	No	19x11.6x4.1	7.7	24-bit converters; CD text; digital input; gain control	$569
Yes	Yes	Yes	Yes	Yes	No	No	19x11.62x3.50	8.10	Word clock input	$649
Yes	Yes	Yes	Yes	Yes	No	No	2U rack-mount	N/A	Timecode; adjustable auto-stop delay	$995
Yes	No	Yes	Yes	Yes	Yes	No	11x9x4	7	48V phantom power; 3-band EQ; HP and LP filters; jog wheel	$849
No	No	Yes	Yes	Yes	Yes	No	16.93x11.42x4.13	9.9	Records CD audio and CD video	$799
Yes	Yes	Yes	Yes	Yes	Yes	No	10.4x12.2x 13.2 (set); 9.4x12.2x9.8 (speakers)	48.5	Automatic volume equalization	$499
Yes	Yes	Yes	Yes	Yes	Yes	No	17.1x3.46x12.2	11		$399
Yes	Yes	Yes	Yes	Yes	Yes	No	17.1x5.6x14.5	16.8	Mic input; automatic volume equalization	$449
Yes	Yes	Yes	Yes	Yes	Yes	No	10.4x12.2x13.2 (set); 9.4x12.2x9.8 (speaker)	48.5	Automatic volume equalization	$399
Yes	Yes	Yes	Yes	Yes	Yes	No	17.1x3.46x12.2	9.9		$449
Yes	Yes	Yes	Yes	Yes	Yes	No	17.1x 3.46x12.2	8.82		$299
Yes	Yes	Yes	Yes	Yes	Yes	No	19x 3.5x10.5	10	DSP function; wired/wireless remote	$799
Yes	Yes	Yes	Yes	Yes	Yes	No	19x 3.5x10.5	10	DSP function; wired/wireless remote; RS-232C and parallel (GPI) control ports	$1,275
Yes	Yes	Yes	Yes	Yes	Yes	No	8.5x3.3x12.2	7.25		$479
Yes	Yes	Yes	Yes	Yes	Yes	No	19x10.5x5.25	N/A	Track editing; supports CD-text; parallel controller port; duplicator up to 4x; overburning (if disc supports it)	$1,249
Yes	Yes	Yes	Yes	Yes	Yes	No	19x3.85x12.3	14.5	Remote; coaxial/optical digital I/O; adjustable digital gain	$749
Yes	Yes	Yes	Yes	Yes	Yes	No	19x3.85x12.3	15.2	AES/EBU, coaxial, optical digital I/O; word clock	$1,125

Client: Test Records
Project: Sample
Title: Sample
Date: March 6, 2000
Studio: Test Mastering

Disc Type: Audio
Time Format: 30/NDF
PQ Track 1 Offset: 00:00:00:10 PQ StartOffset: 00:00:00:10
PQ SpliceOffset: 00:00:00:06 PQ End/Offset: 00:00:00:02
PQ MinIndex0Width: 00:00:01:00 UPC/EAN CODE: 0000000000000
PQ Track/Index Information:

T-X TITLE/ISRC COPY EMPH D/A NO OFFSET TIME hh:mm:ss:ff	OFFSET TIME hh:mm:ss:ff	DURATION mm:ss:ff	CD TIME
0 Pause	00:01:58:00	00:01:57:20:	00:00:02:00 00:00:00
1 Suffering & Smiling—Part 1&2	00:02:00:00	00:01:59:20:	00:21:31:02 00:02:00
TOTAL:	00:21:33:02		
2 GBCNP7780130 OFF OFF A			
0 Pause	00:23:30:20	00:23:30:22	00:00:02:08 21:33:05
1 No Agreement—Album	00:23:33:10	00:23:33:00	00:15:30:00 21:35:25
TOTAL:	00:15:32:08		
3 GBCNP7780140 OFF OFF A			
0 Pause	00:39:02:28	00:39:03:00	00:00:01:18 37:05:25
1 Dog Eat Dog—Album	00:39:04:28	00:39:04:18	00:15:32:18 37:06:70
TOTAL:	00:15:34:06		
Lead-out	00:54:37:04	00:54:37:06	52:39:40

Total: 00:52:39:16

FIG. 1: A typical PQ log.

Sonic Solutions DAW is so popular for mastering is because it has a built-in PQ editor.

Usually a PQ log is printed out and sent with the master to the replicator as a check to ensure that the correct songs and ISRCs have been provided. Also, when making a master (1630, DDP, PMCD), the PQ info is put on the master somewhere separate from the audio so the plant can read it, check it against the PQ log you provide, and use it to cut the glass master (see Fig. 1). ■

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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	DEESSER
Antares	Vocal Processor	2/N	Solid state	1/4"; XLR/(2) 1/4"	N/A	2-band parametric	HP; LP	Solid state	Yes	Yes	Yes
A.R.T.	Pro Channel	1/N	Tube	XLR; 1/4"	N/A	4-band parametric w/sweep mids	HP variable	Optical tube/ variable mu	No	No	No
A.R.T.	Tube Channel	1/N	Tube	XLR; 1/4"	N/A	4-band parametric w/sweep mids	No	Optical tube	No	No	No
Avalon Design	VT-737SP	1/Y	Tube (Class A)	XLR; 1/4" TRS in/XLR out	N/A	4-band parametric	HP	Optical Class A tube	No	No	Yes
Barbetta	Channel One	1/N	Solid state	XLR; 1/4" TRS in/XLR out	N/A	3-band parametric	Subsonic; ultrasonic	Full-function	No	Yes	No
Behringer	Ultra-Voice Pro VX2000	1/N	Tube emulation	XLR, 1/4" TRS	N/A	3-band parametric	HP	Opto-compressor	Yes	Yes	Yes
Boss	VT-1 Voice Transformer	1/N	N/A	1/4"	S/PDIF (coaxial)	N/A	No	N/A	No	No	No
dbx	286A	1/N	Solid state	XLR, 1/4" TRS	N/A	2-band enhancer	HP	Overeasy	Yes	Yes	Yes
dbx	376 Tube Channel Strip	2/N	Tube	XLR; 1/4"	AES/EBU	3-band parametric	HP	VCA	No	No	Yes
dbx	ProVocal	1/N	Digital	XLR	AES/EBU	3-band parametric	No	Digital	No	Yes	Yes
Drawmer	MX60 Front End One	1/N	Solid state	XLR, 1/4" TRS	N/A	3-band: high/low shelving; center parametric	HP 100 Hz	Soft knee	Yes	Yes	Yes
Focusrite	ISA220	1/Y	Solid state	XLR	Optional 24/96 A/D	4-band (2 parametric)	HP; LP	Discrete (Class A)	No	No	Yes
Focusrite	OctoPre	8/N	Solid state (Class A)	XLR, 1/4" TRS via D-sub	Optional: 24/96 Toslink; S/PDIF; AES/EBU	N/A	No	Optical (8)	No	No	No
Focusrite	Platinum 1 VoiceMaster	1/N	Solid state	XLR; 1/4"	N/A	4-band	HP	Optical	Yes	Yes	Yes
Focusrite	Trak Master	1/N	Solid state (Class A)	XLR, 1/4"	Optional 24/96	3-band, switchable for voice/instrument	No	Optical	No	No	No
HHB	Radius 5 Fatman 2	1/N	Tube	XLR, 1/4" TRS	N/A	N/A	HP 90 Hz	Tube	No	No	No
HHB	Radius 40	1/N	Solid state/tube	XLR, 1/4"	N/A	4-band parametric	HP 90 Hz	Analog	Yes	Yes	No
HHB	Radius 50	1/Y	Tube	Mic, line, instrument	N/A	Low-cut filter	No	Tube	No	No	No
Joemeek	MQ 3	1/N	Current sense	1/4"	N/A	3-band fixed	No	Optical	No	No	No
Joemeek	Twin QCS	2/Y	Current sense	XLR	S/PDIF (optional)	3-band fixed	HP	Optical	No	No	No
Joemeek	VC1Q Studio Channel	1/N	Transformer-coupled	XLR, 1/4"	Optional	3-band with mid sweep	HP	Photo-optical	Yes	No	Yes
LA Audio	MLX20	2/N	Solid state	XLR; 1/4" TRS	N/A	N/A	Sweepable HP	N/A	No	No	No
LA Audio	MPX10 Mono Multi-Processor	1/N	Solid state	XLR, 1/4" TRS	N/A	4-band w/sweep high/low	HP 75 Hz; LP 12 kHz	Solid state	Yes	No	Yes
LA Audio	PS10	1/N	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 w/variable rate	Yes	No	Yes
LA Audio	PS10D	1/N	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	Yes	No	Yes
Langevin	Langevin Dual Vocal Combo	2/Y	All-discrete	XLR, 1/4"	N/A	High/low shelving	No	Electro-optical	No	No	No
Manley Labs	Voxbox	1/Y	Tube	XLR, 1/4"	N/A	3-band Pultec-style	HP 80 Hz, 100 Hz	Optical	No	No	Yes
Millennia Media	STT-1 Origin	1/Y	Solid state and tube (switchable)	XLR, 1/4"	N/A	4-band parametric	No	Opto-compressor/ limiter	No	No	Yes
Oram Pro	MWS Microphone Work Station	2/N	Solid state	XLR	N/A	Series 24 console EQ	HP; LP	N/A	No	No	No
Pendulum	Quartet	1/Y	Tube	XLR; 1/4"	N/A	3-band modified Baxadall	HP	Optical	No	No	Yes
PreSonus	VXP Dynamic Voice Processor	1/N	Class A, discrete	XLR, 1/4" TRS	N/A	4-band semi-parametric	HP	VCA, variable soft-knee to hard limit	Yes	No	Yes
Rane	VP12	2/N	Solid state	XLR, 1/4" TRS	N/A	2-band parametric	HP; LP	Solid state	Yes	Yes	Yes
SPL Electronics	Channel One	1/N	Tube	XLR; 1/4"	N/A	3-band parametric	Proportional Q	SPL Double VCA	No	Yes	Yes
Symetrix	528E Voice Processor	1/N	Solid state	XLR	N/A	3-band parametric	No	Analog	Yes	No	Yes
TC-Helicon	Gold Channel	2/Y	Digital	XLR	AES/EBU; S/PDIF; ADAT	5-band parametric	No	Digital	Yes	No	Yes
TC-Helicon	VoiceOne	2/N	N/A	XLR	S/PDIF	"Spectra" modeling EQ curves	Fixed and floating lowcut	N/A	No	No	No
TC-Helicon	VoicePrism	1/N	Solid state	1/4" TRS	S/PDIF output	2-band parametric	LP; HP	Digital	No	Yes	No
TC-Helicon	VoicePrismPlus	1/N	Solid state	1/4" TRS	AES/EBU; S/PDIF	4-band parametric	LP; HP	(2) Digital	No	Yes	No
TL Audio	VP-1	1/Y	Tube or solid state (Class A)	XLR; 1/4"	AES/EBU or S/PDIF (optional)	4-band parametric	HP variable	Tube or optical	Yes	Yes	Yes

SIDECHAIN	BYPASS	METER TYPE	FREQUENCY RESPONSE	DYNAMIC RANGE	THD	DIMENSIONS (INCHES)	WEIGHT (LBS.)	SPECIAL FEATURES	PRICE
No	Yes	5-seg LED	10 Hz-20 kHz	N/A	>0.005%	19x1.75x5	4.5	Stereo double-tracking; tube modeling; mic modeling	$595
No	Yes	LED; VU	20 Hz–20 kHz	>100 dB	<0.1%	19x6.5x3.5	12	Preamp/comp/EQ inserts; selectable metering	$799
No		LED; VU	20 Hz–20 kHz	>90 dB	<0.1%	19x5.25x1.75	8	Preamp/comp/EQ inserts; selectable metering	$499
Yes	No	VU; LEDs	1 Hz-200 kHz	148 dB	0.05%	19x12x3.5	26	Fully-discrete Class A tubes; EQ switch	$2,699
No	Yes	VU; LED	3 Hz–20 kHz	>94 dB	0.001%	1RU	6.5	Phantom powered	$799
No	Yes	Gain reduction and output LEDs	10 Hz-200 kHz	N/A	0.02% mic; 0.002% line	19x8.5x1.75	N/A	Enhancer; recording output; 4580 operational amplifiers	$159
No	Yes	LED	N/A	N/A	N/A	7x2.06x6.37	1.1	Realtime pitch and formant control, with presets and user controls	$395
Yes	Yes	LED	20 Hz-20 kHz	105 dB	0.005%	19x7.5x1.75	5	Phantom powered	$300
Yes	No	LED	20 Hz-20 kHz	>107 dB	0.003%	19x8.25x1.75	N/A		$600
No	Yes	LED	20 Hz-22 kHz	103 dB	0.003%	19x1.75x5.75	7.14	Delay; chorus; mic modeling; preamp modeling	$450
No	Yes	LED	20 Hz-20 kHz	N/A	<0.01%	1RU	9	Instument input with 20 dB pad	$725
Yes	Yes	VU; LED	10 Hz-140 kHz	N/A	0.001%	19x1.75x6	N/A	Blend feature on compressor	$2,295
No	Yes	LED	20 Hz-200 kHz	N/A	0.0002%	19x1.75x6	N/A	Phantom power; word clock; (2) instrument inputs with phase reverse	$1,169
No	Yes	LED	10 Hz-200 kHz	N/A	0.002%	1RU	N/A	Tube emulation circuitry	$675
No	Yes	LED	20 Hz-200 kHz	N/A	0.0003%	1RU	N/A	Tube sound circuit	$450
No	Yes	Output or gain reduction VU	5 Hz-40 kHz	N/A	0.5%	8.5x8.3x5.25	7.75	15 presets; manual mode	$469
Yes	Yes	VU	10 Hz-40 kHz	106 dB	N/A	19x7.9x3.5	5.5	Gain control; 2 units stereo linkable	$749
No	Yes	Output	20 Hz–40 kHz	100 dB	0.05%	2RU	N/A		$469
No	Yes	Input on LED	20 Hz-20 kHz	115 dB	0.006%	1/2RU	4	Insert and mix inputs	$299
No	Yes	Input/gain reduction	20 Hz-20 kHz	115 dB	0.006%	2RU	9		$999
No	Yes	VU	10 Hz-50 kHz	N/A	0.01%	2RU	9	Phase reverse; phantom powered	$800
No	No	LED	20 Hz-20 kHz	N/A	<0.05%	19x6x1.75	5	Phantom powered; -10/+4dB operation	$320
No	Yes	LED	20 Hz-20 kHz	N/A	<0.05%	19x6x1.75	4.8	Phantom powered; -10/+4dB operation	$400
No	Yes	LED	20 Hz-20 kHz	N/A	<0.05%	19x6x1.75	N/A	Phantom powered; -10/+4dB operation	$850
No	Yes	LED	20 Hz-20 kHz	N/A	<0.05%	19x6x1.75	N/A	Phantom powered; -10/+4dB operation	$1,150
No	Yes	VU	10 Hz–60 kHz	127 dB	<0.04%	19x3.5x10	12	All discrete; direct injection and limiter inputs	$2,000
Yes	Yes	VU	10 Hz-100 kHz	>117 dB	0.3%	19x5.25x10	21	All tube	$4,000
Yes	Yes	VU	5 Hz-300 kHz, +0/-3 dB	N/A	<0.002%	19x12.5x3.5	22	Provides 100% Class A, all-discrete J-FET solid state topology or 100% Class A, all triode vacuum tube topology	$2,895
No	Yes	LED	20 Hz–20 kHz	N/A	0.005%	N/A	N/A	Phantom; unity gain padless front end	$2,590
No	Yes	VU output/ compression	20 Hz-100 kHz	>90 dB	N/A	19x3.5x12	14		$3,250
No	Yes	LEDs	20 Hz–40 kHz	116 dB	0.001%	19x8x1.75	8	Class A, transformer-coupled input with dual servo gain stage	$800
No	Yes	LED;	20 Hz–20 kHz	N/A	0.01%	1RU	N/A	Phantom powered; mic/line mix control	$599
Yes	Yes	Output PPM	10 Hz–100 kHz	119 dB	0.01855%	19x3.5x8	4.15	Headphone jack, mic/line/instrument inputs	$1,599
Yes	Yes	Gain reduction LED	20 Hz-20 kHz	N/A	<0.08%	19x8x2	9	Voice symmetry; phantom power	$749
No	Yes	LED	10 Hz-20 kHz	>103 db	0.003%	1RU	5.5	Digital radiance generation; time alignment	$2,495
No	Yes	Input and output LED ladders	20 Hz-20 kHz	100 dB	0.0025%	19x1.75x8.2	4.11	Voice modeling; hybrid ptich shifting; realtime pitch correction; pitch and phrase naturalization	$1,299
No	Yes	Input LED ladders	20 Hz-20 kHz	-95 dB	0.0065%	19x3.5x8.2	7.81	4-voice formant and pitch processor; lead voice doubletrack and harmonization; delay; chorus; flange; reverb	$1,499
No	Yes	Input LED ladder	20 Hz-20 kHz	-97 dB	0.008%	19x3.5x8.2	7.9	Voice modeling; 4-voice harmonization with independent humanizing controls	$1,899
Yes	Yes	Input, output, or gain reduction VU	20 Hz-20 kHz			19x10x5.25	20	Optional digital output	$2,999

SEE PAGE 174 FOR A COMPLETE LISTING OF MANUFACTURERS' CONTACT INFORMATION

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
Aardvark	Aark 24 - PC Interface	N/A	S/PDIF (RCA, optical); ADAT (optical)	Win 95/98	PCI	DirectX; GSIF; ASIO 2	32, 44.1, 48 kHz	24-bit
Aardvark	Direct Mix USB3	(2) 1/4" line I/O; 1/4" mic/guitar input	N/A	Win 95/98; Mac OS 9.04	USB	N/A	44.1, 48 kHz	24-bit
Aardvark	Direct Pro 24/96 Personal Studio	(4) XLR; (4) 1/4"; (2) RCA	S/PDIF (RCA)	Win 95/98	PCI	DirectX; GSIF; ASIO 2	32, 44.1, 48, 96 kHz	24-bit
Aardvark	Direct Pro LX6	(4) 1/4" line inputs; (6) line outputs	S/PDIF (RCA)	Win 95/98	PCI	DirectX; GSIF; ASIO 2	32, 44.1, 48, 96 kHz	24-bit
Aardvark	Direct Pro Q-10	(8) XLR mic/ (8) 1/4" line inputs	S/PDIF (RCA)	Win 95/98	PCI	DirectX; GSIF; ASIO 2	32, 44.1, 48, 96 kHz	24-bit
Alesis	ADAT/EDIT 2.0	ADAT Optical	ADAT optical	Win 95/98/NT/ 2000/NP; Mac	PCI	N/A	44.1, 48 kHz	N/A
Antex	SC22	2/2	N/A	Win 95/98/NT	PCI	N/A	6.25-50 kHz	20-bit
Antex	SC2000	(4/4) XLR	XLR AES/EBU; S/PDIF	Win NT/2000/XP	PCI	N/A	6.25-50 kHz	20-bit
CreamWare	Elektra	Stereo in/out	S/PDIF	Win	PCI	Proprietary	22-96 kHz	24-bit/96 kHz
CreamWare	Luna II	Stereo in/out	S/PDIF	Win	PCI	Proprietary	22-96 kHz	24-bit/96 kHz
CreamWare	PowerSampler	Stereo in/out	S/PDIF	Win	PCI	Proprietary	22-96 kHz	24-bit/96 kHz
CreamWare	Pulsar 1.31	2	(2) ADAT; S/PDIF	Win	PCI	Proprietary	22, 32 44.1, 48, 96 kHz	A/D 20-bit; D/A 24-bit
CreamWare	Pulsar II	2	(2) ADAT; S/PDIF	Win	PCI	Proprietary	22, 32 44.1, 48, 96 kHz	A/D 20-bit, D/A 24-bit
CreamWare	Pulsar XTC	Optional	Optional	Win	PCI	Proprietary	22-96 kHz	N/A
CreamWare	TripleDAT	2	(2) S/PDIF	Win	ISA	TripleDat	32 44.1, 48 kHz	18-bit
CreamWare	TripleDAT 2.5	2	(2) S/PDIF	Win	ISA	TripleDat	32, 44.1, 48 kHz	18-bit
Creative Labs	Sound Blaster Live	1/8" mic/line	S/PDIF	Win 95/98/NT	PCI	EAX	8-48 kHz	16-bit
Digidesign	Digi 001	(2)XLR; (6)1/4" TRS	ADAT; (2) S/PDIF	Mac; Win	PCI	RTAS; AudioSuite	44.1, 48 kHz	24-bit
Digidesign	Digi 001 Factory	(2)XLR; (6)1/4" TRS	ADAT; (2) S/PDIF	Mac; Win	PCI	RTAS; AudioSuite	44.1, 48 kHz	24-bit
Digidesign	Digi 96/8	N/A	ADAT; S/PDIF; AES/EBU	Win 98/ME/2000; Mac	PCI	VST; Direct X	32, 44.1, 48, 64, 88.2, 96 kHz	N/A
Digidesign	Digi 96/8 Pad	1/4" stereo	ADAT; S/PDIF; AES/EBU	Win 98/ME/2000/XP; Mac	PCI	VST; Direct X; ASIO	32, 44.1, 48, 64, 88.2, 96 kHz	24-bit
Digidesign	Digi 96/8 PST	1/4" stereo	ADAT; S/PDIF; AES/EBU	Win 98/ME/2000/XP; Mac	PCI	VST, Direct X	32, 44.1, 48, 64, 88.2, 96 kHz	24-bit
Digidesign	Mbox	(2) XLR-1/4" TRS combo; 1/4" TRS	(2) S/PDIF	Mac/Win	USB	RTAS; AudioSuite	44.1, 48 kHz	24-bit
Digidesign	Pro Tools 24 Mix/Mix Plus	8–72 channels	8–72 channels	Win 98; Mac	PCI	RTAS; TDM; AudioSuite	48, 44.1 kHz	24-bit (with 888/24 I/O interface)
Digidesign	Pro Tools HD 1,2 &3	(Up to 96 channels)	(Up to 96 channels)	Mac; Win	PCI	TDM; HTDM; RTAS; AudioSuite	44.1, 48, 88.2, 96, 176.4,192 kHz	24-bit
Digigram	VX222	(2/2) XLR	(2/2) S/PDIF; AES/EBU	Win; Mac	PCI	N/A	8–48 kHz	24-bit
Digigram	VX Pocket 440	(4/4) XLR	(2/2) S/PDIF (coax)	Win; Mac	PC CARD	DirectX	8–48 kHz	24-bit
Digital Audio Labs	CardDeluxe	(2/2) 1/4" TRS (gold tipped RCA)	S/PDIF	Win	PCI	Active Movie; DirectX	8–48 kHz	24-bit/128x/ 24-bit/64x
Echo	Mia	(2/2) 1/4" TRS, 8 virtual out	S/PDIF (coaxial)	Win 95/98/ME/ 2000; Mac	PCI	N/A	8–96 kHz	24-bit
Echo	Gina24	(2/8) 1/4"	S/PDIF; ADAT	Win 95/98/ME/NT 2000; Mac	PCI	N/A	8–96 kHz	24-bit
Echo	Layla24	(8/8) 1/4"	S/PDIF; ADAT	Win 95/98/ME/NT 2000; Mac	PCI	N/A	8–96 kHz	24-bit
Echo	Mona	(4/6) universal XLR	S/PDIF; ADAT	Win 95/98/ME/NT 2000; Mac	PCI	N/A	8–96 kHz	24-bit
Edirol	DA-2496 Audio Interface	(8/8)(2)1/4"–XLR combo; (6) 1/4" TRS ins/ (8) 1/4" TRS outs; 1/4" headphone	S/PDIF (optical, coaxial)	Win, Mac	PCI	N/A	8-96 kHz	24-bit A/D; 24-bit D/A
Edirol	UA-1A USB Audio Interface	(2/2) RCA	N/A	Win; Mac	USB	N/A	44.1 kHz	16-bit A/D; 16-bit D/A

DIGITAL RECORDER RESOLUTIONS (MAX)	SYNC TYPES	MIDI CONTROL	TRACKS / VIRTUAL TRACKS	# OF LOCATE POINTS	EFFECTS / DYNAMIC PROCESSING	ADDITIONAL FEATURES	PRICE
24-bit	Word clock; S/PDIF; ADAT	Yes	N/A	N/A	N/N	Shielded box and PCI card; Steinberg ASIO drivers; DSP monitor mixer	$[illegible]99
24-bit	N/A	No	N/A	N/A	N/N	HIZ guitar/instrument input; headphone volume slider and jack	$299
24-bit	MTC; S/PDIF	Yes	N/A	N/A	Y/Y	Including compressor, reverb, 3-band EQ	$699
24-bit	MTC; S/PDIF	Yes	N/A	N/A	Y/Y	Digital patch bay; presets; 10-channel mixer; VU meters; 3-stage input trim	$499
24-bit	MTC; S/PDIF; word clock	Yes	N/A	N/A	Y/Y	Digital patch bay; presets; 10-channel mixer; VU meters	$999
24-bit	ADAT sync in/out	Yes	16/8	16 (ADAT/ connect)	Y/Y	Sample-accurate transfer; zero latency monitoring; ASIO 2.0 support	$399
N/A	LTC; VITC	No	4	N/A	N/N	Multi-card capability; Wintel & Alpha processor compatible	$595
N/A	SMPTE read/write, video	Yes	N/A	N/A	N/N	Video burning	$895
24-bit/96 kHz	N/A	In/out	N/A	N/A	Y/Y	Ultra-low-latency interface with drivers	$598
24-bit/96 kHz	N/A	In/out	N/A	N/A	Y/Y	Ultra-low-latency interface with drivers; (3) SHARC DSPs; 24-ch mixer, 16-ch surround mixer	$398
24-bit/96 kHz	N/A	In/out	N/A	N/A	Y/Y	Resonant filters; editing features; Multi mode	$598
24-bit	Optional sync. plate available	No	N/A	N/A	Y/N	Mixing and routing capabilities	$1,298
24-bit	Optional sync. plate available	No	N/A	N/A	Y/N	Mixing and routing capabilities	$1,398
N/A	N/A	No	N/A	N/A	Y/Y	Virtual synths; VST-based sampler	$999
16-bit	MIDI time code; MIDI clock; word clock	No	0/256	99	Y/Y	CD writing; warp mode on analog and digital chans simultaneously	$920
16-bit	MTZ, MIDI clock, word clock	No	0/256	99	Y/Y	CD writing; moves effects presets to/from ext devices; simultaneously digital/analog channels	$920
16-bit	MIDI	No	N/A	N/A	Y/Y	Includes Cakewalk, Sound Forge, Mixman software and digital I/O card	$199
24-bit	ADAT; S/PDIF	Yes	24/0	Unlimiited	Y/Y	Two mic pres; 48V phantom; MIDI I/O; includes Pro Tools LE software	$995
24-bit	ADAT; S/PDIF	Yes	24/N/A	Unlimiited	Y/Y	Two mic pres; 48V phantom; MIDI I/O; includes Pro Tools LE software	$1,345
24-bit	N/A	No	8-channel	N/A	N/N	Digicheck software	$395
24-bit	N/A	No	8-channel	N/A	N/N	Digicheck software	$635
24-bit	N/A	No	8-channel	N/A	N/N	Digicheck software	$570
24-bit	N/A	Software only	24/N/A	Unlimited	Y/Y	Focusrite pres; 48V phantom; 2 1/4" inserts; headphone jacks; zero-latency monitoring; includes Pro Tools LE software	$495
N/A	LTC; VITC; MTC; BIPhase; Pilot Tone; AES, EBU; S/PDIF; ADAT	Yes	64/128	Unlimited	Y/Y	ProControl support; Control/24 support; DigiRack plug-ins (EQ, dynamics, delay, time comp/exp, pitch shift) included	$5,995–$7,995
24-bit	LTC, VITC, MTC; BiPhase; Pilot Tone; AES/EBU; S/PDIF; ADAT	With MIDI I/O peripheral	128/ 0	Unlimiited	Y/Y	Pro Tools software; ProControl and ProControl 24; Digidesign plug-ins	$7,995-$11,995
24-bit	N/A	No	N/A	N/A	N/N		$549
24-bit	SMPTE (LTR)	No	N/A	N/A	N/N		$999
24-bit	Internal; ext. digital	No	N/A	N/A	N/N	Multiple card support	$399
24-bit	S/PDIF	No	N/A	N/A	N/N	8 virtual outputs; GSIF; WDM	$249
24-bit	Esync, S/PDIF, ADAT	No	N/A	N/A	N/N	Headphone output; GSIF; WDM	$495
24-bit	Word; MTC; S/PDIF; ADAT	Yes	N/A	N/A	N/N	Headphone output; GSIF; WDM	$995
24-bit	Word; S/PDIF; ADAT	No	N/A	N/A	N/N	4 built-in mic pre amps; phantom power; headphone	$995
24-bit	N/A	No	8 mono/4 stereo	N/A	N/N	Phantom power; 24 db pad; 8 in/out gain controls; 8 peak indicators; WDM & ASIO drivers; MIDI I/O; Word Clock I/O	TBA
16-bit	N/A	No	2 mono/1 stereo	N/A	N/N	USB powered	$99

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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
Edirol	UA-1D USB Audio Interface	N/A	S/PDIF (optical); 5.1 surround	Win; Mac	USB	N/A	32/44.1/48 kHz in; 48 kHz out	N/A
Edirol	UA-3	RCA in/out; 1/4" guitar/ mic; 1/8" headphone	S/PDIF (optical)	Win 98/2000/ME; Mac OS9	USB	N/A	44.1 kHz	20-bit A/D/A
Edirol	UA-3D USB	(2/2) RCA; 1/4" guitar	S/PDIF (optical)	Win; Mac	USB	N/A	44.1 kHz	20-bit A/D; 20-bit D/A
Edirol	UA-5 USB	(2/2) RCA; 1/4"-XLR combo; 1/4" headphone	(2/2) S/PDIF (optical, coax)	Win; Mac	USB	N/A	44.1, 48, 96 kHz	24-bit
Edirol	U-8 USB Digital Studio	XLR; 1/4" guitar in/ RCA in/out	S/PDIF (optical) I/O	Win 98; Mac	USB	DirectX; VST	44.1 khz	20-bit
Edirol	UA-20 USB MIDI/Audio	(2/2) (2)1/4"–XLR combo; 1/4" guitar ins/ (2) RCA; (2) 1/4" outs; 1/8" headphone	S/PDIF (optical, coaxial)	Win; Mac	USB	N/A	44.1/48/96 kHz	24-bit A/D; 24-bit D/A
Edirol	UA-30 USB Audio Interface	RCA in/out; 1/4" guitar/mic	S/PDIF (coax, optical)	Win 98/2000; Mac	USB	DirectX; VST	44.1, 48 kHz	20-bit
Edirol	UA-100 Audio Canvas	RCA; 1/4" (guitar/mic)	S/PDIF (optical) out	Win 98; Mac	USB	DirectX; VST	44.1 khz	20-bit
Edirol	UA-700 USB	(2/2) (2) 1/4"–XLR combo-outs; (2) RCA; (2) 1/4" outs; 1/4" headphone	S/PDIF (optical, coaxial)	Win; Mac	USB	N/A	44.1/48/96 kHz	24-bit A/D; 24-bit D/A
Ego-Sys	Waveterminal 2496	(2 x 2) 1/4" TRS	(2 x 2) S/PDIF (coaxial)	Win 95/98/2000; Mac	PCI	DirectX	8 –96 kHz	24-bit
Ego-Sys	Waveterminal U24	(2 x 2) 1/4"	(2 x 2) S/PDIF (coaxial, optical)	Win 98/2000	USB	DirectX	32, 44.1, 48 kHz	24-bit
Emagic	EMI 2/6	(2/6) RCA	(2/2) S/PDIF (coaxial)	Win ME/98/; Mac	USB	DirectX; VST	44.1, 48 kHz	24-bit
Event Electronics	EZ8	N/A	(8x8) ADAT	Win 95/98/ME/XP	PCI	N/A	44.1, 48, 88.2, 96 kHz	N/A
Event Electronics	EZbus	(2) XLR; (18) 1/4" TRS/ (6) 1/4" TRS; headphone	ADAT; S/PDIF (optical, coax)	Win; Mac	USB	N/A	44.1, 48, 88 2, 96 kHz	24-bit
Frontier Design	Dakota	(8/8) or (16/16) (avail. with Tango 24)	(16/16) ADAT, (2x2) S/PDIF	Win 95/98/ME; Mac	PCI	N/A	44.1 or 48 kHz	24-bit on Tango 24
Frontier Design	WaveCenter/PCI	(8/8) (avail. with Tango 24)	(8/8) ADAT; S/PDIF (Toslink or RCA)	Win 95/98/ME; Mac	PCI	N/A	44.1 or 48 kHz	24-bit on Tango 24
HHB	Lynx L22	(2/2) XLR	(2/2) S/PDIF or AES/EBU	Win 98/ME/NT/ 2000/XP; Mac	PCI	ASIO 2.0	44.1-192 (200 max) kHz	24-bit
Lynx	LynxONE	(2/2)	(2) AES/EBU or S/PDIF	Win 95/98/NT/ 2000; Mac; Linux	PCI	N/A	8–48 kHz (analog); 32–96 kHz (digital)	24-bit
Lynx	LynxTWO	(4/4)	(4/4) ADAT; TDIF	Win 95/98/NT/ 2000; Mac; Linux	PCI	N/A	8–192 kHz (analog); 32–96 kHz (digital)	24-bit
Mackie Designs	Mixtreme	Up to 16 with optional interface	(2) 8-ch TDIF (S/PDIF optional)	Win 95/98/NT4/2000	PCI	Soundscape Real Time DSP	Up to 48, 96 k Hz with ext super clock	24-bit
Mackie Designs	Soundscape 32	(2) XLR/(4) XLR	24-ch. TDIF I/O	Win 95/98/NT/2000/ME	N/A	Soundscape Real Time DSP	Up to 96 kHz	24-bit
M Audio	Audiophile 2496	(2x2) RCA	S/PDIF (coaxial)	Win 95/98/2000; Mac; Linux	PCI	Direct X; VST	8–96 kHz	24-bit/128x
M Audio	Audiosport Quattro	(4x4) 1/4" TRS	N/A	Win ME/2000; ASIO 1/2	USB	Direct X; VST	44.1, 48, 96 kHz	24-bit/128x
M Audio	Delta 1010	(8/8) 1/4" TRS	(2/2) S/PDIF (coax)	Win 95/98/SE/NT/2000/ ME/XP: Mac OS 8.6-X	PCI	VST; GSIF; DXi; ASIO; EASI; WDM	8-96 kHz	24-bit
M Audio	Delta 1010 LT	(8/8)	(2) S/PDIF	Win 95/98/SE/NT/2000/ ME/XP; Mac OS 8.6-X	PCI	VST; DXi; GSIF; ASIO; WDM; RA	8-96 kHz	24-bit
M Audio	Delta Audiophile 2496	(2/2) RCA	(2/2) S/PDIF (coax)	Win 95/98/SE/NT/2000/ ME/XP, Mac OS 8.6-X	PCI	VST; GSIF; DXi; ASIO; EASI; WDM	8-96 kHz	24-bit
M Audio	Delta TDIF	Stereo	TDIF; S/PDIF	Win 95/98/2000/NT/; Mac; Linux	PCI	Direct X; VST	8–96 kHz	24-bit/128x
M Audio	Omni Studio	(4x4) 1/4" TRS	(2x2) S/PDIF (coaxial)	Win 95/98/2000/NT/; Mac; Linux	PCI	Direct X; VST	8–96 kHz	24-bit/128x
Merging Technologies	PyraMix Virtual Studio 4.0	Optional 24-bit/96 kHz	ADAT; S/PDIF; MADI; AES/EBU; TDIF	Win NT/2000	PCI	Native; DirectX	32–92 kHz	24-bit
Micro Technology	MicroSound/ Krystal	2/2	AES/EBU; S/PDIF	Win	PCI	DirectX	8–48 kHz	16-bit
Midiman	DMan PCI	(2/2) RCA	N/A	Win 95/98/NT	PCI	MME; DirectX	44.1, 48 kHz	18-bit

DIGITAL RECORDER RESOLUTIONS (MAX.)	SYNC TYPES	MIDI CONTROL	TRACKS / VIRTUAL TRACKS	# OF LOCATE POINTS	EFFECTS / DYNAMIC PROCESSING	ADDITIONAL FEATURES	PRICE
16-bit	N/A	No	2 mono/1 stereo	N/A	N/N	USB powered; WinDVD	$119
16-bit	N/A	No	2 mono/1 stereo	N/A	N/N	USB Powered	$225
16-bit	N/A	No	2 mono/1 stereo	N/A	N/N	1/8" mic; 1/8" headphone; 5.1 surround; Cool Edit Pro LE	$249
24-bit	N/A	No	2 mono/1 stereo	N/A		Phantom power; in/out gain controls; peak indicators; WDM and ASIO drivers	$375
N/A	MIDI	Yes	2 mono/1 stereo	N/A	Y/N	Includes Cool Edit Pro LE for Windows	$379
24-bit	N/A	Yes	2 mono/1 stereo	N/A	Y/Y	Phantom power; 24 db pad; in/out gain controls; peak indicators, WDM & ASIO drivers; MIDI I/O; mix 5 analog ins with guitar amp, mic modeling, and effects	$225
N/A	N/A	No	2 mono/1 stereo	N/A	N/N	Includes Cool Edit Pro LE for Windows	$225
N/A	MIDI	No	2 mono/1 stereo	N/A	Y/N	Built-in MIDI interface; includes software synthesizer	$595
24-bit	N/A	Yes	2 mono/1 stereo	N/A	Y/Y	Line/mic in; 1/4" guitar in; ASIO drivers; phantom power	$615
24-bit	Word clock, S/PDIF	No	N/A	N/A	N/N	ASIO 2.0, EASI, and GSI/F drivers	$249
16/24-bit	S/PDIF	No	N/A	N/A	N/N	4-ch full duplex in and out (analog and digital)	$299
24-bit	Word clock	No	Software dependent	N/A	N/N	N/A	$399
24-bit	N/A	No	8/0	N/A	N/N	S/MUX mode for 4-ch 24-bit/96kHz operation; software control panel for levels, monitoring, sample-rate selection, S/MUX selection	$199
24-bit/96 kHz	Word clock (output)	Yes	N/A	8	Y/Y	Functions as control surface for DAWs; functions as a stand-alone digital mixer (no computer required); dual MIDI ports; automatic error detection/reporting	$849
24-bit	ADAT; MTC; SoDA (SMPTE on digital audio);	No	N/A	N/A	N/N	ASIO 2.0, GigaSampler drivers; optional 8x8 MIDI I/O; includes Cool Edit Pro SE; ADAT optical exp. from 16 to 32 channels	$449–$899
24-bit	MTC	No	N/A	N/A	N/N	2x2 MIDI I/O; ASIO 2.0 and GigaSampler drivers	$329–$789
24-bit	N/A	No	32/unlimited	N/A	N/N	L-Stream modules	$749
24-bit	AES/EBU, word clock, superclock	Yes	N/A	N/A	N/N	XLR audio and MIDI/clock I/O cables included	$549
24-bit	AES/EBU; word clock; superclock; SMPTE; NTSC	Yes	N/A	N/A	N/N	6-foot XLR audio cable; 2-foot sync cable; LS-ADAT; LS-TDIF	$1,095
24-bit	Word clock; super clock; TDIF sync; S/PDIF sync	No	32/256	N/A	Y/Y		$549
24-bit	LTC; VLTC; Sony 9-pin	Yes	32/256	999	N/N	Mixpander PCI card	$6,250
24-bit	Multicard sync	Yes	N/A	N/A	N/N	On-board digital mixing; routing and monitor controls; SCMS, ASIO 1/2; EASI; GSIF, DirectX	$230
24-bit	N/A	No	N/A	N/A	N/N	Hardware monitoring; ASIO 1/2, Mac and Win support	$350
24	Word clock; S/PDIF; internal	Yes	N/A	N/A	N/N	MIDI	$800
24	S/PDIF; internal	Yes	N/A	N/A	N/N	MIDI; 2 built-in mic preamps	$500
24-bit	S/PDIF; internal	Yes	N/A	N/A	N/N	MIDI	$230
24-bit	Multicard sync	No	N/A	N/A	N/N	On-board digital mixing, routing and monitor controls; SCMS, ASIO 1/2; EASI; GSIF; DirectX; Multi card for Mac and Win includes breakout cable; LR sync	$350
24-bit	Multicard sync	No	N/A	N/A	N/N	Split console design; 2 mic pres have inserts; 2 line inputs; 4 stereo aux inputs; effects send; monitor outs; 4 direct outs; stereo record outs; 2 headphone outs	$600
32-, 24-, 16-bit	SMPTE; VITC; MTC; word clock	Yes	Unlimited	Unlimited	Y/Y	Built-in CD mastering tools; automatable surround mixing grid; DSD option	$3,000
24-bit	Video black burst, SMPTE (all, optional)	No	Unlimited	32,767	Y/Y	Can edit and mix CD-ROM master files	$1,600 and up
16-bit	MIDI clock	Yes	N/A	N/A	Y/N	Internal CD-ROM connector	$180

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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
MOTU	24i	(24/2) 1/4" TRS	S/PDIF (RCA and Toslink) out	Win; Mac; ASIO; GSIF	PCI	All native	44.1, 48 kHz	24-bit
MOTU	308	N/A	(8) AES/EBU; 8 S/PDIF (coax)/ (8) S/PDIF (optical)	Win; Mac; ASIO; GSIF	PCI	All native	44.1, 48 kHz	24-bit
MOTU	828	(8/8) 1/4" TRS (2) XLR-1/4" combo	(2/2) S/PDIF (optical) or (8/8) ADAT	Win; Mac	Firewire (IEEE 1394)	All native	44.1, 48 kHz	24-bit
MOTU	896	(8/8) XLR-1/4" combo	(2/2) AES/EBU; (8/8) ADAT	Win ME/2000/XP; Mac OS 9	Firewire (IEEE 1394)	All native	44.1, 48, 88.2, 96 kHz	24-bit
MOTU	1224	(8/10) 1/4" TRS	AES/EBU	Win; Mac	PCI	All native	44.1, 48 kHz	24-bit
MOTU	1296	(12) XLR	AES/EBU	Win; Mac	PCI	All native	44.1, 48, 88.2, 96 kHz	24-bit
MOTU	2408mkII	(8/8) 1/4" TRS	S/PDIF; (3) ADAT Lightpipe; (3) TDIF	Win; Mac	PCI	All native	44.1, 48 kHz	24-bit
Mytek Digital	DAW 9624	(8/8) XLR (expandable)	(4) AES/EBU; ADAT (optional TDIF)	Win 95/NT; Mac BeOS; Linux	PCI	VST; DirectX	44.1, 48, 88.2, 96 kHz	24-bit
RME	Hammerfall 96/36	N/A	(2) ADAT; S/PDIF; AES/EBU	Win 98x/ME/2000/XP; Mac	PCI	VST; Direct X	32, 44.1, 48, 64, 88.2, 96 kHz	24-bit
RME	Hammerfall 96/52	N/A	(3) ADAT; S/PDIF; AES/EBU	Win 98/ME/2000/XP; Mac	PCI	VST; Direct X	32, 44.1, 48, 64, 88.2, 96 kHz	24-bit
RME	Hammerfall Digiface	1/4" TRS stereo line out; headphone out	(3) ADAT; S/PDIF	Win 98/ME/2000/XP; Mac	PCI/PCM CIA	VST; Direct X	32, 44.1, 48, 64, 88.2, 96 kHz	24-bit
RME	Hammerfall Multiface	(8) 1/4" TRS line	ADAT; S/PDIF	Win 98/ME/2000/XP; Mac	PCI/PCM CIA	VST; Direct X	32, 44.1, 48, 64, 88.2, 96 kHz	24-bit
SEK'D	ARC88	(8/8)	Toslink; S/PDIF	Win 95/98/NT; Mac	PCI	N/A	32, 44.1, 48 kHz	16-bit
SEK'D	Prodif 88	(2) balanced out	(8) AES/EBU in/out on XLR	Win 95/98/NT/ 2000/ME	PCI	N/A	44.1, 48, 88.2, 96 kHz	24-bit/96 kHz
SEK'D	Prodif Plus	(1/1) stereo	S/PDIF; AES/EBU; ADAT	Win 95/98/NT; Mac	PCI	N/A	11-96 kHz	20-bit
SEK'D	Prodif T 2496	N/A	(2) TDIF I/O	Win 95/98/ME/NT/ 2000; MME	PCI	N/A	44.1, 48, 96 kHz	N/A
SEK'D	Sequoia	N/A	N/A	Win 95/98/NT/ME	N/A	DirectX	22-192 kHz	N/A
SEK'D	Siena	8	N/A	Win 95/98/NT; Mac	PCI	DirectX	96 kHz	24-bit
Sonorus	STUDI/O	Stereo monitor output	16 via 2x8 ADAT optical interfaces	Win 98/NT/2000; Mac; BeOS; Linux	PCI	N/A	44.1, 48, 88.2, 96 kHz	N/A
Sonorus	USB Studio D	(2) mic; (2) instrument; (2) phono; (4) line in; (2) line out; phone out	(2) S/PDIF I/O	Win; Mac	USB	N/A	44.1, 48 kHz	20-bit/128x
Steinberg	Nuendo 1.5.3	Available 96K I/O	AES/EBU	Win; Mac	N/A	VST; Direct X	Up to 384 kHz	24-bit (depends on soundcard)
Swissonic	USB Studio D USB Studio	(16/4) stereo 1/4" TRS in; (2) mic	S/PDIF	Win; Mac	N/A	N/A	N/A	16-bit
TASCAM	PCI-822	N/A	(8) TDIF; S/PDIF	Win; Mac	PCI	N/A	44.1, 48 kHz	16-, 20-, 24-bit
TASCAM	US-428	(2) XLR; (4) 1/4" out	S/PDIF	Win; Mac	USB	N/A	44.1 kHz	24-bit A/D/A
TerraTec	DMX 6fire	(7/2) 5.1 analog out	(4/4) S/PDIF (coax, optical)	Win 95/98/2000/ NT/XP; Linux	PCI	N/A	32-96 kHz	24-bit
TerraTec	EWS-88D	Stereo out	ADAT; S/PDIF (coax, optical)	Win (all); Linux	PCI	N/A	32-96 kHz	24-bit/96 kHz
TerraTec	EWS-88MT AudioSystem	8/8	(2) S/PDIF	Win	PCI	DirectX	96 kHz	24-bit
TerraTec	EWX-24/96	(2/2) RCA	(2/2) S/PDIF (optical)	Win 95/98/2000/ NT/XP; Linux	PCI	N/A	32-96 kHz	24-bit
TerraTec	MIC 2	(8/8) XLR-1/4" combo	ADAT; S/PDIF; AES/EBU	Mac; Win 98/2000/ NT/XP	PCI; Firewire	N/A	32-96 kHz	24-bit
TerraTec	MIC 8	(8/8) XLR-1/4" combo	ADAT; S/PDIF; AES/EBU	Win 98/2000/ NT/XP; Mac	PCI/Firewire	N/A	32-96 kHz	24-bit
TerraTec	SoundSystem DMX	Stereo line input; (2) stereo outputs	S/PPDIF (coaxial, optical)	Win	PCI	DirectX	32, 44.1, and 48 kHz	8/16-bit

DIGITAL RECORDER RESOLUTIONS (MAX)	SYNC TYPES	MIDI CONTROL	TRACKS/VIRTUAL TRACKS	# OF LOCATE POINTS	EFFECTS/ DYNAMIC PROCESSING	ADDITIONAL FEATURES	PRICE
24-bit	Internal; word clock (in/out); ADAT sync (in)	No	Host dependent	Host dependent	Host dependent	111 dB S/N A-weighted; accepts -10 dB input with software boost; front-panel headphone	$1,195–$1,495
24-bit	Internal; word clock; AES/EBU; S/PDIF; Toslink	No	Host dependent	Host dependent	Host dependent	Standalone format conversion of up to 8 ch at a time	$695
24-bit	ADAT sync (sample-accurate; lightpipe	No	Host dependent	N/A	Host dependent	CueMix Plus no-latency monitoring; 2 mic inputs with mic pre-amps; front panel trims; main out volume knob	$795
24-bit	ADAT, word clock; optical	No	Host dependent	Host dependent	Host-software dependent	Expandable to 72 channels XLR main outs; cuemix notation monitors	$1,295
24-bit	Word clock; ADAT sync; AES/EBU	No	Host dependent	Host dependent	Host dependent	116 dB S/N A-weighted on inputs and XLR main outs; front-panel headphone control	$1,295
24-bit	Internal; word clock; AES/EBU; independent AES word in	No	Host dependent	Host dependent	Y/Y	117 dB S/N A-weighted; supports 5.1 surround I/O; AES/EBU I/O rate converters	$1,795–$2,095
24-bit	Word clock; lightpipe; ADAT; DTP	No	Host dependent	Host dependent	Host dependent	Works as standalone format converter; sample-accurate ADAT/Tascam transfers	$695–$995
32-bit, depending on 3rd party sftwr	Word clock; video; (SMPTE w/extra hardware)	Yes	8 (expandable)/64	N/A	Optional	Various format DIO cards for 8x96	$6,495
24-bit	ADAT	No	18-channel	N/A	N/N	Digicheck software	$575
24-bit	ADAT; word clock	No	26-channel	N/A	N/N	Digicheck software	$699
24-bit	Word clock; ADAT	Yes	26-channel	N/A	N/N	(2) MIDI I/O; Digicheck software; meter bridge	$715
24-bit	Word clock; ADAT	Yes	18-channel	N/A	N/N	MIDI I/O; Digicheck software; meter bridge	$910
24-bit	S/PDIF (dual card)	No	8	N/A	N/N	Input gain amplifier	$499
24-bit	Word clock	No	N/A	N/A	N/N		$799
24-bit	ADAT PLL Lock; AES; S/PDIF	No	10	N/A	N/N	Direct digital input from CD-ROM	$449
24-bit	DTRS	No	N/A	N/A	N/N		$599
32-bit	MTC; MC	Yes	System/999	Unlimited	N/N	EQ; comp; echo; reverb; FFT; convolution; declipping; denoising; stereo enhance; MIDI; CD burning; surround	$2,999
24-bit	MTC; MIDI clock	Yes	Unlimited	Unlimited	N/N	Built-in MIDI data filter driver	$499
24-bit	MTC	No		N/A	N/N		$849
N/A	N/A	No	N/A	N/A	N/N	Stereo input VU meter; phantom powered; insert jacks	$849
32-bit floating	VITC, LTC, word clock, SMPTE, MTC	Yes	Unlimited	Unlimited	Y/Y	Surround sound built in; EDL; unlimited undo with history; VST instruments; import OMF files; import REX files; import Cubase Songs; open TL	$1,299
N/A	N/A	No	N/A	N/A	N/N	19" rack-mount mixer with USB interface for Mac or Windows	$699–$849
N/A	N/A	No	N/A	N/A	N/N		$369
24-bit	N/A	Yes	N/A	N/A	N/N		$625
24-bit	MTC	Yes	N/A	N/A	N/N	Front module; gain knobs; headphone; 5.1 playback	$399
24-bit	MTC	Yes	N/A	N/A	N/N	2 MIDI ports	$349
24-bit	N/A	Yes	N/A	N/A	N/N	Includes internal/external breakout box; fully routable I/O	$599
24-bit	MTC	Yes	N/A	N/A	N/N	Daughter card expansion port	$299
24-bit	LTC; MTC	Yes	N/A	N/A	N/N	32-ch MIDI	$799
24-bit	LTC; MTC	Yes	N/A	N/A	N/N	32-ch MIDI	$1,599
N/A	N/A	Yes	N/A	N/A	Y/N		$199

SEE PAGE 174 FOR A COMPLETE LISTING OF MANUFACTURERS' CONTACT INFORMATION

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
TerraTec	SoundSystem XLerate	Stereo line input; stereo mic input; switchable stereo speaker/line output	N/A	Win	PCI	DirectX	Up to 48 kHz	8/16-bit
TerraTec	SoundSystem XLerate PRO	Stereo line input; (2) stereo outputs	Optical output	Win	PCI	DirectX	32, 44.1, 48 kHz	8/16-bit
Voyetra	Pinnacle Project Studio	[illegible]	S/PDIF (coaxial)	Win 3.1/95/98/NT	ISA	N/A	Up to 48 kHz	20-bit
Voyetra	Montego II Home Studio	1/2	S/PDIF (RCA or optical)	Win 95/98/NT	PCI	N/A	Up to 48 kHz	18-bit
Xytar	Audio Digital Mastering System (ADMS32)	8/8	S/PDIF; AES/EBU; ADAT	Win	PCI	Proprietary, DirectX	11.025–48 kHz	20-bit
YRS MIDI Systems	Digital Audio Workstation	8/8 RCA	2/2 S/PDIF (coaxial)	Win 98	PCI	VST, Direct X	8–96 kHz	A/D 24-bit; D/A 24-bit

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
Behringer	DDX3216	32x16x2	12/16	S/PDIF (coax)	S/PDIF (coax)	2	12/0 1/4" TRS	0/0	24-bit/128x	24-bit/128x
Event Electronics	EZbus	8x4x2	(2) XLR; (16) 1/4" TRS line; (2) 1/4" TRS instr	ADAT optical; S/PDIF (optical, coax)	ADAT; (2) S/PDIF (coax)	N/A	0	(4/4) TRS	24-bit/128x	24-bit
Mackie Designs	Digital 8 Bus	56x8x2	12/24	Up to 34	Up to 34	8 (4 I/O, 4 effects)	12/24/options	12 1/4" TRS snds/ 8 optional rets	24-bit/128x	24-bit/128x
Roland	VM-3100 V Mixing Station	12x8x2	8/10	S/PDIF (optical, coax)	(2) S/PDIF (optical, coax)	N/A	4	4	24-bit	24-bit
Roland	VM-3100 Pro V Mixing Station	20x8x2	2/10	S/PDIF (optical, coax)	(2) S/PDIF (optical, coax)	1	4	4	24-bit	24-bit
Roland	VM-7100/VM-C7100 V Mixing System	38x14x2	11/1	S/PDIF or AES/EBU	(2) S/PDIF; AES/EBU	7	Up to 8	Up to 10	24-bit	24-bit
Roland	VM-7200/VM-C7200 V Mixing System	48x14x2	21/1	S/PDIF or AES/EBU	(2) S/PDIF; AES/EBU	(3) FX; (3) ADAT; TDIF, cascade	Up to 18	Up to 10	24-bit	24-bit
Roland	VM-7200 (x2)/ VM-C7200 (x2) V-Mixing System	94x14/28 flex bus x 2	41/1	(2) S/PDIF or AES/EBU	(4) AES/EBU; S/PDIF	13	24/16	Up to 34	24-bit	24-bit
Soundcraft	328XD	32x8x2	16/16 mono; 5 stereo	(2) ADAT; (2) TDIF; AES/EBU; S/PDIF	(2) ADAT; (2) TDIF; AES/EBU; S/PDIF	N/A	16/0 1/4" TRS	(4/4) 1/4" TRS	24-bit/128x	24-bit/128x
Tascam	DM-24	24x8x2	16/16	(24) TDIF; (8) ADAT; (2) AES/EBU	(24)TDIF; (8) ADAT; (2) AES/EBU	2	16/16 1/4"	(4/4) 1/4" TRS	24-bit	24-bit
Yamaha	01V	24x4	12/4	S/PDIF	S/PDIF	1	0/0 (4 using 1/4" omni outs)	0/0 (4 using 1/4" omni outs)	20-bit	20-bit
Yamaha	02R96	56x8x2	16/8	AES/EBU; (2) S/PDIF	AES/EBU; (2) S/PDIF	4	16/16/ 1/4" TRS	8/0 1/4" TRS	24-bit/96 kHz	24-bit/96 kHz
Yamaha	02Rv2	40x8x2	16/8	(2) AES/EBU or S/PDIF	(2) AES/EBU or S/PDIF	4	8/8/ 1/4" TRS	6/0 1/4" TRS	20-bit/64x	20-bit/8x
Yamaha	03D	16x4x2	8/8	(8) AES/EBU; TDIF; ADAT	(8) AES/EBU; TDIF; ADAT	1	2/0	4/0	20-bit	20-bit

DIGITAL RECORDER RESOLUTIONS (MAX)	SYNC TYPES	MIDI CONTROL	TRACKS / VIRTUAL TRACKS	# OF LOCATE POINTS	EFFECTS / DYNAMIC PROCESSING	ADDITIONAL FEATURES	PRICE
N/A	N/A	Yes	N/A	N/A	N/N		
N/A	N/A	Yes	N/A	N/A	Y/Y		$99
20-bit	SMPTE; MTC	Yes	System dependent	N/A	Y/N	Includes Digital Orchestrator Pro, wavetable sampler, patch editor/librarian software	$460
18-bit	SMPTE; MTC	Yes	System dependent	N/A	Y/Y	Includes Digital Orchestrator Pro; Roland GS-compliant wavetable daughter card	$299
16-bit	SMPTE; MTC	Optional	32/unlimited	Unlimited	Y/Y	Incl 17" monitor, 32-ch mic mixer, CD-R burner, Jaz drive, MP3 encoder/decoder	$7,499
24-bit	All	Yes	128	9	Y/Y	Customized to your specifications	$1,200–$2,400

EQ TYPE	# OF DYNAMIC PROCESSORS	# OF EFFECTS PROCESSORS	AUTOMATION: SCENE / MIDI / DYNAMIC	FREQUENCY RESPONSE	SIGNAL-TO-NOISE RATIO	TOTAL HARMONIC DISTORTION	CHANNEL CROSSTALK (@ 1 KHZ)	PHANTOM POWER	SPECIAL FEATURES	DIMENSIONS (INCHES)	PRICE
4-band paramatric	2	4	Y/Y/Y	20 Hz-20 kHz	95 dB	.05%	N/A	Ch. 1-6; ch. 7-12	100mm ALPS; SMPTE; MTC; RS232 connector; PC card slot; free Windows software	17.25x22.5x6.5	$1,999
3-band, low/high shelving with parametric mid band	8	0	Y/Y/Y	20 Hz-20 kHz	A/D/A >101 dB; A/D 110 dB	N/A	<120 dB (below noise floor)	Yes	Functions as control surface for DAWs, virtual instruments and MIDI-capable devices; 32 onboard provides 8 ch. of 24-bit/48k audio or 4 ch. of 24-bit/96k audio via ADAT optical ($199)	17.13 x 9.5 x 3	$8
4-band parametric	48	Up to 16 optional	Y/Y/Y	20 Hz-20 kHz	106 dB @ 1 kHz	0.005%	-90 dBu	12 chans	VFX and MFX cards, optical cards	37.6x27.1x8.7	$10,999
3-band	2	2	Y/Y/N	N/A	N/A	N/A	N/A	Yes	Dedicated Hi-Z guitar input	13.5x3.75x12	$995
3-band	2	2	Y/Y/N	N/A	N/A	N/A	N/A	Yes	Dedicated Hi-Z guitar input; microphone modeling; speaker modeling	13.5x3.75x13.5	$1,295
6-band	48	2 (up to 8)	Y/Y/Y	N/A	N/A	N/A	N/A	Yes	Modular; moving faders; 5.1 mixing; RTA; speaker modeling	17x5.25x16.5 (7100); 17x2.6x17 (C7100)	$1,995/$2,995
6-band	48	2 (up to 8)	Y/Y/Y	N/A	N/A	N/A	N/A	Yes	Modular; moving faders; 5.1 mixing; RTA; speaker modeling	17x5.25x16.2 (7200); 29.5x2.75x17(C7200)	$2,795– $3,695
5-band	94	4 (up to 16)	Y/Y/Y	N/A	N/A	N/A	N/A	Yes	Modular; moving faders; 5.1 mixing; RTA; speaker modelingADAT/Tascam interfaces	17x5.25x16.2 (7200); 29.5x2.75x17(C7200)	$3,695–$6,590
3-band parametric	On all inputs, groups and main mix	2 (Lexicon)	Y/Y/Y	20 Hz-20 kHz	N/A	0.005%	>95 dB	Global	"E-strip" for analog console feel; 6 auxes per channel; 100mm faders; Undo/Redo; Copy; Paste	28.2x21.1x6.3	$5,000
4-band paramentric	2 ea ch	2 ea ch	Y/Y/Y	N/A	N/A	N/A	N/A	Yes	24-bit/96 kHz performance; latency compensation		$2,999
4-band parametric	22	2	Y/Y/N	20 Hz–20 kHz	98 dB	<0.1%	-70 dB	+48V		20.4x5.8x16.9	$1,999
4-band parametric	56	4	Y/Y/Y	20 Hz-40 kHz (96 kHz)	N/A	>0.01%	N/A	Per channel	I/O cards: ADAT, TDIF, AES/EBU, analog in, analog out, Apogee I/O, Waves effects card; MB02R96 meter bridge	26.25x27.5x9.5	$11,397
4-band parametric	48	2	Y/Y/Y	20 Hz-20 kHz	N/A	>0.02%	-70 dB	Per channel	I/O cards: ADAT, TDIF, AES/EBU, analog in, analog out, Apogee I/O; MB02 meter bridge	26x27x8.11	$8,899
4-band parametric	40	2	Y/Y/N	20 Hz–20 kHz	98 dB	>0.1%	-70 dB	+48V	Total param recall; dyn/efx libraries	20.3x8x18.1	$3,699

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DIGITAL AUDIO CONVERTERS

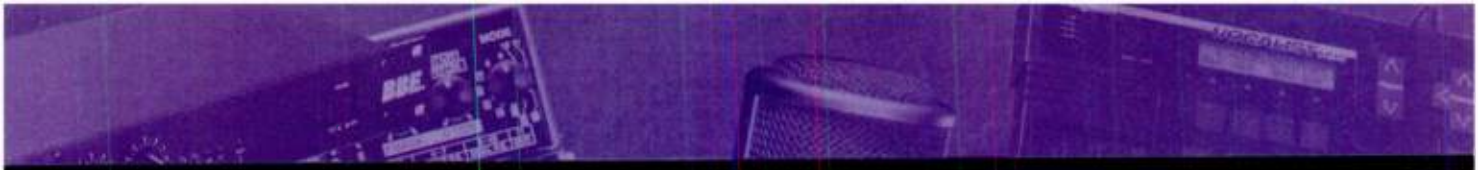
MANUFACTURER	PRODUCT	CONVERTER TYPE/#	ADC RESOLUTION, OVER SAMPLING	DAC RESOLUTION	SAMPLE RATE(S)	SAMPLE RATE CONVERSION	DITHER	ANALOG I/O #/TYPE
Alesis	[illegible]3	A/D (8); D/A (8)	24-bit/128x	24-bit/128x	48 kHz	No	No	(8) 1/4" TRS
Alesis	A[illegible]4	Format converter (8)	N/A	N/A	44.1, 48, 88.2, 96 kHz	No	No	N/A
Apogee Electronics	8-ch Converter Cards for Yamaha Systems	Various	24-bit Delta-Sigma	24-bit	44.1, 48, 88.2, 96 kHz	No	No	Various
Apogee Electronics	AD-16	A/D (16)	24-bit/OE	N/A	44.1-96 kHz	No	UV22HR	DB 25
Apogee Electronics	AD8000/AD8000 SE	A/D (8)	24-bit/SE	N/A	44.1, 48 kHz	No	UV22HR	(8) XLR
Apogee Electronics	DA-16	D/A (16)	N/A	24-bit/OE	44.1-96 kHz	No	No	DB-25
Apogee Electronics	Mini-Me	A/D (2)	24-bit/OE	N/A	44.1-96 kHz	Yes	UV22HR	(2) 1/4" TRS–XLR
Apogee Electronics	PSX-100/SE	A/D (2); D/A	24-bit Delta-Sigma	24-bit Delta-Sigma	44.1, 48, 88.2, 96 kHz	No	UV 22HR	XLR
Apogee Electronics	Rosetta 48K/96K	A/D (2)	24-bit Delta-Sigma	N/A	44.1, 48 kHz (Rosetta 48); 44.1, 48, 88.2, 96 kHz (Rosetta 96)	No	UV 22HR	XLR
Apogee Electronics	Trak2	2-channel mic pre w/24/96 A/D, 8-ch routing and dig I/O	24-bit Delta-Sigma	24-bit (optional)	44.1, 48, 88.2, 96 kHz	No	UV 22HR	XLR
A.R.T.	ART DIO	AD/DA	24-bit/128x	96 kHz	44.1, 48, 88.2, 96 kHz/128x oversampling	No	No	1/4"
Benchmark	ADA 2008	A/D; D/A	20-bit/64x	20-bit	44.1, 48 kHz; varispeed (28-54 kHz)	No	No	XLR
Benchmark	AD2402-96	A/D (2)	24-bit/128x		44.1, 48, 88.2, 96 kHz	Yes	Yes	(2) XLR
Benchmark	AD2404-96	A/D (4)	24-bit/128x	N/A	44.1, 48, 88.2, 96 kHz, varispeed	No	Yes	(4) XLR
Benchmark	AD2408-96	A/D	24-bit/128x	N/A	44.1, 48, 88.2, 96 kHz, varispeed	No	Yes	(8) XLR
Benchmark	DAC-1	D/A (2)	N/A	24-bit/128x	28-96 kHz	No	No	(2) XLR; (2) RCA
Behringer	Ultramatch SRC2000	Digital formant converter	N/A	N/A	N/A	Yes	No	N/A
Crane Song	HEDD-192	A/D; D/A	24-bit	24-bit	44.1, 48 kHz	No	No	XLR
dB Technologies	MAD•824	A/D	24-bit/128X	N/A	40–100 kHz	Yes	Yes	XLR
dB Technologies	MDA•824	D/A	N/A	24-bit/64X	40–100 kHz	Yes	Yes	XLR
Denecke	AD-20	A/D	20-bit/128x	N/A	44.1 kHz	No	Yes	XLR in; RCA line in (optional)
Digidesign	96 I/O	A/D (8); D/A (8)	24-bit	24-bit	44.1, 48, 88.2, 96 kHz	Yes	Yes	(8) 1/4" TRS
Digidesign	192 I/O	A/D (16); D/A (16)	24-bit	24-bit	44.1, 48, 88.2, 96, 172.4, 192 kHz	Yes	Yes	(16) D-Sub
Digidesign	882I20 I/O	A/D (8); D/A (8)	20-bit	20-bit	44.1, 48 kHz	Yes	Yes	(8) 1/4" TRS
Digidesign	882I24 I/O	A/D (8); D/A (8)	24-bit	24-bit	44.1, 48 kHz	Yes	Yes	(8) XLR
Digidesign	1622 I/O	A/D (16); D/A (2)	20-bit	24-bit	44.1, 48 kHz	Yes	Yes	(16) 1/4" TRS
Fostex	AC 2496	A/D (8) (16-ch optional)	24-bit/128x	N/A	44.1-96 kHz	No	No	(8) 1/4" TRS (+4/-10)
Fostex	COP-1/96k	A/D; D/A	N/A	N/A	32-96 kHz	No	No	N/A
Fostex	VC-8	ADAT optical to analog (8)	20-bit	20-bit	32, 44.1, 48 kHz	No	No	(8) 1/4"
Frontier Design	Tango24	A/D (8); D/A (8)	24-bit/128x	24-bit/128x	44.1, 48 kHz; 39-51 kHz from external clock	No	No	(8) 1/4" TRS
Genex	GXA8 ADC	A/D (8)	24-bit	24-bit	192 kHz	No	Yes	(8) 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	0.0025%	96 dB	Signal/clip meters; optical out source switch	$499
(4) AES/EBU; (2) ADAT	Yes	No	No	N/A	144 dB	Independant clocking on AES/EBU to ADAT and ADAT to AES/EBU	$499
Various	No	No	Yes	-105 dB (A/D), -103 dB (A/D)	117 dB A-weighted (A/D); 116 dB A-weighted (D/A)	8 ch converters; same cards fit both YGDAI (02R) and Mini-Y (01V) slots; AP8AD card features soft limit	$1,495 (AP8AD) $1,195 (AP8DA)
ADAT/S-MMX; AES/EBU option; TDIF option	Yes	No	Yes	THD+N = -105 dB	>117 dB	Soft limit	$2,995
(4) XLR	Yes	Yes (optional)	Yes	THD+N = -110 dB	>114 dB	Card-based digital I/O; optional 8-ch and 2-ch D/A cards	$4,995/6,995
AES/EBU; TDIF; ADAT/S-MMX	Yes	Optional	Yes	THD+N = -104 dB	>116 dB	Soft limit	$2,995
AES/EBU; S/PDIF; USB	No	No	Yes	THD+N = -93 dB	>105 dB	Mic/line/instrument pre; phantom power; soft limit and 3-curve comp/lim; monitor output incl return from USB; low voltage/current operation for battery power	$1,395
AES/EBU, S/PDIF; ADAT, TDIF	Yes	Optional	Yes	-112 dB (-0.1 dBFS A-weighted)	> 119 dB (-60 dB A-weighted)	3 modes enable cross-connection of A/D & D/A; format conversion; ABS/ABS96 bit-splitting; low jitter clock	$2,995-$3,995
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 to add 88.2/96 kHz; pro/consumer analog in	$1,295-$1,995
2-ch AES/EBU; S/PDIF; other interfaces on plug-in cards	Yes	Optional	Yes	-112 dB A-weighted (A/D)	> 119 dB -60 dB A-weighted (A/D)	2-ch mic pre; phantom power; line mic and instrument level inputs; format conversion; AMBus digital I/O cards; low jitter clock	$3,995
S/PDIF (coax)	No	No	No	0.01% (clean settings); 0.1% (warm settings)	100 dB typical	Vacuum tube	$199
AES/EBU; ALR; BNC	No	No	Yes	0.0004% @ -1 dB FSD (20 Hz-20 kHz)	110 dB (20 Hz-20 kHz)	128 dBFS (0.00004%) @ -1 dBFSDCCIF IM	$4,285
(2) AES/EBU; S/PDIF (coax: 2 in, 1 out)	No	No	Yes	THD+N= -107 dB (0.00033%)	117 dB	11 word length reduction types; 38 noise-shaping curves; simultaneous 16- and 24-bit output; digital-to-digital processing	$1,795
(2) AES/EBU; (3) XLR; S/PDIF	No	No	Yes	0.00003% @ 1dB FSD (20 Hz-20 kHz)	117 dB (20 Hz-20 kHz)	Jitter reducing phase-locked-loop circuitry; (4) 9-segment digital monitors	$2,850
(4) AES/EBU; XLR; AES2id; BNC; S/PDIF	No	No	Yes	0.00003% @ 1 dB FSD (20 Hz-20 kHz)	117 dB (20 Hz-20 kHz)	Jitter reducing phase-locked-loop circuitry; (4) 9-segment digital monitors	$5,095
AES/EBU, S/PDIF (coax, optical)	No	No	Yes	THD+N= -104 dB (0.00067%)	117 dB	Ultralock low-jitter technology; headphone amp; direct connection to powered monitors	$795
AES/EBU; S/PDIF	Yes	No	No	0.001%	95 dBFS	SCMS copy-bit and emphasis-bit removal	$169
AES/EBU, S/PDIF	Yes	No	Yes	Depends on process	>117 dB	DSP generates tricode/pentode tube sound in the digital domain	$3,495
AES/EBU	Yes	No	Yes	0.001% unweighted	113 dB unweighted	Analog soft saturation and digital tape saturation; word length control—24, 20 or 16 bits; settings stored in non-volatile RAM; 112 dB channel separation	$1,495 and up
AES/EBU	Yes	No	Yes	0.0014% unweighted	112 dB unweighted	Jitter removal; DSP based up-sampling; 96 kHz capable; 112 dB channel separation	$1,345 and up
S/PDIF (optical, coax) out	No	No	Yes	0.0016%	> 99 dB	Built-in mic preamp	$325
(8) ADAT optical; AES/EBU, S/PDIF	Yes	No	Yes	A/D: <0.0007%; D/A: <0.0013%	A/D: 115 dB (A-weighted)/ 112 dB (unweighted); D/A: 114 dB (A-weighted)/ 112 dB (unweighted)	Expansion and Legacy Peripheral Ports	$1,995
(8) AES/EBU; (8) TDIF; (16) ADAT; (2) add'l AES/EBU or S/PDIF	Yes	No	Yes	A/D: <0.00035%; D/A: <0.00056%	A/D: 120 dB (A-weighted)/ 118 dB (unweighted); D/A: 118 dB (A-weighted)/ 115 dB (unweighted)	192 DIGITAL I/O - all digital version; Expansion and Legacy Peripheral ports; expansion bay; soft-clip limiter	$3,995
(2) S/PDIF; RCA	No	No	Yes	A/D: <0.003%; D/A: <0.003%	A/D: 103 dB (A-weighted)/) 100 dB (unweighted); D/A: 98 dB (A-weighted)/ 96 dB (unweighted	For use with Pro Tools 24 Mix and Pro Tools HD systems	$1,245
(8) AES/EBU; (2) S/PDIF (coax)	No	No	Yes	A/D: <0.003%; D/A: <0.003%	A/D: 110 dB (A-weighted)/ 107 dB (unweighted) D/A: 105 dB (A-weighted)/ 103 dB (unweighted)	For use with Pro Tools 24 Mix and Pro Tools HD systems; can be used in stand-alone mode	$3,695
(2) 24-bit S/PDIF	No	No	Yes	A/D: <0.004%; D/A: <0.003%	A/D: 99 dB (A-weighted), D/A: 105 dB (A-weighted)	For use with Pro Tools 24 Mix & Pro Tools HD systems	$1,595
N/A	Yes	Yes	Yes	<0.004%	>110 dB	Optional AES/EBU card; optional 8-ch card for 16 ch	$899
S/PDIF (optical, cover)	No	No	No	N/A	N/A	96 kHz compatible	$94
ADAT, S/PDIF	Yes	No	No	N/A	N/A	Selectable clock; adds analog I/Os to digital recorders, or 8 analog ins to PCs	$339
(8) ADAT optical in/out/thru	Yes	No	Yes	0.002% A-weighted	105 dB A-weighted	+4 dBu or -10 dBV, selectable per channel	$699
(8) AES/EBU	Yes	No	No	N/A	123 dB	DSD support, bit-splitting; support for ADAT, TDIF, S/PDIF2	$3,649

SEE PAGE 174 FOR A COMPLETE LISTING OF MANUFACTURERS' CONTACT INFORMATION

DIGITAL AUDIO CONVERTERS

MANUFACTURER	PRODUCT	CONVERTER TYPE/#	ADC RESOLUTION, OVER SAMPLING	DAC RESOLUTION	SAMPLE RATE(S)	SAMPLE RATE CONVERSION	DITHER	ANALOG I/O #/TYPE
Genex	GXD8 DAC	D/A (8)	24	24-bit	192 kHz	No	Yes	(8) XLR
iZ Technology Corp.	UFC-24	Digital format converter		N/A	32–48 kHz	No	No	N/A
Lucid	AD9624	A/D (2)	24-bit/128x	N/A	96, 88.2, 48, 44.1, 32 kHz	Yes	Yes	(2) XLR
Lucid	ADA1000	A/D; D/A	20-bit/64x	20-bit/64x	32, 44.1, 48 kHz	No	No	(4) XLR; (4) 1/4" TRS
Lucid	ADA8824 (ADAT)	A/D/A (8 ch)	24-bit/128x	24-bit/128x	44.1, 48 kHz	Yes	No	(8) XLR
Lucid	DA9624	D/A (2)	N/A	24-bit/128x	96, 88.2, 48, 44.1, 32 kHz	Yes	No	(2) 1/4" TRS, XLR
Lucid	SRC9624	Sample rate converter	N/A	N/A	32-100 kHz	Yes	Yes	N/A
Mackie	8.Mix	Analog to TDIF converter	20-bit AKM	20-bit AKM	44.1, 48 kHz	No	No	(8) RCA
Mackie Designs	I/O896	A/D (8); D/A (8)	24-bit/128x	24-bit/128x	44, 48, 88.2, 96 kHz	Yes	Yes	Sub D-25
M-Audio	CO3	Formal converter: S/PDIF; Toslink; AES/EBU	N/A	N/A	All	Yes	No	N/A
M-Audio	SuperDAC 24/96	D/A	N/A	24-bit/128x	22-100 kHz	No	No	(2) 1/4" TRS; (2) XLR
Merging Technologies	Sphynx Modular High Resolution Audio Interface	N/A	24-bit	24-bit	32, 44.1, 48, 64, 88, 96 kHz	Yes	Yes	(8) 1/4"
Midiman	Flying Cow 24-bit	A/D (2); D/A (2)	24-bit/128x	24-bit/128x	32, 44.1, 48 kHz	No	No	(2) 1/4"
Mytek Digital	8x96 Series	A/D; D/A	24-bit/64x/128x	24-bit	44.1, 48, 88.2, 96 kHz	No	Yes	(8) XLR
Mytek Digital	Workstation 24	N/A	24-bit/64x	24-bit	44.1, 48 kHz	No	Yes	XLR
Otari	FS-96	Format/sample rate converter	24-bit	24-bit	32, 44.1, 48, 88.2, 96 kHz	Yes	Yes	N/A
Otari	UFC-24	Format converter	24-bit	24-bit	44.1, 48 kHz	No	No	N/A
Panasonic	WZ A/D 96M	A/D	24-bit/128 X	24-bit	44.1, 48, 88.2, 96 kHz	No	Yes	8 XLR
Panasonic	WZ A/D 96/WZ D/A 96	A/D	24-bit/128x	24-bit	44.1, 48, 88.2, 96 kHz	No	Yes	(8) XLR
Precision	SRD-1	N/A	N/A	N/A	N/A	No	No	N/A
Radio Design Labs	RU-AEC1	N/A	24-bit	N/A	32, 44.1, 48, 88.2, 96 kHz	No	No	XLR
RME	ADI-8 DD	D/D (16)	N/A	24-bit/128x	44.1, 48, 88.2, 96 kHz	Yes	Yes	N/A
RME	ADI-8 DS	A/D (8); D/A (8)	24-bit/128x	24-bit/128x	44.1, 48, 88.2, 96 kHz	Yes	Yes	(8) 1/4" TRS; 25-pin
RME	ADI-8 Pro	A/D (8); D/A (8)	24-bit/128x	24-bit/128x	44.1, 48 kHz	Yes	No	(8) 1/4" TRS, 25-pin D type
RME	ADI-96 Pro	A/D (2)	24-bit/128x	N/A	32, 44.1, 48, 64, 88.2, 96 kHz	Yes	Yes	(2) XLR mic
SEK'D	2496 S	A/D; D/A	24-bit/128x	24-bit/128x	44.1, 48, 96 kHz	No	No	(2) XLR
Sonifex	RedBox	A/D; D/A	N/A	24-bit	32, 44.1, 48, 64, 88.2, 96 kHz	No	No	XLR; RCA
Sonifex	Sample Rate Converter RB-SC1	A/D; D/A	N/A	N/A	32, 44.1, 48, 64, 88.2, 96 kHz	Yes	No	N/A
Sonorus	AUDI/O AD/8	N/A	24 bits or dithered to 16 or 20 bits	N/A	44.1, 48, 88.2, 96 kHz	No	Yes	(8) XLR-1/4" combo
Sonorus	AUDI/O AD/24	N/A	24-bit/128x	N/A	44.1, 48 kHz	No	No	(8) XLR
Sonorus	AUDI/O AD/96	N/A	16, 18, 20, 24-bit	N/A	44.1, 48, 88.2, 96 kHz internal; 42-50, 84-100 kHz external	No	Yes	(4) XLR
Sonorus	AUDI/O DA/24	N/A	N/A	24-bit/128x	44.1, 48 kHz	No	No	(8) XLR
Sonorus	AUDI/O DA/96	N/A	N/A	24-bit	44.1, 48, 88.2, 96 kHz internal; 42-50, 84-100 kHz external	No	Yes	(4) XLR
Swissonic	AD8/AD8 Pro	A/D (8)	24-bit	N/A	44.1, 48, 88.2, 96 kHz	No	Yes	XLR-1/4" combo
Swissonic	AD24 Mk II	N/A	24-bit/64x	N/A	44.1, 48 kHz	No	No	CMR; XLR in
Swissonic	AD96 Mk II	N/A	16,18, 20, 24-bit	N/A	44.1, 48, 88.2, 96 kHz	No	Yes	(4) CMR
Swissonic	DA24 Mk II	N/A	N/A	24, 16-bit	44.1, 48 kHz	No	No	(8) XLR
Swissonic	DA96 Mk II	N/A	N/A	24-bit	N/A	Yes	Yes	(4) XLR
Z-Systems	Digital Sample Rate Converters	N/A	N/A	N/A	N/A	Yes	No	N/A



DIGITAL I/O #/TYPE	WORD CLOCK I/O	VIDEO INPUT SYNC	RF FILTERING	THD	DYNAMIC RANGE	SPECIAL FEATURES	PRICE
(8) AES/EBU	Yes	No	No	N/A	120 dB	DSD support; bit-splitting; support for ADAT, TDIF, S/PDIF2	$3,049
(24) AES/EBU; TDIF; ADAT; S/PDIF-2	Yes	No	No	N/A	>117 dB	Configuration presets recalled via MIDI; formats output simultaneously	$1,495
(2) AES/EBU; (1) S/PDIF (coax); Toslink	Yes	No	Yes	<0.002%	>115 dB	User-selectable 16-bit noise shaping; 20-seg input level LED ladders w/peak, hold, clip indicator	$899
(2) AES/EBU or (2) S/PDIF	No	No	Yes	0.005%	>95 dB		$499
(4) AES/EBU; (1) S/PDIF; (2) ADAT sync	Yes	No	Yes	<0.005%	>113 dB A/D; >105 dB D/A	ADAT-optical (light pipe) I/O; ADAT sync I/O connectors	$2,499
(2) AES/EBU; (1) S/PDIF (coax), Toslink	No	No	Yes	<0.002%	>114 dB	Separate headphone vol control; front panel out; 20-seg output level LED ladders	$749
(2) XLR; AES/EBU; (2) S/PDIF coaxial; (2) Toslink	Yes	Yes	No	-117 dB max	120 dB min, 128 dB typical	Single & double wire 96 kHz I/O; 5 internal and 3 external master clock options	$1,499
TDIF	Yes	No	No	< -94 dB	100 dB (A-weighted)	8 ch LED input level metering at -30 dBFS and -3 dBFS	$399
AES/EBU; ADAT; MADI	Yes	Yes	Yes	THD+N < -116 dB @ -0.5 dBfs	-116 dB, A-weighted	Optional MADI card bay, optional Firewire host I/O card bay	$3,995
S/PDIF, Toslink; AES/EBU	No	No	No	N/A	N/A	SCMS bit management	$250
AES/EBU; S/PDIF (coax, optical); Toslink	No	No	Yes	<0.0015%	115.5 dB		$300
up to 8 AES/EBU; ADAT; S/PDIF	Yes	Yes	Yes	THD+N -101dB	117 dB (A-weighted)	Extended modularity with up to 8 ch of 24-bit/96 kHz I/O	$2,995 and up
(2) AES/EBU; (2) S/PDIF	No	No	No	0.003%	103 dB		$400
(4) AES/EBU; (2) ADAT; ProTools; Sonic; TDIF	Yes	No	Yes	-106 dB	120 dB	S/MUX and MRX bit-splitting; digital format conversion; 96 kHz	$2,795
S/PDIF; AES/EBU; Toslink	Yes	No	Yes	-103 dB THD	117 dB	Digital format conversion; signal routing	$1,995
(24) ADAT; (24) TDIF; (24) S/PDIF; (24) AES/EBU	Yes	No	No	N/A	N/A	MADI option: TDIF to/from AES/EBU ($995)	$3,495
(24) ADAT; (24) TDIF; (24) S/PDIF; (24) PD	Yes	No	No	N/A	N/A		$995
AES/EBU; ADAT, TDIF optional	Yes	No	Yes	0.003	117 dB	Supports all current and proposed digital output; mic preamp w/ A/D converter	$2,496
AES/EBU; Toslink	Yes	No	Yes	0.003	118 dB	Precision metering with selectable reference levels	$2,195
N/A	Yes	No	No	N/A	N/A		$150
N/A	No	No	Yes	< 0.04%	> 90 dB	Sure-Lok auto recovery system	$443
(4) XLR; AES/EBU; ADAT optical; TDIF	Yes	No	Yes	0.00014%	-128 dB		$1,215
ADAT; TDIF	Yes	No	Yes	0.00063%	116 dB		$2,255
ADAT; TDIF	Yes	No	Yes	0.008%	-116 dB	Many DSP functions	$1,750
S/PDIF; AES/EBU; (2) XLR link; (2) 1/4" TRS	Yes	No	Yes	0.001%, -100 dB	117 dB	Many DSP functions	$1,750
(2) AES/EBU; S/PDIF (coax)	No	No	No	0.002%	>115 dB	Half-rack space	$799
AES/EBU; S/PDIF	Yes	No	No	96 dB THD + N at 1 kH	110 dB		$715
AES/EBU; S/PDIF	No	No	No	-114 dB THD + N at 1 kHz	120 dB		$530
(2) Toslink; (4) AES/EBU (Pro version)	Yes	No	Yes	0.007% at min gain	115 dB at min gain	Neutrik XLR/1/4" combo-inputs; phantom power, 40 dB gain	$1,499
ADAT; Toslink	Yes	No	Yes	99 dB THD +N	115 dB SNR (A-weighted)	Half-rack space	$749
AES/EBU; S/MUX, ADAT	Yes	No	Yes	100 dB	115 dB (A-weighted)	Half-rack space; high-res; multi-mode meters; bit-word-packing	$999
ADAT; Toslink	Yes	No	Yes	97 dB THD +N	106 dB (A-weighted)	Half-rack space	$599
AES/EBU; S/MUX; Toslink	Yes	No	Yes	96 dB	110 dB (A-weighted)	Half-rack space; supports bit- and sample-packing	$999
(2) Toslink or (4) AES/EBU	Yes	No	No	< 0.007%	115 dB	Internal/external sync, gain pots; 19" rackmount; 8 mic preamps w/ phantom	$2,098–$2,598
Toslink	Yes	No	No	0.001% (-1 dBFS input level)	115 dB (A-weighted) 113 dB (unweighted)	Half-rack space	$899
(2) XLR	Yes	No	No	0.003% (@ -1 dBFS)	115 dB (A-weighted)	For bit-packed/sample-packed ADAT formats	$1,349
Toslink	Yes	No	No	< -97dB	115dB	Half-rack space	$699
AES/EBU: professional or consumer (jumper selectable) XLR; Toslink	Yes	No	No	0.003%(@ -1 dBFS)	110 dB (A-weighted)	Support for bit-packed/sample-packed ADAT formats enables recording of 24/96 data on conventional 16/48 MDM's; half-rack design	$1,149
AES/EBU; S/PDIF; Toslink	Yes	No	No	N/A	N/A	Formal conversion	$450 and up

SEE PAGE 174 FOR A COMPLETE LISTING OF MANUFACTURERS' CONTACT INFORMATION

DIGITAL MIXDOWN MACHINES

MANUFACTURER	MODEL	TYPE	SAMPLING FREQUENCY	PLAYBACK FREQUENCY	ADC	DAC	ANALOG I/O	DIGITAL I/O	TIME CODE	SCMS	SEPARATE MIC INPUT
Alesis	MasterLink ML-9600	Hard disk; CD-R	44.1, 48, 88.2, 96 kHz	44.1, 48, 88.2, 96 kHz	24-bit	24-bit	XLR; RCA	AES/EBU; S/PDIF (coax)	No	No	No
Denon	DN-FZOR	CF I.C. recorder	24, 48 kHz	24, 48 kHz	1-bit, 64fs digital filter	1-bit, 8fs digital filter	RCA	N/A	No	No	Yes
Denon	DN-M991R	MiniDisc	44.1 kHz	44.1 kHz	16-bit	18-bit	XLR	XLR	No	Yes	No
Denon	DN-M991RM	MiniDisc	44.1 kHz	44.1 kHz	16-bit	18-bit	XLR	XLR	No	Yes	No
Denon	DN-M1050R	MiniDisc	32, 44.1, 48 kHz	44.1 kHz	16-bit	18-bit	XLR; RCA	AES/EBU; S/PDIF (coax)	Optional	Yes	No
Denon	DN-M2300R	MiniDisc	44.1 kHz	44.1 kHz	16-bit	18-bit	RCA	S/PDIF (coax)	No	Yes	No
Fostex	D5	DAT	32, 44.1, 48 kHz	44.1, 48 kHz	1-bit	1-bit	XLR	AES/EBU; S/PDIF (optical, coax)	No	No	No
Fostex	D15	DAT	44.1, 48 kHz	44.1, 48 kHz	18-bit	18-bit	XLR	AES/EBU	Optional	No	No
HHB	MDP500	Portable	44.1 kHz	44.1 kHz	N/A	N/A	XLR; RCA	S/PDIF (coax, optical)	No	Yes	Yes
Marantz	PMD650	Portable	44.1 kHz	44.1 kHz	N/A	N/A	XLR; 1/4"; RCA	AES/EBU; S/PDIF (coax)	No	No	Yes
Sony	MDS-E10	MiniDisc	44.1 kHz	44.1 kHz	24-bit	20-bit	RCA	S/PDIF (optical)	No	No	No
Sony	MDS-E12	MiniDisc	44.1 kHz	44.1 kHz	24-bit	20-bit	RCA	S/PDIF (optical)	No	No	No
Sony	MDS-JE630	MiniDisc	44.1 kHz	Auto	24-bit	20-bit	RCA	S/PDIF (optical)	No	Yes	No
Sony	MZR	Portable MiniDisc	44.1 kHz	Auto	16-bit	16-bit	1/8" mini stereo	S/PDIF (optical)	No	Yes	Yes
Sony	PCM-M1	DAT	32, 44.1, 48 kHz	Auto	16-bit	16-bit	1/8" stereo mini	7-pin w/opt. cable	No	No	Yes
Sony	PCM-R300	DAT	32, 44.1, 48 kHz	Auto	20-bit	16-bit	RCA	S/PDIF	No	No	No
Sony	PCM-R500	DAT	32, 44.1, 48 kHz	Auto	20-bit	16-bit	XLR; RCA	AES/EBU, S/PDIF (coax)	No	No	No
Sony	TCD-D8	DAT	32, 44.1, 48 kHz	Auto	16-bit	16-bit	1/8" stereo mini	7-pin connector w/opt. cable	No	Yes	Yes
Tascam	DA-20 MkII	DAT	32, 44.1, 48 kHz	32, 44.1, 48 kHz	1-bit Delta/ Sigma	1-bit Delta/ Sigma	RCA	S/PDIF (optical)	No	No	No
Tascam	DA-40	DAT	32, 44.1, 48 kHz	32, 44.1, 48 kHz	20-bit	20-bit	XLR; RCA	AES/EBU; S/PDIF	No	Yes	No
Tascam	DA-45HR	DAT	32, 44.1, 48 kHz	32, 44.1, 48 kHz	24-bit	24-bit	XLR; RCA	AES/EBU; S/PDIF	No	Yes	No
Tascam	DA-60 MkII Time Code DAT	DAT	44.1, 48 kHz	44.1, 48 kHz	16-bit linear	16-bit linear	XLR; RCA	AES/EBU; S/PDIF	Yes	Yes	No
Tascam	DA-302 Dual	DAT	32, 44.1, 48 kHz	32, 44.1, 48 kHz	16-bit	16-bit	RCA	S/PDIF	No	Yes	No
Tascam	MD-301 MkII	MiniDisc	32, 44.1, 48 kHz	32, 44.1, 48 kHz	20-bit	20-bit	XLR; RCA	Optical	No	No	No
Tascam	MD-350	Mini disc	44.1 kHz	44.1 kHz	16-bit, linear	16-bit, linear	XLR, RCA	S/PDIF (optical)	No	Yes	No
Tascam	MD-801R MkII	MiniDisc	32, 44.1, 48 kHz	32, 44.1, 48 kHz	20-bit	20-bit	XLR; RCA	AES/EBU; S/PDIF	No	No	No
Yamaha	MD8	MiniDisc	44.1 kHz	44.1 kHz	N/A	N/A	N/A	N/A	Yes	No	Yes

WRITE/READ SPEED	SCSI CONNECTION	TRANSPORT DISC LOADING	BUNDLED SOFTWARE	DISC-AT-ONCE	FREQUENCY RESPONSE	SIGNAL-TO-NOISE RATIO	TOTAL HARMONIC DISTORTION	SPECIAL FEATURES	PRICE
4x/8x	No	Front-loading CD-R drive	No	Yes	20 Hz–20 kHz	113 dB	<0.002%	Playlists; editing; CD24; audio CD	$1,699
1x	No	No	No	No	20 Hz-20 kHz	>/= 80 dB	0.005%	Linear, MPEG1, MPEG2 formats; mic limiter, low filter and atten; (2) slots for extended recording; onboard editing, approx 2 lbs.	$1,299
1 x	No	Manual	Optional	No	20 Hz-20 kHz	>100 dB	0.02%	Hot start; shock memory; undo/redo; RS232/422; DN-M991RM; GPI interface	$2,299
1 x	No	Manual	Optional	No	20 Hz-20 kHz	>100 dB	0.02%	Same as DN-M991R but with five enhanced features	$2,499
1 x	No	No	No	No	20 Hz–20 kHz	>92 dB	0.012%	Extrnl sync option; hot-start option; RS232/422; PC kybrd cntrl; GPI interface	$1,999
1 x	No	Manual	No	No	20 Hz–20 kHz	>92 dB	<0.012%	Keyboard connector; dual drives; disc copy; hot start; shock memory; disc titling	$1,499
N/A	No	Tray	No	No	20 Hz–20 kHz	92 dB	N/A	Supplied infrared remote headphone matrix options	$999
N/A	No	Drawer	No	No	20 Hz–20 kHz	92 dB	0.05%	Parallel port; time code w/video ref; RS422 rack optional	$3,295
1 x	No	No	No	No	10 Hz–20 kHz	>89 dB	<0.02%	USB; transportable; onboard editing	$1,545
N/A	No	Top load	No	No	20 Hz–20 kHz	85 dB	N/A	Sampling freq converter; phantom power; audio buffer; dual mono rec	$1,399
N/A	No	No	No	No	5 Hz–20 kHz	96 dB	N/A	Pitch control; 10 hot starts; scale factor and ram editing;	$599
N/A	No	No	No	No	5 Hz–20 kHz	96 dB	N/A	Serial (RS-2326) and parallel (GPE) remote interfaces; rec/play cascade link; XLR balanced analog I/O	$899
N/A	No	No	No	No	5 Hz–20 kHz	>96 dB	N/A	Sampling-freq converter allows dir rec from digital sources (48 kHz/32 kHz)	$360
N/A	No	No	No	No	15 Hz–20 kHz	>96 dB	N/A	Editing/song search; digital sample rate converter; headphone/remote; auto-limiter	$399
N/A	No	No	No	No	20 Hz–20 kHz	N/A	<0.008%	Adjustable level-sync; AGC/limiter circuit	$1,040
N/A	No	No	No	No	20 Hz–20 kHz	>90 dB	<0.06%	20-bit A/D with super bit-mapping	$1,025
N/A	No	No	No	No	20 Hz–20 kHz	>90 dB	<0.06%	20-bit A/D with super bit-mapping; 4 D.D. motor transport	$1,765
N/A	No	No	No	No	20 Hz–20 kHz	>90 dB	<0.008%	High speed search/cue; auto-limiter; back-lit LCD	$899
N/A	No	No	No	No	20 Hz–20 kHz	>91 dB	<0.0045%	Wireless remote; self diagnostic	$1,060
N/A	No	No	No	No	20 Hz–20 kHz	>92 dB	<0.005%	Optional remote	$1,399
N/A	No	No	No	No	20 Hz–20 kHz	>112 dB (HR recording); >105 dB	<0.002% (HR recording); <0.004%	Optional remote; word sync in/thru	$2,249
N/A	No	No	No	No	5 Hz-22 kHz	>94 dB emphasis off, >98 dB emphasis on	<0.004%	Time code generator; P2 protocol; confidence monitoring	$6,999
N/A	No	No	No	No	20 Hz–20 kHz	>92 dB	<0.005%	Remote; continous recording between decks 1 & 2; simultaneous record capability	$1,899
N/A	No	No	No	No	20 Hz–20 kHz	>94 dB	<0.013%	Wireless remote	$585
N/A	No	No	No	No	20 Hz-20 kHz	>94 dB	<0.014%	Pitch control +/- 12%	$699
N/A	No	No	No	Yes	20 Hz–20 kHz	>102 dB (playback) >96 dB (playback)	<0.006%	Optional remote	$2,699
N/A	No	No	No	No	20 Hz–20 kHz	96 dB	0.012%	Cut and paste editing	$1,399

SEE PAGE 174 FOR A COMPLETE LISTING OF MANUFACTURERS' CONTACT INFORMATION

HAFLER HAS IT ALL.

HAFLER TRM8.1 Powered Monitors and P3000 Power Amplifier
Scrap 60 Productions
Steve Regina, Rob Caggiano, Eddie Wohl
Credits include: Anthrax; Dry Kill Logic; Ill Nino

TRM 8.1

P3000

RELIABILITY:

- SMT (Surface Mount Technology), state-of-the-art manufacturing process provides consistency that's second to none.
- The best warranty in the industry.

POWER/PERFORMANCE:

- HAFLER exceeds the competition with amplifiers ranging from 40 to 1400 watts, 70 and 100 volt capability and the most conservative rating system in the industry.
- From the economic M5 (5.25") passive two-way system, to the insurmountable TRM12.1 (12") active down-firing sub-woofer, Hafler is the professional monitoring solution.

SOUND QUALITY:

- Trans-nova, Trans-ana and DIAMOND are HAFLER's patented circuit technologies that provide superior sound quality by configuring output MOSFETS to amplify both voltage and current. A simpler audio signal path generates a more accurate reproduction of your mix. Something no other Speaker/Amplifier manufacturer can offer.

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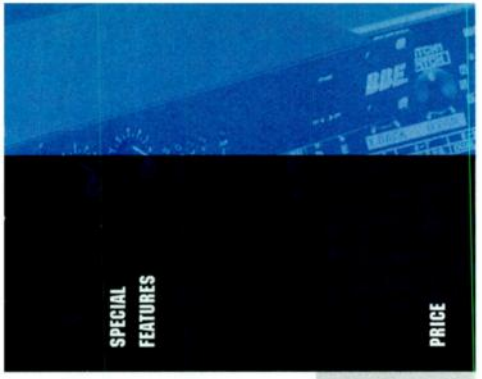
THE PROFESSIONAL STANDARD FOR MORE THAN 25 YEARS

DIRECT BOXES

MANUFACTURER	PRODUCT	TYPE	POWER	# OF CHANNELS	INPUTS	OUTPUTS	GROUND LIFT
Aguilar	DB900 Tube Direct Box	Floor	AC 100V/120V/230V	1	1/4"	XLR bal; 1/4" unbal	Yes
Anthony DeMaria Labs	100-G	Floor	100-VAC, 120, 220, 240	1	1/4"	XLR; 1/4"	Yes
Anthony DeMaria Labs	300 G	Floor or rackmount	External AC	2	1/4"	(2) 1/4" ; (2) XLR	Yes
A.R.T.	PDB	Passive	Passive	1	1/4"	XLR	Yes
Avalon Design	U5	Rackmount	Active AC	1	(2) 1/4"	1/4"; XLR	Yes
Bellari	ADB3	Floor	External AC	2	(4) 1/4"	(2) XLR	Yes
Behringer	Ultra DI Pro DI4000	4-ch Di box/peak converter	N/A	4	1/4"; XLR	XLR	Yes
Behringer	Ultra DI DI100	Active DI box	Phantom	1	1/4", XLR	XLR	Yes
Boss	DI-1	Floor	Battery; phantom	1	1/4"	1/4"; XLR	Yes
BSS Audio	AR133	Floor	Battery; phantom	1	1/4"; XLR	1/4"; XLR	Yes
BSS Audio	AR416	Rackmount	Internal AC	4	(4) 1/4"	(4) 1/4" ; (4) XLR	Yes
Carvin	FDR60	Floor	Passive	1	1/4"	XLR	Yes
Countryman	Type 85	Floor	Battery; phantom	1	1/4"	1/4"; XLR	Yes
D.W. Fearn	VT-I/F Instrument Interface DI	Vacuum tube DI	AC	2	(2) 1/4"	(2) 1/4"	Yes
Demeter	VTDB Tube Direct Box	Floor	AC	1	1/4"	1/4"; XLR	Yes
Demeter	STDB-2 Stereo Direct Box	Rackmount	AC	2	(2) 1/4"	(2) 1/4"; XLR	Yes
Demeter	H DI-1 Tube Direct Box/Line Driver	Rackmount	AC	2	(2) 1/4"	(2) 1/4"; (2) XLR	Yes
Digital Music	Cab-Tone	Standalone	Battery	1	1/4"	1/4"; XLR	Yes
DOD	AC275	Floor	AC; battery; phantom	1	(2) 1/4"; XLR	(2) 1/4"; XLR	Yes
DOD	AC260/AC265	Floor	Passive	1	(2) 1/4"; XLR	(2) 1/4", XLR	No
E.M.O.	E520	Floor	Passive	1	(5) 1/4"	XLR	Yes
E.M.O.	E525	Floor	Passive	2	(10) 1/4"	(2) XLR	Yes
E.M.O.	E535	Rackmount	Passive	1	(10) 1/4"	XLR	Yes
E.M.O.	E545	Rackmount	Passive	6	(30) 1/4"	(6) XLR	Yes
E.M.O.	E580	Rackmount	Passive	8	(8) 1/4"	1/4"; XLR	Yes
E.M.O.	E540	Floor	Passive	1	(5) 1/4"	XLR	Yes
Ebtech	LLS-8	Rackmount	Passive	8	(8) 1/4"	(8) 1/4"	No
Ebtech	LLS-2 PKG	Table or equip. mount	Passive	2	(2) 1/4"	(2) 1/4"	No
Fishman	Pro-EQ Platinum	Solid state preamp/DI/EQ	Battery; AC	1	1/4"	(2) 1/4"; XLR	Yes
Gepco	GDB-1	Floor	Passive	1	(2) 1/4"	XLR	Yes
Horizon Music	Active Direct Box	Active DI box	Battery	1	1/4"	1/4"	Yes
Horizon Music	SL-4	4-channel rackmount	Passive	4	1/4"	XLR	Yes
Horizon Music	Speaker Line	Speaker level direct box	Passive	1	1/4"	1/4"	Yes
Horizon Music	Stereo Line Direct Box	Multimode	Passive	2	(2) 1/4"	(2) 1/4"	Yes
Horizon Music	Straightline	Passive	Passive	1	1/4"	1/4"	Yes
Jensen	Iso-Max DB-2PX	Standalone or rackmount	Passive	2	(2) 1/4"	(2) XLR	Yes
Klark-Teknik	LBB100	Floor	Phantom	1	(2) 1/4" ; XLR	XLR	Yes
Manley Labs	Stereo Tube Direct Interface	Tube DI box	Passive	2	1/4"	1/4"; XLR	Yes
Manley Labs	Tube Direct Interface	Tube DI box	Passive	1	1/4"	1/4"; XLR	Yes
Palmer Direct	PAN-01	Mono passive DI box	Passive	1	1/4"	XLR	Yes
Palmer Direct	PAN-02	Mono active DI box	9V battery/48V phantom	1	1/4"	XLR	Yes
Palmer Direct	PAN-03	Rackmount	AC 110V	4	1/4"	XLR front to rear	Yes
Palmer Direct	PAN-04	Passive DI Box	Passive	2	1/4"	XLR	Yes
Palmer Direct	PDI-01	Passive DI Box	Passive	1	1/4"	XLR	Yes
Palmer Direct	PDI-02	Active DI Box	9V battery/48V phantom	1	1/4"	XLR	Yes
Palmer Direct	PDI-09 Direct Recording Device	Mono	Passive	1	1/4"	1/4"; XLR	Yes
Palmer Direct	PGA-04 (for guitar)	Rackmount	Passive	1	1/4"	1/4"; XLR	Yes
Palmer Direct	PGA-03 Guitar Y Box	Guitar	Battery; external AC	1	1/4"	(2) 1/4"	None required
Palmer Direct	PGA-05 (for guitar)	Rackmount	Internal AC	2	(2) 1/4"	1/4"; XLR	Yes
Peavey	EDI	Floor	Passive	1	1/4"	1/4"; XLR	No
Peavey	ID-1G	Floor	Passive	1	1/4"	(2) XLR	Yes
Peavey	1:1 Interface	Floor	Passive	1	1/4"; XLR	1/4"; XLR	Yes
Peavey	EDB-1	Floor	Active; phantom; battery; 16 V AC/DC external	1	1/4"	1/4"; XLR	No
Pro-Co	CB-1	Floor or rackmount	Passive	1	1/4"	1/4"; XLR	Yes



SPECIAL FEATURES	PRICE
Durable steel chassis; LED; 10 year warranty	$529
ube design; 10-MEG input for interface with a wide variety of instruments	$599
Gain	$899
3-stage attenuation switch	$40
Variable gain; hi-cut filter; optional rack kits	$595
Tube-based; 20 dB gain	$200
Direct connection of amp outs up to 3000W	$229
Direct connection of amp outs up to 3000W	$79
Auto power-off; phase inverse	$150
0/-20/-40 dB pads	$185
0/-20/-40 dB pads; LP filter; phase reverse	$899
Input attenuation -0, -20, -40 dB	$25
Isolates ground even w/ phantom power	$232
	$1,500
ensen output transformers; tube-buffered output	$600
All-tube construction; 27 Mohm input	$1,100
Tube-buffered 1/4" outputs	$899
Guitar cabinet simulator; bal/unbal I/O levels	$150
Speaker/instrument level switch	$95
Can be used as mic/instrument splitter; 3-position pads	$65/260; $85/265
20 Hz–40 kHz frequency response	$124
20 Hz–40 kHz frequency response	$360
20 Hz–40 kHz frequency response	$130
20 Hz– 40 kHz freq. response; uses E535 mods	$745
Parallel unbalanced outputs	$1,225
High isolation operation	$190
Converts between -10/+4 dBu equipment	$345
Includes 4 RCA adapters; hum elimination	$90
Semiparametric EQ; sweepable mid w/notch	$250
20 dB pad	$28
-20 dB pad switch; adjustable output gain trim	$150
	$1,209
Accepts guitar amp outputs	$70
Works as stereo or 2 in/1 out mono combiner	$99
cepts line level signals from consoles/keyboards	$49
Jensen JT-DB-EPC transformer	$210
Switchable I/O attenuation; iso transformer	$175
5-position EQ; all-tube architecture	$875
5-position EQ; console boost-unity switch	$575
0 dB/-30 dB switch	$45
0 dB/-30 dB switch	$56
30 dB pad/channel	$198
0 dB/-30 dB switch	$79
0/-20/-40 dB switch	$91
0/-20/-40 dB switch	$195
Variable tone and output attenuation switches	$120
Integrated 8 ohm load box; filter section	$460
Isolated transformer Y-box	$110
Filter section	$660
Includes timbre adjustment	$60
	$50
	$60
	$70
	$60

More Power!

From page 20, More Power!

of measuring IM distortion was developed by the Society of Motion Picture and Television Engineers (SMPTE), so this spec is often indicated as IM (SMPTE). IM values tend to be lower than THD values; anything below 0.1 percent is fine.

Signal-to-noise ratio (S/N) is the difference in decibels between the maximum undistorted signal level and the noise floor of the equipment. In power amps, S/N is the ratio of the maximum output power to the residual noise level (typically measured with the inputs shorted out, which produces slightly better results). In addition, S/N is sometimes measured across the full audio bandwidth and sometimes measured with A weighting, which takes into account the ear's increased sensitivity to midrange frequencies. In general, a S/N over 100 dB (20 Hz to 20 kHz) is fine for a quiet room.

Slew rate is an amp's ability to reproduce a quickly changing voltage in the input signal. (The rate at which the voltage changes in a signal is called the *rise time*.) Slew rate is measured in volts/microsecond; i.e., if the input signal jumps instantaneously from zero to maximum, how quickly does the output rise? The higher the slew rate, the "faster" the amp, which translates into broader power bandwidth and better reproduction of high frequencies and fast transients as well as any waveform with a fast rise time. Values above 10 or 20 volts/microsecond are generally fine, but if the slew rate is too high, it could indicate a susceptibility to high-frequency or RF instability.

Damping factor is the ratio of the load (speaker) impedance to the amp's output impedance. The input impedance of an analog audio connection should be at least ten times the output impedance. In the case of a power amp, the input impedance of a speaker should be at least 200 times the output impedance of the amp. If the speaker has an input impedance of 8Ω, the output impedance of the amp should be no more than 0.04Ω. The higher this ratio (i.e., the lower the output impedance), the better the amp can overcome the inertia of the speaker's moving voice coil and control its motion, resulting in less speaker distortion. Values of 200 and above are fine.

However, the amp's damping factor might be negligible compared to the overall system damping, which is determined largely by the impedance of the speaker wire (from the amp to the speaker and in the speaker itself), passive crossovers (especially lowpass filters that include inductors with yards of wire in series with the speaker), and connectors (¼-inch connectors are notoriously poor in this regard). As a result, the overall system damping factor might be 30 or 40, even when using amps with damping factors in the thousands.

To improve this situation, use large-gauge speaker wire (at least 12 to 14 gauge) that is as short as possible, and use low-impedance connectors, such as binding posts or Neutrik Speakons. In addition, active crossovers increase the system damping quite a bit; in this case, it's a good idea to use biamping or triamping to power each speaker driver independently. This is the single best way to improve the bass performance of the system. Finally, use 8Ω speakers; reducing the speaker impedance by 50 percent cuts the system damping factor in half.

As mentioned earlier, many power amps include protection against thermal overload, DC offset, and clipping. In addition, some amps offer protection against loud transients when you turn the amp on or off, input overload, AC short circuits, RFI, and subsonic and ultrasonic frequencies that waste amplifier power.

Although specs are important indicators of a power amp's performance, they don't tell the whole story. In fact, some amps have relatively poor specs but sound fabulous whereas other amps have spectacular specs and sound lousy. Ultimately, you must let your ears be the judge. ■

EM *contributing editor* **Scott Wilkinson** *always likes more power.*

DIRECT BOXES

MANUFACTURER	PRODUCT	TYPE	POWER	# OF CHANNELS	INPUTS	OUTPUTS	GROUND LIFT
Pro-Co	DB-1	Floor or rackmount	Passive	1	1/4"	1/4"; XLR	Yes
Pro-Co	DB-4A	Rackmount	Passive	4	1/4"	1/4"; XLR	Yes
Pro-Co	IT 1 Balancing Box/AV 1	Floor or rackmount	Passive	1	1/4"; XLR	1/4"; XLR	Yes
Pro-Co	AVP 1	Wall plate	Passive	1	1/4"; RCA; XLR	Barrier strip	Yes
Pro-Co	MS 3/MC 2/MS2	Floor or rackmount	Passive	1	XLR	(3) XLR	Yes
Pro-Co	MS 42A	Rackmount	Passive	4	XLR	(3) XLR	Yes
Pro-Co	MS 43A	Rackmount	Passive	4	XLR	(3) XLR	Yes
Pro-Co	MS 82	Rackmount	Passive	8	Barrier strip	Barrier strip	Yes
Pro-Co	MS 83	Rackmount	Passive	8	Barrier strip	Barrier strip	Yes
Radial Engineering	J-48	Floor	48V phantom	1	1/4"	XLR	Yes
Radial Engineering	JD4	Rackmount	Passive	4	(16) 1/4"	(4) XLR	Yes
Radial Engineering	JDI Mark III	Floor	Passive	1	(2) 1/4"	XLR	Yes
Radial Engineering	JDV	Floor	Active	1	(2) 1/4"	XLR	Yes
Rapco	ADB+8	Floor	Battery; phantom	1	1/4"	1/4"; XLR	Yes
Rapco	DBR400	Rackmount	Passive	4	(4) 1/4"	(4) 1/4"; (4) XLR	Yes
Rapco	DB-100	Floor	Passive	1	1/4"	(4) 1/4"; (4) XLR	Yes
Rapco	DB-101SL	Floor	Passive	1	1/4"	(4) 1/4"; (4) XLR	Yes
Raven Labs	APD-1 Active/Passive Direct	Floor	Battery; external AC	1	(2) 1/4"	XLR	Yes
Raven Labs	MDB-1 Mixer/Direct Box/Buffer	Active DI/3-channel mixer	Battery; external AC	3 in/1 out	(5) 1/4"	XLR; 1/4"	Yes
Roland	DI-1	Floor	Battery; phantom	1	1/4"	1/4"; XLR	Yes
Rolls	ADi6 dB Max	Floor	9V; phantom	1	1/4"	XLR	Yes
Rolls	RDB104	Rackmount	Internal AC	4	(8) 1/4"	(4) XLR	Yes
Rolls	RPB623 Phantom Hex	Rackmount	120 VAC	6	XLR	1/4"	No
Rolls	ADB2	Floor	Phantom	1	(2) 1/4"	XLR	Yes
Rolls	DB25	Floor	Passive	1	(2) 1/4"	XLR	Yes
Stewart Audio	ADB-1	Floor	Passive	1	1/4"	1/4"; XLR	Yes
Stewart Audio	ADB-4	Floor or rackmount	External; phantom	4	(4) XLR	1/4"; (4) XLR	Yes
Summit Audio	TD-100	Floor or rackmount	AC 110V	1	1/4"	1/4"; XLR	Yes
Tech 21	SansAmp Acoustic DI	FET solid state floor	Phantom; 9V batt; opt DC power supply	1	(2) 1/4"	1/4"; XLR	Yes
Tech 21	SansAmp Bass Driver DI	FET solid state floor	Phantom; 9V batt; opt DC power supply	1	1/4"	(2) 1/4"; XLR	Yes
Tech 21	SansAmp Bass XDI	DI box	Phantom; 9V batt; opt DC power supply	1	(2) 1/4"	1/4"; XLR	No
Tech 21	SansAmp Classic	FET solid state floor	9V batt; included DC power supply	1	1/4"	1/4"	No
Tech 21	SansAmp GT2	FET solid state floor	9V batt; included DC power supply	1	1/4"	1/4"	No
Tech 21	SansAmp PSA-1	FET solid state 1U rackmount	AC 110V-240V	2	(2) 1/4"	(2) 1/4"; (2) XLR	No
Tech 21	SansAmp RBI	FET solid state 1U rackmount	AC 110V-240V	1	(2) 1/4"	(2) 1/4"; (2) XLR	No
Tech 21	SansAmp Tri-A.C.	FET solid state floor	9V batt; included DC power supply	3	1/4"	1/4"	No
Tech 21	SansAmp XDI	Floor	Phant; 9V batt; opt DC pwr supp	1	(2) 1/4"	1/4"; XLR	No
The John Hardy Co.	AMB Tube Buffered Direct Injection Box	Tube buffered	AC power 110/220VAC	1	1/4"	(2) 1/4"; XLR	Yes
Tube Works	4001	Floor	External AC	1	1/4"	(2) 1/4"; XLR	Yes
Tube Works	4002	Rackmount	External VAC	2	(2) 1/4"	(2) 1/4"; (2) XLR	Yes
Whirlwind	HotBox	Floor	Battery; phantom	1	1/4"	1/4"; XLR	Yes
Whirlwind	HotBox Quad	Rackmount	Internal AC; phantom	4	(4) 1/4"	(4) 1/4"; (4) XLR	Yes
Whirlwind	Director	Floor	Passive	1	1/4"	1/4"; XLR	Yes
Whirlwind	Multi Director	Rackmount	Passive	4	(4) 1/4"	(4) 1/4"; (4) XLR	Yes
Whirlwind	IMP 2	Floor	Passive	1	1/4"	1/4"; XLR	Yes
Whirlwind	Direct 2 Dual	Dual direct box	Passive	2	(2) 1/4"	(2) 1/4"; (2) XLR	Yes, 1/ch
Whirlwind	EDB-1	Floor	Passive	1	1/4"	XLR; 1/4"	Yes
Whirlwind	PCDI	Floor	Passive	2	(2) RCA; 1/8"	(2) XLR; (2) RCA	Yes

SPECIAL FEATURES	PRICE
Line/speaker level in; high cut filter	$110
Line/speaker level in; high cut filter	$340
Line/speaker level in; high cut filter	$124
Line/speaker level in	$131
	$130/$136/$111
Microphone splitting features	$310
Microphone splitting features	$381
Phantom bus available on P model	$650-$673
Phantom bus available on P model	$834-$947
merge to mix 2 inputs to mono; 80 Hz rumble filter; polarity reverse (180 deg.) and 15 dB pad	$199
Merged input pairs; ultrasonic noise filter	$900
Merged inputs; -15 dB pad switch	$199
Uses NiCad rechargeable batteries	$300
Mic level/unity gain/+8 dB forward gain switch	$208
4 units housed in 1U rackspace	$249
Ground-lift jack	$50
Accepts instrument/speaker level signals	$60
Sidechain effects loop w/ assign switch	$349
Mute; tuner send; effects loop; inst. presets	$299
Auto power-off; phase inverse switch	$150
	$90
	$200
Dynamic microphone; phantom power supply	$150
3-position attenuation switch	$50
3-position attenuation switch	$35
Transformerless design	$109
ectable input sensitivity; ground lift on each channel	$379
Instrument preamp & DI; phase control; power headphones; variable impedance	$495
Semi-parametric EQ; tube/mic emulation	$225
Bass tube amp emulation; active bass/treble; drive, presence, blend controls	$225
strument interface for computer sound cards and mixing consoles	$95
e amp emulations; mult preamp styles; 8 character switches/4 knobs contour	$345
Streamlined version of SansAmp Classic; sel amp type/mod/spkr cab/mic plcmnt configs	$195
ly programmable; 100% analog tube amp emulator; 49 presets/49 user	$795
ass tube amp emulation; 3-band active EQ; drive, presence, blend controls	$395
Fully programmable; 100% analog	$225
Low noise FET technology	$95
Switchable 15 dB boost circuit for Jensen output	$595
Speaker/normal switch; XLR boost	$219
Speaker/normal switch; transformerless DC out	$395
Instrument/amplifier switch	$160
Instrument/amplifier switch	$395
Instrument/amplifier switch; LP switch	$110
Instrument/amplifier switch; LP switch	$400
	$60
-20 dB pad switch per channel	$199
0, -20, -40 dB pad switch	$30
Interfaces with computer sound cards	$199

By Bobby Owsinski

INSTRUMENT-SPECIFIC EQ TIPS

• For Snare—To find the "point" on the snare, boost the upper midrange starting at about +5 or 6 dB at 2 kHz or so. Open up the bandwidth (if that parameter is available) until you get the snare to jump out, then tighten the bandwidth until you get only the part of the snare sound that you want most. Then fine-tune the frequency until you need the least amount of boost in order to make it jump out of the mix.

• For Bass—The ratio between the low bass (80–120 Hz) and the mid-bass (130 Hz–200 Hz) is important. Try using two fairly narrow peaking bands, one at 100 Hz and another at 140 Hz and boost one and cut the other. If the bass is too warm, sometimes reducing the upper band can make it more distinct without removing the deeper fundamentals that live in the 100 Hz band. Also, try boosting some of the 1 kHz area since this is where a lot of the sound of the Fender bass lives.

• For Fatter Guitars—Boost midrange a lot (9 dB or so) and sweep the frequencies until you hear the range where the guitar sounds thick but yet still bright enough to cut through. Now, back the boost down to about +4 or so until the guitar cuts through the mix without being too bright.

• For Vocals—Boost a little at 125 Hz to 250 Hz to accentuate the voice fundamental and make it more "chesty"-sounding. The 2 kHz to 4 kHz range accentuates the consonants and makes the vocal seem closer to the listener.

Instrument	Magic Frequencies
Bass Guitar	Bottom at 50-80 Hz; attack at 700 Hz; snap at 2.5 kHz
Kick Drum	Bottom at 80-100 Hz; hollowness at 400 Hz; point at 3-5 kHz
Snare	Fatness at 120-240 Hz; boing at 900 Hz; crispness at 5 kHz; snap at 10 kHz
Toms	Fullness at 240-500 Hz; attack at 5-7 kHz
Floor Tom	Fullness at 80-120 Hz; attack at 5 kHz
Hi Hat and Cymbals	Clang at 200 Hz; sparkle at 8 to 10 Hz
Electric Guitar	Fullness at 240-500 Hz; presence at 1.5-2.5 kHz; reduce 1 kHz for 4x12 cabinet sound
Acoustic Guitar	Fullness at 80 Hz; body at 240 Hz; presence at 2-5 kHz
Organ	Fullness at 80 Hz; body at 240 Hz; presence at 2-5 kHz
Piano	Fullness at 80 Hz; presence at 2.5-5 kHz; honky-tonk at 2.5 kHz
Horns	Fullness at 120 Hz-240 Hz; piercing at 5 kHz
Voice	Fullness at 120 Hz; boominess at 240 Hz; presence at 5 kHz; sibilance at 5 kHz; air at 10-15 kHz
Strings	Fullness at 240 Hz; scratchiness at 7-10 kHz
Conga	Ring at 200 Hz; slap at 5 kHz

FIG. 1: Instrument tips.

GENERAL TIPS

• Use a narrow Q (bandwidth) when cutting; use wide Qs when boosting.

• If you want something to stick out, roll off the bottom; if you want it to blend in, roll off the top. ■

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DRUM MACHINES

MANUFACTURER	PRODUCT	# OF PADS / TOUCH SENSITIVE	NON-PERCUSSION SOUNDS	ONBOARD EFFECTS	# OF SOUNDS	# OF PATTERNS PRESET / USER
Akai	MPC2000XL MIDI Production Center	16/Yes	Yes	Optional 4-bus effects processor	Unlimited	0/99
Akai	MPC2000XL-ZP	16/Yes	Yes	Yes	64	0/99
Akai	MPC4000	16/Yes	Yes	Yes	Unlimited	0/128
Alesis	SR-16	12/Yes	223	No	100	200/200
Boss	DR-202	8/No	Yes (bass)	Reverb, chorus	256	400/100
Boss	Dr. Rhythm	16/Yes	4 (bass)	Reverb, delay, flanger	255	400/400
E-mu	MP-7 Command Station	13/Yes	Yes	Yes	512 factory/512 user	0/0
E-mu	MP-7 Command Station 7760	13/Yes	Yes	Yes	512 factory/512 user	100+
E-mu	XL-7 Command Station	13/Yes	Yes	Yes	512 factory/512 user	0/0
E-mu	XL-7 Command Station 7750	13/Yes	Yes	Yes	512 factory/512 user	100+
Jomox	AiRBase-99	Yes	No	No	Unlimited	200
Jomox	XBase-09	4/Yes	Yes (white noise)	No	Unlimited	64
Korg	Electribe EM-1	10/No	Yes	Yes	194	256/256
Korg	ER-1	8/No	No	delay, flange/chorus, ring mod.	Unlimited	224/32
Roland	MC-307 Groovebox	16/Yes	64	Reverb, chorus, multi	800	710/200
Vermona	DRM1 Mk II	N/A	No	Yes	8 (programmable)	0/0
Yamaha	RY9	12/No	50	No	128	200/50
Yamaha	RY20	12/Yes	6 (bass)	Reverb, delay	300	300/600
Zoom	MRT-3	7/No	No	No	TBA	200/99
Zoom	Rhythmtrak 123	13/Yes	Yes (bass)	Yes	80 drum kits; 25 bass programs	297/99
Zoom	Rhythmtrak 234	13/Yes	Yes (bass)	Yes	124 drum kits; 50 bass programs	99/99
Zoom	RT323	13/Yes	Yes	No	432	400/100

By Bobby Owsinski

DYNAMICS PROCESSING TRICKS AND TIPS

- For Snare—It's often useful to gate the effects send on the snare so it only triggers with forceful hits. Send the snare direct out of its channel to another channel on the board and gate this new channel. This channel generally is not sent to the main mix, but can be. You can then EQ the new channel and send it to a reverb/EFX unit. By adjusting the threshold you can control the signal sent to the effects unit. This simple technique allows a different effect to be placed on the snare during harder hits and prevents leakage to the effect during things such as tom hits and kick drumbeats.

- For Drums—When gating drums, set the range so it attenuates the signal only about 10 or 20 dB. That lets some of the natural ambience remain and prevents the drums from sounding choked.

- For Piano—If you liked the early Elton John piano sound, put the piano into two UREI LA-2A's or similar compressors and compress the signal a large amount (at least 10 dB). Then put the output into two Pultecs or similar equalizers. Push 14 kHz all the way up and set 100 Hz to about 5. The effect should be a shimmering sound. The chords hold and seem to chorus.

- For Vocal—A good starting point for a lead vocal is a 4:1 ratio, medium attack and release, and the threshold set for about 4 to 6 dB of gain reduction.

- For Bass—Using a dbx 160X set at a ratio of infinity:1 (the highest ratio), set the threshold for a 3 dB or 4 dB reduction. This will keep the bass solid and unmoving in the mix.

- For Guitar—Higher ratios of 8:1 or 10:1 sometimes work well, with the threshold set so that the guitar cuts through the track. Attack and release should be timed to the pulse of the song. ■

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# SONGS	QUANTIZATION TYPES/PPQN	# OF OUTPUT/TYPE	PORTS MIDI IN/OUT/THRU	SPECIAL FEATURES	PRICE
20	1/8, 1/16, 1/32 and triplets; 96	(2) 1/4"	Y/Y/N	Reads Roland & E-mu libraries; BPM matching time stretch; SE1, SE2, SE3 special edition w/enhanced graphics; automated mixing; 64 tracks; 300K note sequencer	$1,749
20 (user only)	Off, 1/8, 1/8(3), 1/16, 1/16(3), 1/32, 1/32(3)/96ppq	(2) 1/4" TRS (8-out optional)	Y/Y/N	100 MB ZIP drive w/ 50 MB AKAI drum sounds; graphic flip-up display; real-time control: Timestretch; resample; Beat Loop function; tap tempo	$1,649
128 (user only)	Off, 1/8, 1/8(3), 1/16, 1/16(3), 1/32, 1/32(3), 1/64, 1/64(3)/96ppq	(2) XLR/1/4" combo (8-out optional)	Y/Y/N	60 GB HD; CD burner; sample streaming; 272 MB RAM exp to 512 MB; (6) real-time controller: wordclock; SMPTE; optional ADAT I/O	$3,999
100	96	(4) 1/4"	Y/Y/Y	Includes start/stop, A-B fill/count footswitches	$269
50	96	(2) RCA	Y/Y/N	Roll button	$495
100	96	(3) 1/4"; phones	Y/Y/N	Search; 16 effects; 128 drum kits	$495
512	32d triplets/384	(6) 1/4" TRS; S/PDIF	Y/Y/Y	USB; expandable sounds	$1,329
128	1/4 to 1/64 w/swing/384	(6) 1/4"; S/PDIF	YY/Y	16 ARPS, 16 real-time knobs; aftertouch	$1,695
512	32d triplets/384	(6)1/4" TRS; S/PDIF	Y/Y/Y	USB; expandable sounds	$1,329
128	1/4 to 1/64 w/swing/384	(6) 1/4"; S/PDIF	Y/Y/Y	16 ARPS, 16 real-time knobs; aftertouch	$1,695
200	N/A	(10) 1/4"	Y/Y/Y	Fully analog electronics	$995
64	N/A	(4) 1/4"	Y/Y/Y	Fully analog electronics; onboard sequencer	$1,095
16	16, 16T, 32, 32T	(2) 1/4"; phones	Y/Y/Y	Drums plus 2 synth parts; 16-step sequencer; 11 types of insert effects	$499
16	12 triplet; 16; 16 swing/32	(2) 1/4"; phones	Y/Y/Y	Motion sequencer; analog-modeled sounds	$399
N/A	Grid; groove; shuffle/8	(2) 1/4"	Y/Y/N	Grab switch; turntable emulation	$995
0	N/A	(10) 1/4"	N/N/N	True analog drum synthesizer	$599
100	16th note/24	(2) 1/4"; phones	Y/Y/N	Guitar input w/ tuner and mono pitch-to-MIDI	$300
50	Normal; swing; groove/96	(2) 1/4"; phones	Y/Y/N	4 tracks /patterns; programmable bass lines	$500
99	N/A	(2) 1/4"	Y/N/N		$230
99	96	(2) 1/4"; phones	Y/N/N	External input for playing along with unit	$300
99	96	(2) 1/4"; phones	Y/N/N	3 drum, 1 bass track	$400
100	N/A	(4) 1/4"; 1/8"	Y/Y/Y		$550

DYNAMICS PROCESSORS

MANUFACTURER	MODEL	TYPE	THRESHOLD	RATIO	ATTACK TIMES	RELEASE TIMES
Alesis	3630	Compressor/limiter/gate	-40 to 20 dB	1:1 to ∞:1	0.1 to 200 ms/prog dependent	50 ms to 3 sec
Alesis	NanoCompressor	Compressor/limiter	-40 to 8 dB	1:1 to ∞:1	Auto or man (0.1 to 200 ms)	Auto or man (50 ms to 3 sec)
Anthony DeMaria Labs	1000	Compressor/limiter	Fixed	3:1 to 12:1	Auto (10 µs)	Auto (0.07 sec)
Anthony DeMaria Labs	1500	Compressor/limiter	Fixed	3:1 to 12:1	Auto (10 µs)	Auto (0.07 sec)
Aphex Systems	105	Logic-assisted noise gate	-50 to 20 dB	∞:1	Manual (200 to 250 ms)	Manual (150 ms to 4 sec)
Aphex Systems	108 Easyrider	2-channel compressor	Fixed	1:1 to 5:1 (prog dep)	Auto	Auto w/2 sel. ranges
Aphex Systems	320A Compellor	Compressor/leveler/limiter	Fixed	Comp: 1:1–3:1; lim: ∞:1	Auto (1 µs to 2.5 sec)	Auto w/2 sel. ranges
Aphex Systems	622 Expander/Gate	Expander/gate	-50 to 20 dB	Gate: ∞:1; exp: 1.2:1–10:1	Manual (10 to 100 µs)	Manual (40 ms to 5 sec)
Aphex Systems	661 Expressor	Tube compressor	-30 to 20 dB	1.1:1 to 30:1 (manual); no-knee (auto)	Auto or manual (0.05 to 100 ms)	Auto or manual (40 ms to 4 sec)
Aphex Systems	720 Dominator II	Peak limiter	-9 to 25 dB	∞:1	Auto	Auto and manual
API	525	Single-channel compressor	Variable: ∞ to 0 VU	2:1 or 20:1	15 ms	0.1 to 2.5 sec
A.R.T.	Dual Leveler	Tube compressor	-40 to 10 dB	Comp: 2.3:1; lim: 6:1	Auto/fast	Auto/fast
A.R.T.	Pro VLA	Tube compressor	-20 to 15 dB	2:1 to ∞:1	Fast/slow	Fast/slow
A.R.T.	Tube Compressor	Tube compressor	-40 to 10 dB	Comp: 2.3:1; lim: 6:1	Auto/fast	Auto/fast
Ashly Audio	CLX 51	Compressor/limiter	-40 to 22 dBu	2:1 to ∞:1	Manual (200 µs to 20 ms)	Manual (100 ms to 3 sec)
Ashly Audio	CLX 52	Dual-channel compressor/limiter	-40 to 22 dBu	2:1 to ∞:1	Manual (200 µs to 20 ms)	Manual (100 ms to 3 sec)
Avalon Design	AD2044	Compressor	-24 to +20 dB	1:1 to 20:1	0.5 ms to 150 ms	80 ms to 5 sec
Avalon Design	VT-747SP	Class A opto-compressor	-30 to 20 dB	1:1 to 20:1	2 to 200 ms	10 ms to 5 sec.
BBE	362 Sonic Maximizer	Audio enhancer	N/A	N/A	N/A	N/A
BBE	362NR Sonic Maximizer	Audio enhancer	N/A	N/A	N/A	N/A
BBE	362SW Sonic Maximizer	Audio enhancer	N/A	N/A	N/A	N/A
BBE	482 Sonic Maximizer	Audio enhancer	N/A	N/A	N/A	N/A
BBE	882 Sonic Maximizer	Audio enhancer	N/A	N/A	N/A	N/A
Behringer	Autocom Pro MDX1400	2-channel compressor/ limiter/expander/enhancer/gate	(Comp) -40 to 20 dB (exp/gate) off to 10 dB	(Exp./gate) 1:1 to 1:8; (comp.) 1:1 to >1:8	Compressor: auto, 15 ms; 5 ms; 3 ms	Compressor: auto; program dependent
Behringer	Composer Pro MDX2200	2-channel compressor/ limiter/expander/gate	-40 to 20 dB	1:1 to ∞:1	Variable (1 to 150 ms)	Variable (0.05 ms to 5 sec/20 dB)
Behringer	Multicom Pro MDX4400	4-channel compressor/limiter	-40 to 20 dB	1:1 to >:1	15 ms at 10 dB, 5 ms at 20 dB, 3ms at 30 dB	Program dependent, typ. 125 dB
Behringer	Multigate Pro XR4400	4-channel expander/gate	Bypass to 10 dBu	1:1 to 1:4	Program dependent	Variable (50 ms to 4 sec)
Behringer	Super-X CX2310	Stereo/3-way mono crossover/xband limiters	-6 to 18 dBu	N/A	N/A	N/A
Behringer	Tube Composer T1952	Expander/gate/compressor/ limiter/peak limiter	-40 to +20 dB	1:1 to ∞:1	1 to 150 ms	50 ms to 5 sec
Behringer	Ultra-Dyne Pro DSP9024	6-band dynamic processor	- 70 to 0 dB	1:1 to ∞ (90):1	0 to 255 ms	50–5,000 ms
Behringer	Ultramizer Pro DSP1400P	2-band compressor/ leveler/loudness ultramizer	-48 to 0 dB	Density 0 - 100	0 to 100 ms	Speed 0 to 100
Bellari	LA120	Tube compressor/limiter	-20 to 20 dB	Switchable 2:1, 10:1	Program dependent	Program dependent
Bellari	RP583	Tube compressor/limiter	-20 to 20 dB	2:1 to ∞:1	Manual (0.5 to 100 ms)	Manual (1 to 2 sec)
BSS Audio	DPR402	Compressor/de-esser/limiter	-30 to 20 dBu	1:1 to ∞:1	Manual (50 µs to 80 ms)	Auto or manual (5 ms to 5 sec)
BSS Audio	DPR404	Quad compressor	-30 to 20 dBu	1:1 to ∞:1	Auto	Auto
BSS Audio	DPR422	Dual compressor/de-esser	-30 to 20 dB	1:1 to ∞:1	Auto or manual (50 µs to 400 ms)	Auto or manual (5 ms to 5 sec)
BSS Audio	DPR504	Quad gate	-50 to 20 dBu	N/A	Auto (20 µs or 40 µs to 5 ms) program dependent	Manual (1 ms to 3 sec)
BSS Audio	DPR522	Dual gate	-60 to 15 dB	N/A	Manual (20 µs to 1.5 sec)	Manual (1 ms to 3 sec)
BSS Audio	DPR901II	Dynamic equalizer	-30 to 20 dBu	N/A	Auto	Auto
BSS Audio	DPR944	Gate/compressor	Gate: -50 to 20 dB; comp: -30 to 20 dB	1:1 to ∞:1 comp. only	Auto	Auto
Crane Song	STC-8	Class A Compressor/limiter	Auto	1:1 to 1:20	0.1 to 150 ms	Auto (40 ms to 10 sec)
Crane Song	Trakker	Discrete Class A, single channel compressor/limiter	-40 to 24 dB	1.1:1 to 20:1	Manual 0.05 to 200 ms	Auto (40 ms to 10 sec)
Crate	SM4-CL	Compressor/limiter	-20 to 20 dBu	5-position switch: 2:1, 4:1, 8:1, 12:1, 20:1	20 µs to 1.1 sec, adjustable for 100% recovery	50 µs to 1.1 sec, adjustable for 63% recovery
dbx	160A	Compressor	-40 to 20 dBu	1:1 to -1:1	Auto	Auto
dbx	166XL	Compressor/limiter	Comp: -40 to 20 dBu; lim: 0 to 20 dBu	1:1 to ∞:1	Auto	Auto

GAIN CONTROL	BYPASS SWITCH	# OF CHANNELS / STEREO LINK	METER TYPE	MAIN I/O	SIDECHAIN I/O	DIMENSIONS	SPECIAL FEATURES	PRICE
Output	Yes	2/Yes	12-seg LED	1/4"	1/4" TRS	19x1.7x4.5	Hard/soft knee; peak/RMS compression	$199
Output	Yes	2/Yes	6-seg LED	1/4"	1/4" TRS	5.5x1.75x4.5	Hard/soft knee; peak/RMS compression	$119
Input	No	1/No	VU	XLR	No	19x3.5x8	All-tube architecture	$1,695
Input	No	2/Yes	VU	XLR	No	19x3.5x9	All-tube architecture	$2,995
No	No	4/No	LED	1/4" TRS	External key input	19x1.7x5.2	Logic assist; uses VCA 1001	$449
Input/output	Yes	2/Yes	LED	1/4" TRS	No	19x1.75x5.2	Waveform-dependent compression	$299
Output	Yes	2/Yes	LED	XLR	No	19x1.75x10	Frequency-dependent leveler	$1,350
No	Yes	2/Yes	LED	XLR	1/4"	19x1.75x9	Logic assist	$795
Input/output	Yes	1/No	LED	XLR; 1/4"	1/4"	19x1.75x10.125	Auto-compression mode; hi-freq expander	$749
Input	Yes	2/Yes	LED	XLR	No	19x1.75x10	Brickwall limiter; 3-band auto limit threshold	$1,350
Yes	Yes	1/No	VU miniature GR meter	XLR when in API frame	No	N/A	Re-issue of early 70's API compressor	$1,295
Output	Yes	2/Yes	LED	XLR; 1/4"	No	19x1.75x6.5	Vactrol electro-optical tube compression	$369
Output	Yes	2/Yes	LED; VU	XLR; 1/4" TRS	No	19x3.5x6.5	Vactrol electro-optical tube compression	$679
Output	Yes	1/No	LED	XLR; 1/4"	No	5.375x2x5.25	Vactrol electro-optical tube compression	$99
Input/output	Yes	1/No	11-seg LED	XLR; 1/4"	1/4"	19x1.75x6	Infinite soft knee and timing based on comp. ratio	$379
Input/output	Yes	2/Yes	11-seg LED	XLR; 1/4"	1/4"	19x1.75x6	Infinite soft knee and timing based on comp. ratio	$539
Output	Yes	2/Yes	Analog VU	XLR	XLR	19x12x3.5		$3,000
Make-up/ output control	Yes	1/Yes	VU; (2) 20-seg LED	XLR	Yes	19x12x3.5	6-band graphic EQ; tube bypass	$2,495
No	Yes	2/Yes	1 LED clip per ch	1/4"	No	1U	Uses BBE process	$259
No	Yes	2/Yes	1 LED clip per ch	1/4"; RCA	No	1U	Uses BBE process; noise reduction	$349
No	Yes	2/Yes	5-seg LED per ch	1/4"; RCA	No	1U	Uses BBE process; subwoofer filter	$349
No	Yes	2/No	5-seg LED per ch	1/4"; RCA	No	1U	Uses BBE process; hard-wire bypass	$349
No	Yes	2/No	5-seg LED per ch	XLR; 1/4" TRS	No	1U	Uses BBE process; hard-wire bypass	$599
Yes	Yes	2/Yes	12 LEDs	XLR; phone	Yes	19x1.75x8.5	Link function; high-pass filter in sidechain	$99
No	Yes	2/No	12 LEDs	XLR; phone	Yes	19x1.75x8.5	2-ch expander/gate/compressor/limiter	$125
Yes	Yes	4/Yes	17 LEDs per ch	XLR; phone	No	19x1.75x8.5	High-pass filter in sidechain; auto compressor	$145
Yes	No	4/No	Traffic light display	XLR; phone	Yes	19x1.75x8.5	4 expander/gate circuits	$209
Yes	No	1/No	N/A	Servo balanced in; balanced outs	No	19x1.75x8.5	Adjustable delay for runtime/phase inversion	$125
Output	Yes	2/Yes	VU	XLR; 1/4" TRS	1/4"	19x8.5x3.5	Hard knee/interactive switch; 12AX7 tubes; warmth control; side chain filter	$399
Yes	Yes	2/Yes	Digital RMS and peak	XLR, 1/4" TRS	No	19x3.5x12	MIDI-controllable; optional AES/EBU I/O	$299
Yes	Yes	2/Yes	8-seg LEDs	XLR; 1/4" TRS	No	19x1.75x7.5	Includes PC remote control software	$109
Output	Yes	1/No	VU	XLR; 1/4"	No	7.6x1.6x5.4		$160
Output	Yes	2/Yes	VU	XLR; 1/4"	1/4"	19x3.5x6		$650
Output	Yes	2/Yes	5/9/12-seg LED	XLR	Barrier strip	19x1.75x9	Variable knee with comp. ratio; sidechain mon.	$1,599
No	Yes	4/Yes	15/8-seg LED	XLR	1/4"	19x1.75x11	Variable HF de-essing; progressive knee	$1,449
Output	Yes	2/Yes	5/6-seg LED	XLR	1/4"	19x1.75x8	Progressive knee; de-esser	$899
No	Yes	4/Yes	12-seg LED	XLR	1/4" TRS	19x1.75x11	External key-source facility; sidechain filter	$1,449
No	Yes	2/Yes	3/9-seg LED	XLR	1/4"	19x1.75x8	Automatic dynamics enhancement	$799
No	Yes	2/Yes	10-seg LED	XLR	No	19x1.75x9	Shelving EQ; 1 & 2 ch split; filter width control	$1,549
Output	Yes	4/Yes	12-seg LED	XLR	1/4" TRS (gate only)	19x1.75x7.1		$899
Output	Yes	2/Yes	16-seg LED	XLR	DB15	19x3.5x12	Soft knee, dual sidechain	$4,450
Output	Yes	1/No	23-seg LED	XLR	DB-9	1	Clean, vintage and clean/vintage VCA features	$2,550
Yes	Yes	2/Yes	10-seg LED	1/4" TRS	No	1.6 x5.6x 5.5	Switchable level meter displays; 1/3rd rack unit	$200
Output	Yes	1/No	LED	XLR; 1/4"	1/4" TRS	1U	Switchable hard/soft/OverEasy compression	$600
Output	Yes	2/Yes	19-seg LED	XLR; 1/4" TRS	1/4" TRS	1U	Switchable hard knee/OverEasy compression; expander	$360

SEE PAGE 174 FOR A COMPLETE LISTING OF MANUFACTURERS' CONTACT INFORMATION

DYNAMICS PROCESSORS

MANUFACTURER	MODEL	TYPE	THRESHOLD	RATIO	ATTACK TIMES	RELEASE TIMES
dbx	266XL	Compressor/expander/gate	-40 to 20 dB; exp: -60 to 10 dB	1:1 to ∞:1	Auto or manual	Auto or manual
dbx	1046	Quad compressor/limiter	-40 to 20 dBu	1:1 to ∞:1	Auto	Auto
dbx	1066	Compressor/limiter/ expander/gate	Exp gate: 0 to 15 dBu; comp: -40 to +20 dBu; lim: 0 to 24 dBu	Expander/gate: 1:1 to 30:1; compressor: 1:1 to ∞:1	Auto or man (0.05 to 100 ms)	Auto or man (0.05 ms to 5 sec)
dbx	DDP	Digital compressor	N/A	1:1 to infinity:1	Auto or manual (0.1-200 ms)	360-5 dB per sec
Demeter	H C-1	Mono tube optical compressor	-30 to 20 dBu	Optical/soft knee 2:1 to 30:1	1 to 200 ms	100 ms to 5 sec
Demeter	VTCL-2b	Stereo tube optical compressor limiter	-30 to 20 dBu	Optical/soft knee 2:1 to 30:1	1 to 200 ms	100 ms to 5 sec
Demeter	VTCL-2bx	Stereo tube optical compressor limiter	-30 to 20 dBu	Optical/soft knee 2:1 to 30:1	1 to 200 ms	100 ms to 5 sec
DOD	SR866	Gated compressor/limiter	-40 to 20 dBu	1:1 to ∞:1	Manual (0.1 to 100 ms)	Manual (50 ms to 2.5 sec)
Drawmer	1960	Dual-channel tube compressor/tube preamp	0 to -24 dB	1.1:1 to 30:1	Man or auto (0.5 to 20 ms)	Man or auto (400 ms to 20 sec)
Drawmer	DL241/DL241XLR	Dual gated compressor/limiter	Comp: -40 to +20 dB; exp/gate: -70 to +20 dB; lim: 0 to 18 dB	1.2:1 to ∞:1	Auto or manual (0.5 to 100 ms)	Auto or manual (0.05 to 5 sec)
Drawmer	DL251	Dual-channel; spectral compressor	Comp: -40 to +20 dB; lim: 0 to 18 dB	1.2:1 to ∞:1	Auto or manual (0.5 to 100 ms)	Auto or manual (0.05 to 5 sec)
Drawmer	DL441	Quad compressor/limiter	Comp: -40 to +20 dB; lim: 0 to 18 dB	1.2:1 to ∞:1	Auto (0.5 to 100 ms)	Auto (0.05 to 4 sec)
Drawmer	DS201	Dual-frequency conscious noise gate	-54 to +20 dB	N/A	Manual (10 µs to 1 sec)	Manual (2 ms to 4 sec)
Drawmer	DS404	Quad noise gate	-70 to +20 dB	N/A	Auto	Combines hold and decay 10 ms to 5 sec
Drawmer	MX30	Dual gated/auto compressor/limiter	Comp: -40 to +20 dB; exp/gate: -70 to +20 dB; lim: 0 to 18 dB	1.2:1 to ∞:1	Auto or man (0.5 to 100 ms)	Auto (0.05 to 4 sec)
Drawmer	MX40	4-channel tuneable gate with peak punch	-60 to +20 dB	N/A	10 µs	10 ms to 4 sec
Drawmer	MX50	Dual-channel de-esser	Auto	Auto	Auto	Auto
Empirical Labs	EL-8 Distressor	Compressor/limiter	Varies with input level	1:1 to ∞:1	Manual (<40 µs to 50 ms)	Manual (0.05 to 3.5 sec)
Focusrite	Penta	Solid state (Class A)	Preset	Preset	Preset	Preset
Focusrite	Platinum 3 ComPounder	Dual mono/comp/ exp/noise/limit	Comp: -24 to +12 dB; lim: 12 to 26 dBu	Variable 1.3:1 to ∞; soft/hard knee switchable	Variable 100 µs to 100 ms	Variable 100 ms to 4 sec
Focusrite	Platinum 4 MixMaster	Multiband compressor/ expander/limiter/equalizer/ stereo imager	Comp: -20 to +10 dB	Variable 1.3:1 to 5:1	Auto	200 ms to 1.6 sec
Focusrite	Red 3	Dual compressor/limiter	Comp: -24 to +12 dB; lim: 0 to 18 dB	Variable 1.5:1 to 10:1	Variable 300 µs to 90 ms	Variable 100 ms to 4 sec
FMR Audio	RNC 1773	Compressor	1	1.1 to 25:1	0.2 to 200 ms	0.05 to 5 sec
Galaxy Audio/ Valley Audio	Valley 401	Microphone processor	-40 to +20 dB	Compression ratio fixed 20:1	Expander attack and gate attack 100 µs; compression attack 1-15 ms	Comp, expand release: program dep, 25 sec/20 dB; gate release: prog dep, 1 sec 20 dB
Geoffrey Daking	Daking Compressor/Limiter	Compressor/limiter	-10 to +10	1:1 to 20:1	250µs - 64ms	5, 1, 1.5, and 4 autos
HHB	Radius 3 Fat Man	Tube compressor/limiter	10 dBu to -20 dBu	1:1.5 to 1:30	Slow 5 ms; fast 0.5 ms	Slow 1.5 sec; fast 0.2 sec
HHB	Radius 30	Compressor/expander/limiter	-20 to +20 dB	1:1.5 to 1:30	0.5 to 20 ms, auto	40 ms to 2 sec, auto
Joemeek	SC-2	Compressor	Varies	4.5:1 to 7:1	Manual (1.5 to 10 ms)	Manual
Joemeek	SC2.2	Photo-optical compression	Varies	2:1 to 10:1	Variable 0.5 and 10 ms	Variable
Klark-Teknik	DN500	Dual compressor/ limiter/expander	Comp: -30 to 20 dB; exp: -40 to 20 dB; lim: 0 to 20 dB	Comp: 1:1 to 50:1; exp: 1:1 to 25:1	Comp: auto or man (50 µs-20 ms); exp: auto or man	Comp: auto/man (60 µs to 2 sec); exp: auto/man (40 ms to 2 sec)
Klark-Teknik	DN504	Quad compressor/limiter	-30 to 20 dBu	1:1 to 50:1	Auto or man (50 µs to 20 ms)	Auto or man (60 ms to 2 sec)
Klark-Teknik	DN514	Quad auto gate	-40 to 20 dBu	N/A	Prog dep, semi-automatic expand auto/man (40 ms to 2 sec)	Man (40 ms to 2 sec) including hold
LA Audio	BCL20	Dual compressor/limiter	-40 to 20 dB	1:1 to 20:1	Peak: (1 to 70 ms); RMS: prog dep	Peak: 100 ms to 3 sec; RMS: prog. dep.
LA Audio	FGC20	Dual split-band compressor and frequency-selective gate	-40 to 20 dB	1:1 to 20:1	Fast = 1 ms; slow = 20 ms	40 ms to 4 sec

GAIN CONTROL	BYPASS SWITCH	# OF CHANNELS / STEREO LINK	METER TYPE	MAIN I/O	SIDECHAIN I/O	DIMENSIONS	SPECIAL FEATURES	PRICE
Output	Yes	2/Yes	LED	XLR; 1/4" TRS	1/4" TRS	1U	Switchable hard knee/OverEasy compression	$230
Output	Yes	4/Yes	LED	XLR; 1/4" TRS	No	1U	Switchable hard knee/OverEasy compression	$750
Output	Yes	2/Yes	LED	XLR; 1/4" TRS	1/4" TRS	1U	Sidechain monitor; OverEasy compression	$600
Input/output	Yes	2/Yes	8-seg LED	1/4"; XLR, AES/EBU	No	19x1.75x5.75		$600
Yes	No	1/Yes	10-seg LED VU/ overload LED	XLR; 1/4" TRS	XLR; 1/4"TRS	19x1.75x13	H series tube hybrid; variable attack/release	$1,149
Yes	No	2/Yes	Overload/10-seg LED VU; 10-seg LED change	XLR; TT; 1/4"	No	19x3.5x12	All tube; adjustable input sensitivity	$2,499
Yes	No	2/Yes	Overload/10-seg LED VU; 10-seg LED change	XLR; TT; 1/4"	No	19x3.5x12	Jensen transformers; all tube; variable attack/release	$2,949
Input/output	Yes	2/Yes	LED	1/4" TRS; RCA	1/4"	19x1.75x9	Soft knee	$280
Input/output	Yes	2/Yes	VU meter each channel	XLR	Yes	19x3.5x7	Tube comp with tube-based VCA; instrument preamp with EQ and variable gain	$2,575
Input/output	Yes	2/Yes	8-seg LED	1/4"; (DL241); XLR (DL241XLR)	No	19x1.75x7	Program adaptive expander/gate; peak limiter auto/manual attack/release	$725–$775
Input/output	Yes	2/Yes	10-seg LED out; 9-seg GR LED	XLR	1/4" TRS	19x1.75x7	Variable dynamic spectral enhancement; hi-frequency dynamic expansion and compression; 0 response time peak limiter	$1,100
Input/output	Yes	4/Yes	5-seg output LED; 8-seg gain reduction LED	XLR	No	19x1.75x7	0 response time peak limiter; variable hard/soft knee	$1,200
No	Yes	2/Yes	3-seg LED	XLR	1/4" key input	19x1.75x7	Frequency-sensitive gating with high-/low-pass filters; hold and decay controls; key-listen ducker	$750
No	Yes	4/Yes	3-seg LED per channel	XLR	1/4" key input	19x1.75x7	Frequency-sensitive gating with high-/low-pass filters; hard/soft gate (downward expansion); 20/-90 range switch	$1,125
Output	Yes	2/Yes	8-seg LED comp out; 9-seg GR LED; 2-seg LED gate on/off	XLR; 1/4"	No	19x1.75x7	Program-adaptive expander/gate; 0 response time peak limiter	$500
No	Yes	4/Yes	3-seg LED	XLR	1/4" key input	19x1.75x7	Trigger stabilization; peak punch	$725
De-ess frequency	Yes	2/Yes	9-LED each channel	XLR	No	19x1.75x8	-20 dB split/full band de-essing	$600
Input/output	Yes	2/Yes	LED	XLR; 1/4"	1/4"	19x1.75x10	Emulates classic compressors (LA2, LN1176, others)	$1,499-$3,299
Yes	Yes	2/No	LED	1/4" TRS	Yes	19x3.5x6	Warmth and image width controls; 16 presets	
Yes	Yes	2/Yes	LED	XLR; 1/4" TRS	1/4"	1U	Class A amplifier design; inductor-powered bass expander; switchable 4 dBu and -10 dBV operation	$775
Yes	Yes	2/Yes	LED	XLR; 1/4"; optional AES/EBU and S/PDIF digital output	No	2U	3-band stereo EQ; optional 24-bit/96K digital output	$1,395 and up
Output	Yes	2/Yes	VU	Transformer-balanced; XLR	Key inputs XLR	2U	Stereo switch; auto-release mode	$3,295
Yes	Yes	2/Yes	8-seg LED	1/4" TRS	1/4"; TRS	5.5x5.5x1.6	Super Nice mode	$200
Output	No	1/No	LED; VU; attenuation	XLR	1/4" TRS	19x1.75x9.6	Clip indicator for preamp/EQ/VCA; phantom power	$680
Yes	Yes	1/Yes	VU	XLR	XLR; 1/4"	19x1.75	All discrete with FET gain change	$1,595
Input/output	Yes	2/Yes	VU	1/4"	No	8.4x5.2x8.3	15 presets; manual mode	$469
Gain make-up/output	Yes	2/No	VU	XLR; 1/4"	1/4" TRS	19x7.9x3.5	VU switchable between output and GR	$749
Input/output	Yes	2/Yes	VU	XLR; 1/4" TRS	No	19x3.5	Vintage photo-optical compressor sound	$1,299
Input	Yes	2/Yes	VU	XLR	No	2U	Dark switch for thicker sound	$800
Yes	Yes	2/Yes	LED	XLR	1/4" TRS	19x1.75x11.5	Variable knee; VCA design; vari-ratio expander	$1,425
Yes	Yes	4/Yes	LED	XLR	1/4" TRS	19x1.75x11.5	Switchable hard or soft knee compression	$1,495
No	Yes	1/No	LED	XLR	1/4"	19x1.75x11.5	Syncs audio tracks by interlocking gate release times	$1,215
Yes	Yes	2/Yes	12-seg LED	XLR	No	19x7.5x1.75	RMS/peak detection mix feature; broadcast specs; transformer balanced outs	$1,200
Yes	Yes	2/Yes	2x8-seg LED	XLR	No	19x7.5x1.75	Frequency windowing filters in gate/sidechain/audio path	$1,000

SEE PAGE 174 FOR A COMPLETE LISTING OF MANUFACTURERS' CONTACT INFORMATION

DYNAMICS PROCESSORS

MANUFACTURER	MODEL	TYPE	THRESHOLD	RATIO	ATTACK TIMES	RELEASE TIMES
LA Audio	GCX20	Dual compressor/gate	-50 to 20 dB	1:1 to 20:1	Prog dep: 5 to 70 ms (fast), up to 3 sec (slow)	Prog dep: up to 1 sec (fast) and up to 3 sec (slow)
LA Audio	TCX20	Dual compressor/gate	-30 to 20 dB	1:1 to 20:1	Auto or man (0.1 to 100 ms)	Auto or man (0.04 to 4 sec)
Langevin	Langevin Stereo ELOP	Stereo limiter	22 dB	10:1	10 ms or 6 dB	2.5 ms or 6 dB
Manley Labs	Manley Stereo ELOP	Stereo electrical-optical limiter	22 dB	10:1	10 ms for 6 dB GR	2.5 seconds for 6 dB GR
Manley Labs	SLAM!	Stereo mic pre and compressor	Variable	10:1	FET 100 uSec; ELOP 10 ms	FET 10 ms to 2 sec; ELOP 2.5 sec
Manley Labs	Stereo Variable Mu	Compressor/limiter	Variable	Comp 1.5:1; lim 4:1 to 20:1	25 to 70 ms	0.2 to 8 sec
Oram Pro	Sonicomp 1	Solid state compressor	Yes	Yes	Yes	Yes
Oram Pro	Sonicomp 2	Solid state compressor	Yes	Yes	Yes	Yes
Pendulum	6386	Variable-mu tube limiter	Off to -20	1:1 to limiting	0.1 to 100 mS	50 ms to 2 sec
Pendulum	ES-8	Variable-mu tube limiter	Off to -20	1:1 to limiting	0.1 to 100 mS	50 ms to 2 sec
Pendulum	OCL-2	Compressor/limiter	Off to -20 dB	1.5:1 to 15:1	1 to 50 ms	50 ms to 20 sec
Phonic Hi-Tech	PCL3200	Compressor/limiter/gate	-40 to 20 dB	1:1 to 10:1	Manual (0.1 to 200 ms)	Manual (50 ms to 3 sec)
PreSonus	ACP-22	Stereo compressor/ limiter/ spectral gate	-70 to 20 dB	1:1 to 20:1	Auto or man (comp: 0.1 to 100 ms, gate: 10 µs to 100 ms)	Auto or man (0.02 ms to 2 sec)
PreSonus	ACP-88	Compressor/limiter/gate	-0 to 20 dBu	1:1 to 20:1	Auto or man (0.01 to 100 ms)	Auto or man (0.02 ms to 2 sec)
PreSonus	Blue Max	Smart compressor/ limiter	Fixed (-10 dB) manual mode	1:1 to 20:1	Manual (0.01 to 100 ms)	Manual (10 to 500 ms)
PreSonus	CL44	Quad compressor/limiter	+15 dBu to -40 dBu	1:1 to 20:1	Auto or manual (1 ms to 500 ms)	Auto or manual (1 sec to 3 sec)
PreSonus	GTX44	Quad gate/expander	+15 to -40	1:1 to gate	1 ms-500 ms	15 ms to 25 ms
Rolls	CL 151 GLC	Comp/limiter w/mic preamp	-30 to 10 dB	1:1 to ∞:1	Auto	Auto
Rane	DC 22 Dynamic Controller	Compressor/gate	-40 to +20 dB	1:1 to ∞:1	Auto	Auto
Rane	DC24	Compressor/limiter/expander/ gate 2-way crossover	-50 to 20 dB	1:1 to 20:1	Auto	Auto
Requisite Audio	PAL Plus	Tube mic pre/compressor/limiter	-30 dB	3:1; 10:1	10 µsec (instant)	0.06 for 50% release; 0.5 to 5 sec complete release
Rolls	RP252	Compressor/limiter/gate	-40 to 12 dB	1:1 to ∞:1	Man (0.2 to 10 ms)	Man (40 ms to 2 sec)
Samsom	S Com	Stereo compressor	-40 to 20 dB	1:1 to ∞:1	Variable (0.3 ms/20 dB to 300 ms/20 dB)	Auto or (0.5 to 3 sec)
Samsom	S Com 4	4-ch compressor/gate	-40 to 20 dB	1:1 to ∞:1	Variable (0.3 ms/20 dB to 300 ms/20 dB)	Auto or (0.5 to 3 sec)
Samsom	S Com Plus	Expander/gate compressor/ limiter de-esser	-40 to 20 dB	1:1 to ∞:1	Variable (0.3 ms/20 dB to 300 ms/20 dB)	Auto or (0.5 to 3 sec)
Sony	SRP-F300	Digital speaker system multi-processor	N/A	N/A	N/A	N/A
SPL Electronics	Auto-Dynamic De-Esser	De-Esser	Auto	Variable	Auto	Auto
SPL Electronics	Dynamaxx	Compressor/limiter/gate	Variable	Variable	Auto	Auto
SPL Electronics	Kultube	Compressor/limiter	-55 dBu to +23 dBu	1:1 to ∞:1	Auto or manual (20 µs to 0.95 sec)	Auto or manual (30 ms to 2 sec)
SPL Electronics	Transient Designer 2	Audio envelope design	N/A	N/A	Auto	Auto
SPL Electronics	Transient Designer 4	Audio envelope design	N/A	N/A	Auto	Auto
Summit Audio	DCL-200	Dual compressor/limiter	N/A	1.1:1 to 7:1	Variable; 0.1ms to 100 ms	Variable; 45 ms to 10 sec
Summit Audio	TLA-50	Compressor/limiter/gate	-25 to 25 dBu	1:1 to 4:1	Sel (fast, medium, slow)	Sel (fast, medium, slow)
Summit Audio	TLA-100A Tube Leveling Amplifier	Tube compressor	-25 to 25 dBu	1:1 to 4:1	Sel (fast, medium, slow)	Sel (fast, medium, slow)
TC Electronic	Finalizer Express	Compressor	-25 to 0 dBu	1:1 to ∞:1	0.3 to100 ms/band	20 ms to 7 sec/band
TC Electronic	Triple C Mono/Triple C Stereo	Compressor	-40 dB	1:1 to ∞:1	0.2 to 50 ms	20 to 2,000 ms
TL Audio	Classic C-1	Tube compressor	20 to 20 dB	Variable 1:1.5 to 1:30	Variable 0.5 to 50 ms	Variable 40 ms to 4 sec
Tube Tech	CL-1B	Tube compressor	20 to -40 dBm	2:1 to ∞:1	Fixed or continuously variable	Fixed or continuously variable
Tube Tech	CL-2A	Tube compressor	20 to -40 dBm	2:1 to ∞:1	Fixed or continuously variable	Fixed or continuously variable
Tube Tech	LCA-2B	Stereo compressor/limiter	Off to -10 dBu	1.6:1 to 20:1	0.3 to 70 ms	0.07 to 2 sec
Tube Tech	MEC-1A	Mic preamp/EQ/compressor	-20 dB to off	1.5:1 to 10:1	0.3 to 70 ms	60 ms to 2 sec
Tube Tech	SMC-2A	Stereo multiband compressor	Variable	1.6:1 to 20:1	0.3 to 70 ms	0.07 to 2 sec
Universal Audio	1176LN	Limiting amp	Set by input level control	4:1 to 20:1	20 to 800 ms	50 ms to 1.1 sec
Voce	EVC-1	Tube compressor	0 to 20 dBu	1:1 to 10:1	Man (1 to 1000 ms)	Man (1 to 1,000 ms)
Waves	L2 Ultramaximizer	Limiter	0 to -30.0 dBFS	Limiter	N/A	0.1 ms to 1,000 ms

GAIN CONTROL	BYPASS SWITCH	# OF CHANNELS / STEREO LINK	METER TYPE	MAIN I/O	SIDECHAIN I/O	DIMENSIONS	SPECIAL FEATURES	PRICE
Yes	Yes	2/Yes	2x6-seg LED	XLR, 1/4" TRS	No	19x61.75		$300
Yes	Yes	2/Yes	2x6-seg LED	XLR; 1/4" TRS	No	19x6x1.75		$500
Output/gain reduction	Yes	2/Yes	VU and gain reduction modes	XLR, 1/4" TRS	No	19x1.75x10	All discrete	$1,775
Threshold/output	Yes	2/Yes	VU &GR	XLR; 1/4" TRS	No	19x3.5x10	LA-2A style, all tube	$2,500
Input; output	Yes	2/Yes	VU; 26-seg multicolor LED	XLR; 1/4"; AES/EBU	Bantam TT patchbay	19x3.5x10	24/192 A/D, DACs outboard PSU	$3,500
Yes	Yes	2/Yes	Analog	XLR	RCA (option)	19x3.5x10	All tube fully differential	$4,000
Yes	Yes	2/Yes	LED: GR/input	XLR; 1/4"	Yes	1U	Switchable light-dependent resistor	$1,995
Yes	Yes	2/Yes	VU: GR/input	XLR; 1/4"	Yes	2U	Solid state or light-dependent resistor	$2,590
Yes	Yes	2/Yes	VU	XLR; 1/4"	1/4" TRS	19x3.5x12.5		$3,495
Output	Yes	2/Yes	VU	XLR; 1/4"	1/4" TRS	19x3.5x12.5		$3,995
Output	Yes	2/Yes	VU	XLR; 1/4"	1/4" TRS	19x3.5x12.5	All tube gain path; transformerless design	$2,795
Output	Yes	2/Yes	LED	1/4"	1/4"	19x2x4.5	Hard/soft knee; peak RMS switch	$249
Output	Yes	2/Yes	8-seg LED	XLR; 1/4"	1/4" TRS	19x1.75x5	Hard/soft knee; freq-dependent LP gate filter	$400
Output	Yes	8/Yes	LED	1/4" TRS	1/4" TRS	19x3.5x6	Hard/soft knee; accepts +4/-10 dBu inputs	$1,200
Input/output	Yes	2/Yes	LED	1/4" TRS	1/4" TRS	19x1.75x8	Includes 15 inst-specific preset comp. curves	$200
Output	Yes	2/Yes	10-seg LED	XLR; 1/4" TRS	1/4" TRS	19x1.75x7	Lo filter; optical compressor emulation	$699
No	Yes	2/Yes	10-seg LED	XLR; 1/4" TRS	1/4" TRS	19x1.75x7	Frequency-controlled gating/expansion/ducking	$699
Input/output	No	1/No	LED	XLR; 1/4"	1/4" TRS	4.15x2.46x1.55	Mic preamp, 40 dB total gain	$120
Output	Yes	2/Yes	4-seg LED	XLR; 1/4" TRS	No	19x1.75x5.3	Adjustable gate/downward expander	$349
Output	Yes	2/Yes	LED	XLR; 1/4" TRS	1/4" TRS	19x1.75x5.3	Combine crossover mode; -10/+4 dBu inputs	$599
Output	No	1/Yes	VU for gain reduction	XLR	No	2U		$2,500
Output	Yes	2/Yes	10-seg LED	XLR; 1/4"	1/4"	19x1.75x6		$275
Output variable (-20 to 20 dB)	Yes	2/Yes	12-seg LED	XLR; 1/4" TRS	1/4"	1.75x19x7.75	Full featured, dual-channel dynamics processor incl comp/lim, expander/gate, de-esser, peak limiter	$220
Output variable (-20 to 20 dB)	Yes	4/Yes	5-seg LED	XLR; 1/4" TRS	1/4"	1.75x19x7.75	Full featured, 4-ch dynamics processor incl comp/lim and expander/gate on each channel	$290
Output variable (-20 to 20 dB)	Yes	2/Yes	12-seg LED	XLR; 1/4" TRS	1/4"	1.75x19x7.75	Full featured, dual-channel dynamics processor incl comp/lim, expander/gate de-esser, peak limiter	$280
No	No	No	Peak-reading LED (x8)	XLR; AES/EBU	No	19 x1.75x14.5	PC-controlled multi-processing with included software	$1,875
No	Yes	2/No	LED	XLR; 1/4"	No	19x1.75x9.33		$699
Yes	Yes	2/Yes	LED	XLR; 1/4"	1/4" TRS	19x1.75x9.33	Soft knee; de-compressor	$799
Yes	Yes	2/Yes	VU	XLR; 1/4" TRS	1/4" TRS	19x1.75x8.27	Hard and soft knees; de-compression; master/slave link for connecting multiple units.	$1,699
No	Yes	2/Yes	N/A	1/4"	No	19x1.75x8.27	Attack and sustain controls for envelope design	$599
No	Yes	2/Yes	N/A	XLR	No	19x1.75x8.27	Attack and sustain controls for envelope design	$1,199
Yes	Yes	2/Yes	True VU for level and gain reduction	XLR	1/4" TRS	19x10.5x3.38	Vacuum tube/solid state hybrid	$3,490
Yes	Yes	1/Yes	VU	XLR; 1/4"	1/4" TRS	9.5x1.75 (1/2 rack)	Auto level switching (+4, -10) tube	$695
Output	Yes	1/Yes	VU for output/GR	XLR	1/4" TRS	19x3.5x10.5	Soft knee; Jensen 990 output; transformerless	$2,150
Input/output	Yes	2/Yes	LED	S/PDIF; AES/EBU; Toslink	No	1U	24-bit AD/DA; soft clip; spectral balance	$1,599
Output	Yes	1/2/Yes	36-seg LED	1/4"; S/PDIF; 1/4" TRS in stereo	1/4" TRS	19x8.2x1.75	MIDI; envelope compression	$699/$999
Yes	Yes	2/Yes	VU	XLR; 1/4"TRS	TRS	19x3.5x10	Onboard mic preamps and direct inputs	$1,795
Yes	Yes	1/No	VU	XLR	XLR	3U		$2,195
Yes	Yes	1/No	VU	XLR	XLR	3U	2 channel version of CL-1B	$3,295
Yes	Yes	1/Yes	LED	XLR	XLR	2U	Fairchild 670 attack/release presets	$3,495
Yes	Yes	2/Yes	VU	XLR; 1/4"	No	2U	Gold-plated switches	$3,995
Yes	Yes	2/Yes	LED	XLR	XLR	2U		$4,395
Output	No	1/Yes	VU	XLR; barrier strip	No	2U	True replica	$1,895
Output	Yes	1/No	LED	XLR; 1/4" TRS	1/4" TRS	8x1.6x8.5	Soft knee; no solidstate devices in audio path	$799
Yes	Yes	2/Yes	peak LED ladders	(2) XLR; (2) 1/4" TRS; AES/EBU; S/PDIF	Yes	2U	24-bit AD and DA converters; x2 function for doubling sample rates (88.2/96 kHz), choice of sync to ext clock (BNC), digital input, or internal; re-quantizer output 24, 22, 20, 18, and 16-bits	$2,395

SEE PAGE 174 FOR A COMPLETE LISTING OF MANUFACTURERS' CONTACT INFORMATION

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PreSonus Audio Electronics

digimax LT

The DigiMAX LT is essential to the modern digital studio. Eight channels of pristine mic preamplification, inserts on every channel, and an internal power supply set this unit apart from anything on the market. Each channel features our award-winning, high performance, dual servo microphone preamplifiers with 48V phantom power, and -20dB pad. Each channel features a Neutrik® connector that accepts line level or microphone input. DigiMAX LT digital synchronization is achieved by offering word clock in and out via BNC connectors. The sample rate can be set on the front panel to 48K, 44.1K, and 32K providing compatibility across multiple platforms.

The DigiMAX LT provides TRS inserts on every channel to allow external dynamics processors or equalizers to be placed in the signal chain. The DigiMAX LT is the perfect partner for recording systems such as DigiDesign 001®, MOTU 2408® as well as numerous digital mixers and hard disk recorders.

Lowest Price Ever!

GREAT FEATURES!!!

- ADAT™ Lightpipe Output
- Eight Dual Servo Mic Preamps and line inputs
- Eight TRS insert Points
- Linear Internal Power Supply
- 48V Phantom Power on Each Channel
- -20 dB Pad on Each Channel
- Adjustable Sample Rates
- BNC I/O for Sync

HOT!

Firestation

The FireStation is a computer recording interface that provides connection to the recording software environment via a high speed FireWire® connection. FireWire®, the ultimate recording media network, solves the problem of having to use an internal recording interface sound card or large cable connecting to a recording interface. The benefits of FireWire® and the IEEE1394 standard are many, including: hundreds of channels of digital audio and midi on one network, easy connection of additional interfaces between products, master clock control bus that precludes the need for word clock distribution. The FireStation will be compatible with many software packages on both Mac and PC platforms.

- High-Speed FireWire® Interface
- Two Dual-Servo Preamplifiers with Switchable Tube Circuit
- Two 1/4" Instrument Preamps
- 48V Phantom Power with -10dB Pad
- Balanced Preamp Sends via 1/4" TRS Connectors
- Ten-Channel Analog Mixer
- MIDI I/O
- Eight Channels of Analog I/O
- Eight Channels of ADAT® I/O
- S/PDIF I/O
- Control Room and Headphone Outputs with Separate Volume Controls
- External Recording Punch Input
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- Dual Servo Microphone Preamplifier Front End with Tube Line Drive Amplifiers.
- 20dB Pad.
- 48V Phantom.
- Phase Reverse.
- Eight Segment Level meter.
- 12AX7 Low Noise Tubes.
- Warm, Silky Contours.
- Fits perfectly in the PreSonus BMRA rack adapter with the PreSonus BlueMax.
- Output section includes XLR and 1/4" connectors for driving two separate signal paths.
- 1/4", high Z input on the front panel for instrument preamplification.
- The BlueTUBE is housed in a half rack space steel chassis with a high quality, anodized aluminum front panel.

Award Winner

DigiTube

Born from the award winning BlueTUBE, the DigiTUBE adds a three band sweepable EQ and 24bit Digital Output. The mic preamp features 70dB of gain with 22dB of Headroom. The DigiTUBE provides a three band EQ which is fully sweepable with overlapping bands for maximum tone shaping. A 24Bit Digital output via S/PDIF makes the Digitube the perfect front end for soundcards and digital recorders. The DigiTUBE offers XLR analog output and TRS Insert point for patching in a compressor or other outboard effect unit.

- Tube preamp with 70dB of Gain and 22dB of Headroom
- Fully sweepable 3 Band EQ with bypass switch
- Insert point after Mic Preamp for patching in a compressor/limiter or other outboard device
- 24Bit Digital Output via S/PDIF
- Word clock input and output via BNC Connectors
- Rackmountable via optional BMRA Rack Adaptor

MP20

- Class-A Discrete, Dual Servo Microphone Preamplifier.
- 20dB Pad.
- 48V Phantom.
- 80Hz Roll-off Filter.
- Polarity Reverse.
- IDSS control. Creates vintage warmth by adjusting even harmonic distortion.
- 12 Segment Level meter.
- High Output Headphone Amplifier.
- Identical technical specifications as the M80.
- Low impedance stereo mix bus can be used for full control over stereo imaging.
- Fully loaded back panel featuring XLR balanced input/output connectors as well as separate send and return jacks for inserting dynamics processors (such as The PreSonus ACP-22).
- 1/4", high Z input on the front panel for instrument preamplification.
- Mix output connectors are XLR balanced providing connectivity for professional recording systems.
- The MP20 is housed in a single rack space steel chassis with a thick, high quality, blue anodized front panel.

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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	AirFX	50/0	N/A	Vocodors, flangers, phasers, panners	1	No	Y/Y	N/A	N/A	No	No
Alesis	Akira	50/50	N/A	Reverb, delay, pitch, filter	3	Yes	Y/Y	700 ms	+/- 1 octave	Yes	Yes
Alesis	Ineko	48/0	N/A	revb, dly, phasers, flng, voco, tape em	1	Yes	Y/Y	N/A	N/A	No	No
Alesis	MicroVerb 4	100/100	N/A	Rvrb, chrs, dly, flng, rtry, ptch	3	Yes	N/Y	1,300 ms	±1 octave	Yes	2
Alesis	MidiVerb 4	128/128	N/A	Rvrb, chrs, dly, flng, rtry, ptch	3	Yes	Y/Y	1,300 ms	±1 octave	Yes	2
Alesis	NanoVerb	16/0	N/A	Rvrb, chrs, dly, flng, rtry	3	Yes	N/Y	1,300 ms	N/A	No	No
Analogue Solutions	Filtered Coffee	N/A	Filter	N/A	3	No	Y/Y	N/A	N/A	No	No
Antares	AMM-1 Microphone Modeler	100/100	N/A	Models the sonic characteristics of various microphones	2	No	Y/Y	N/A	N/A	Yes	Yes
Antares	ATR-1A Auto-Tune	50/20	N/A	Real-time pitch correction	1	No	Y/Y	N/A	±1 octave	Yes	Yes
A.R.T.	DMV-Pro	100/100	N/A	Rvrb, chrs, flng, ptch, trml, rtry, phsr, pan, dly	4	Yes	Y/Y	5 sec	>2 octaves	Yes	16
A.R.T.	FX-1	60/0	N/A	Rvrb, chrs, dly, flng, ptch, trml, pan, gate	3	No	N/Y	420 ms	1 octave	No	No
Behringer	Modulizer Pro DSP1224P	N/A	N/A	24 effect types, 100 programs	1	Yes	Y/Y	N/A	N/A	Yes	13
Behringer	Virtualizer Pro DSP1024P	N/A	N/A	32 effect types, 700 variations, 100 programs	2	Yes	Y/Y	5 sec	±12 semi-tones	Yes	11
Boss	GT-3 Guitar Effects Processor	340 (200/140)	11	21	13	Yes	Y/Y	1.8 sec	± 2 octaves	Yes	No
Boss	VF-1	200/200	N/A	Multi	9	Yes	Y/Y	2800 ms	+/- 2 octaves	Yes	Yes
Carvin	XP 2	100/100	N/A	Choruses, flangers, phasers, echoes, delays, rotary speakers	2	Yes	Y/Y	2 sec/eng	N/A	Yes	Yes
Carvin	XP 4	100/100	N/A	Reverbs, choruses, flangers, phasers, echoes, delays, rotary speakers	4	Yes	Y/Y	4 sec/eng	N/A	Yes	Yes
Crate	SM1-SP	32/0	N/A	Reverb, delay, flange, chorus, gated reverb, rotary	2	No	N/N	455 ms	N/A	No	No
Crate	SM2-SRS	2/0	N/A	N/A	1	No	Y/Y	N/A	N/A	No	No
DACS	FWS Series FREQue II	N/A	Ring mod; oscillator; frequency mod	N/A	3	Yes	N/N	N/A	N/A	No	No
DACS	Vocoder	N/A	Vocoding filter	N/A	4	Yes	N/N	N/N	+/- 1 octave	Yes	No
dbx	480 DriveRack	10/10	N/A	Delay, compressor/limiter, EQs, notch filters, RTA	1	No	N/N	600 ms	N/A	Yes	No
dbx	481 DriveRack	10/10	N/A	Delay, compressor/limiter, EQ, crossovers, RTA	1	No	N/N	N/A	N/A	Yes	No
dbx	482 DriveRack	10/10	N/A	Delay, compressor/limiter, crossovers, EQs, notch filters, RTA	1	No	N/N	600 ms	N/A	Yes	No
Demeter	Real Reverb	N/A	Stereo spring reverb	N/A	3	Yes	N/Y	3.5 sec	N/A	No	No
DigiTech	Genesis I	N/A	N/A	7	7	No	N/N	N/A	N/A	No	No
DigiTech	Genesis 3	48/48	N/A	31	11	No	Y/Y	N/A	N/A	Yes	Yes
DigiTech	GNX 2	64/64	N/A	31	13	No	Y/Y	N/A	N/A	Yes	Yes
DigiTech	GNX2/GNX3	64/64	N/A	31	13	No	Y/Y	N/A	N/A	Yes	Yes
DigiTech	GNX 3	64/64	N/A	31	13	No	Y/Y	N/A	N/A	Yes	Yes
DigiTech	StudioQuad 4	100/100	N/A	57	4	Yes	N/Y	5 sec	±2 octaves	Yes	8
DigiTech	Studio S-100	99/99	N/A	25	2	Yes	N/Y	2 sec	-1 octave/+2 octaves	Yes	1
DigiTech	Studio S-200	99/99	N/A	25	2	Yes	N/Y	2 sec	-1 octave/+2 octaves	Yes	15
DOD	D-12 Stereo Delay/ Sampler	N/A	N/A	Sample delay, chorus, flanger	4	Yes	N/N	Up to 24 sec smpling	N/A	No	No
DOD	Dimension 3	N/A	N/A	Dly, rvrb, chrs, flng, phs, ptch, trml, rtry, pan	2	No	N/N	370 ms	±1 octave	No	No
Eventide	Eclipse	Over 200 (70-80 factory algorithms)/ unlim via PCMCIA SRAM cards	N/A	Dozens	2	Yes	Y/Y	20 sec in mono at 44.1 kHz (10 sec in stereo)	±4 octaves (chromatic mode); ±2 octaves (Diatonic mode)	Yes	Yes
Fostex	DE-1	121	N/A	Yes	2	Yes	N/N	N/A	N/A	No	No

DISCRETE PROCESSING CHANNELS	ADC/DAC	OVERLOAD WARNING	INPUTS	OUTPUTS	POWER SUPPLY	SPECIAL FEATURES	PRICE
2	24-bit/24-bit	N/A	Stereo RCA -10 dBV	Stereo RCA -10 dBV	Alesis P3	Axyz infrared controller	$249
2	24-bit/24-bit	3-segment LED; clip light	(2) 1/4" TRS	(2) 1/4" TRS	50-60 Hz, 100-230 VAC	3 real-time parameter controls per program	$299
2	24-bit/24-bit	Signal/clip LED	(2) 1/4"	(2) 1/4"	Alesis P3		$199
2	18-bit/18-bit	4-seg LED	(2) 1/4"	(2) 1/4"	Alesis P3 adapter	Bypass/tap-tempo footswitch; 2 parameter knobs	$249
2	18-bit/18-bit	18-seg LED; clip light	(2) 1/4"	(2) 1/4"	Alesis P3 adapter	Auto level sensing; tap tempo footswitch	$299
1	18-bit/18-bit	Clip light	(2) 1/4"	(2) 1/4"	Alesis P3 adapter	Adjust knob; bypass footswitch	$135
1	N/A	N/A	(3) 1/4"	(4) 1/4"	15VAC, 500 mA	Pure analog; based on Korg MS20 analog synth.	$325
1	20 bit/24 bit	5-seg LED AES/EBU	1/4"; XLR; AES/EBU	1/4"; XLR	External	Models tube saturation; downloadable models	$995
1	20-bit/24-bit	6-seg LED	1/4" TRS; XLR	1/4"; XLR	External	Speed control; learn scale from MIDI; tracks down to 25 Hz set note via MIDI	$549
4	20-bit	5-seg LED	(4) 1/4"	(4) 1/4"	External	Twin LCD editing interfaces	$525
2	16-bit/16-bit	Clip light	(2) 1/4"	(2) 1/4"	External		$139
2	20-bit/20-bit	N/A	1/4" TRS; XLR	1/4" TRS; XLR	Internal	Software for remote control via PC	$109
2	20-bit/18-bit	N/A	1/4" TRS; XLR	1/4" TRS; XLR	Internal	Software for remote control via PC; 24-bit dual engine multieffects	$159
1	4-bit/20-bit	LED	1/4"; 1/8" aux	(2) 1/4"; 1/8" phones	External 14V	Unique FX: auto-riff, slicer, etc., 10 simul real-time parameter control with built-in exp and control pedals; 14 COSM mod amps; all metal with modeled mics & mic placement	$495
2	24-bit	LED	(2) 1/4"	(2) 1/4"	AC adaper	S/PDIF digital output	$595
2	24-bit/24-bit	N/A	2	2	N/A		$200
4	24-bit/24-bit	N/A	4	4	N/A		$300
2	1-bit/16-bit/64x	Signal/peak LED	(2) 1/4"	(2) 1/4"	External	Includes 32 presets	$180
2	N/A	Signal/peak LED	(2) 1/4"	(2) 1/4"	External	Creates 3D surround from 2 speakers	$130
2	N/A	LED	1/4" TRS	1/4" TRS	AC		$1,400
2	N/A	N/A	(2) 1/4" TRS; XLR	(2) 1/4" TRS	50-60 Hz, 90-250 VAC	Deep freeze	$1,500
1	N/A	N/A	(4) XLR	(8) XLR	Internal	GUI interface; optional remote controller	$3,000
1	N/A	N/A	(4) euroblock connectors	(8) euroblock connectors	Internal	GUI interface; optional remote controller	$2,400
1	N/A	N/A	(4) XLR	(8) XLR	Internal	GUI interface; optional remote controller	$2,500
2	N/A	LED	1/4" TRS and 3-pin balanced inputs	1/4" TRS and 3 pin balanced outputs	Internal	Physical spring reverberation long or short decay times; low cut filter; phase switch; gain and mix controls; stereo or mono operation	$700
2	24-bit	N/A	1/4" guitar	(2) 1/4"	9 VAC		$150
2	24-bit	N/A	1/4" guitar; 1/8" CD jam along	(2) 1/4" TRS	9 VAC		$450
2	24-bit	N/A	1/4" guitar	1/4"; headphone	9 VAC		$580
2	24-bit	N/A	1/4"	S/PDIF; (2) 1/4"	9 VAC included	8-track recorder	$580/$720
2	24-bit	N/A	1/4" guitar	1/4"; headphone	9 VAC	8-track recorder	$720
4	20-bit	Clip (each input)	(4) 1/4"	(4) 1/4")	AC	Programmable signal routing; LFOs; dynamic filters	$480
2	20-bit	Clip LED	(2) 1/4"	(2) 1/4"	AC	User-selectable effects/signal routing configurations	$220
2	20-bit	Clip LED	(2) 1/4"	(2) 1/4"	Internal	User-selectable configurations; large display	$340
4	16-bit/16-bit	Clip LED	2	2	External	Reverse playback, jog/shuttle wheel 24-second sampler	$300
2	18-bit/16-bit	Clip LED	(2) 1/4"	(2) 1/4"	External	Noise reduction with gate threshold	$170
2	24-bit	7-seg LED	Analog: 1/4"; XLR; digital AES/EBU; S/PDIF	Analog: XLR; digital: AES/EBU; S/PDIF	AC	24-bit/96 kHz processing; word clock; ADAT lightpipe	$2,995
2	20-bit	Peak LEDs	(2) 1/4"	(2) 1/4"	DC9V (exclusive AC adapter)	Half rackspace; rotary controls	$199

SEE PAGE 174 FOR A COMPLETE LISTING OF MANUFACTURERS' CONTACT INFORMATION

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
Fostex	DE-10	121	N/A	Reverbs	2	Yes	N/N	N/A	N/A	No	No
Korg	Ax100G	40/40	N/A	63	7	No	N/Y	2 sec	±24	No	No
Kurzweil	KSP8	636/999	N/A	Reverb, delay, chorus, flange, phaser, enhancer, filter, distortion, comp, lim, expander, gate, ring mod, cabinet sim, spatializer, rotary speaker emulation, trmolo, EQ, others	16	Yes	Y/Y	21.5 sec	N/A	Yes	Yes
Lexicon	MPX 1	200/50	N/A	56 pitch, chorus, EQ, modulation, delay, and reverb effects	6	Yes	Y/Y	2 sec	2 octaves per voice (2 voices)	Yes	24
Lexicon	MPX 110	240/16	N/A	Reverb; delay; chorus; pitch; detune; flange; rotary; tremolo; echo	2	Yes	Y/Y	5.5 sec	+1, -2 octaves	Yes	Yes
Lexicon	MPX 200	240/64	N/A	Comp; reverb; delay; chorus, detune; flange; rotary; tremolo; echo	3	Yes	Y/Y	5.5 sec	+1, -2 octaves	Yes	Yes
Lexicon	MPX 500	240/30	N/A	Reverb, tremolo, rotary, chorus, flange,detune, pitch, delay, echo, dual algorithms	2	Yes	Y/Y	5.5 sec	2 octaves	Yes	24
Lexicon	MPX G2	200/50	6 analog distortion effects	68 pitch, EQ, gain, reverb, delay, JamMan, phase, filter, compression	7	Yes	Y/Y	20 sec	2 octaves	Yes	24
Lexicon	PCM 81	300/50	N/A	Reverb; delay; pitch shift; EQ; pitch correct	3	Yes	Y/Y	20 sec	+/-5 octaves	Yes	Yes
Lexicon	PCM 91	450/100	N/A	Reverb; delay	2	Yes	Y/Y	1,250 ms	N/A	Yes	Yes
Line 6	Bass POD	36/36	N/A	16 bass amp models; 16 effects (incl. envelope follower, octave, down, phaser, chorus, bass synth, compressor); 15 cabinet models	3	Yes	Y/Y	N/A	N/A	Yes	Yes
Line 6	Bass POD Pro	36/36	N/A	16 bass amp models; 16 effects (incl.Envelope follower, octave down, phaser, flanger, chorus, bass synth, compressor, noise gate, Wah); 15 cabinet models	3	Yes	Y/Y	N/A	N/A	Yes	Yes
Line 6	DL4-Delay Modeler	15/3	Digital modeling of 15 vintage delay and echo effects	N/A	1	Yes	N/Y	2.5 sec	N/A	No	No
Line 6	DM4-Distortion Modeler	16/4	Digital modeling of 16 vintage distortion effects	N/A	1	No	N/Y	N/A	N/A	No	No
Line 6	Echo Pro	99	N/A	Echo; delay	1	Yes	Y/Y	2.576 sec	N/A	Yes	Yes
Line 6	Filter Pro	99	N/A	Synths; filters	1	Yes	Y/Y	N/A	+/- 2 octaves	Yes	Yes
Line 6	FM4-Filter Modeler	16/4	Digital modeling of 16 new and vintage filter effects	N/A	1	Yes	N/Y	N/A	2 octaves	No	No
Line 6	Guitar Port	N/A	N/A	Modulation, delays, compression, 10 gitar amps, 10 cabinet models	4	Yes	Y/Y	3 sec	N/A	No	No
Line 6	Mod Pro	90	N/A	Modulation	1	Yes	Y/Y	N/A	N/A	Yes	Yes
Line 6	MM4-Modulation Modeler	16/4	Digital modeling of 16 vintage modulation effects	N/A	1	Yes	N/Y	N/A	N/A	No	No
Line 6	POD 2.0	36/36	N/A	32 guitar amp models; 16 effects (incl. delay, chorus, reverb, flanger, tremolo, rotary); 15 cabinet models	3	Yes	Y/Y	3.2 sec	N/A	Yes	Yes
Line 6	POD Pro	36/36	N/A	32 guitar amp models; 16 effects (incl. delay, chorus, reverb, flanger, tremolo, rotary); 15 cabinet models	3	Yes	Y/Y	3.2 sec	N/A	Yes	Yes
MAM	AFB 8	N/A	8-ch analog filter bank	N/A	1	Yes	Y/Y	N/A	N/A	No	No
MAM	CF 1	N/A	Analog chorus/flanger	N/A	1	Yes	Y/Y	N/A	N/A	No	No
MAM	Phase 2	N/A	Analog phaser	N/A	1	Yes	Y/Y	N/A	N/A	No	No
MAM	RS 3	N/A	3-band modulated resonance filter	N/A	1	No	N/Y	N/A	N/A	No	No
MAM	Warp 9	0/32	Multimode filter	N/A	1	No	Y/Y	N/A	N/A	Yes	Yes
Metasonix	TS-21 Hellfire Modulator	100/100	Wave Shaper	N/A	1	Yes	N/N	N/A	N/A	No	No

DISCRETE PROCESSING CHANNELS	ADC/DAC	OVERLOAD WARNING	INPUTS	OUTPUTS	POWER SUPPLY	SPECIAL FEATURES	PRICE
2	20-bit	Peak LED	(2) 1/4"	(2) 1/4"	Discrete		$199
1	N/A	N/A	1/4", 1/8"	(2) 1/4"	4 AA batteries or adapter	Virtual feedback function; phrase sampler; rhythm trainer mode	$250
8	24-bit	Multi-stage metering	(4) 1/4" TRS	(4) 1/4" TRS	50-60 Hz, 100-240 VAC		$2,995
2	24-bit/24-bit	N/A	(2) 1/4"; (2) XLR; S/PDIF	(2) 1/4"; (2) XLR; S/PDIF	Internal, switching	Discrete reverb processor and separate effects processor elaborate patching and routing system	$899
2	24-bit	2-seg LED; clip light	(2) 1/4"	(2) 1/4"; S/PDIF (coax)	9 VAC (wall transformer provided)	Dual stereo, mono split, cascade, and dual mono configurations	$329
2	24-bit	3-seg LED; clip light	(2) 1/4" TS; RCA S/PDIF	(2) 1/4" TS; RCA S/PDIF	50-60 Hz, 100-240 VAC and 220-2V0VAC	Dual stereo, mono split, cascade, and dual mono configurations	$399
2	24-bit /24-bit	N/A	(2) 1/4"; (2) XLR; S/PDIF	(2) 1/4"; (2) XLR; S/PDIF	Internal, switching	Tap tempo input; 16 adjustable parameters; stand-alone 24-bit A/D converter	$599
3	24-bit /24-bit	N/A	(3) 1/4"	(3) 1/4"; (2) XLR		Fully controllable/assignable MIDI; controllable via optional footswitch	$1,499
2	24-bit	5-seg LED; clip light	(2) 1/4" TRS; XLR; AES/EBU; S/PDIF	(2) 1/4" TRS, XLR; AES/EBU; S/PDIF	50-60 Hz, 100-240 VAC	Unlimited user program storage via PCM CIA card slot; dynamic MIDI patching	$2,995
2	24-bit	5-seg LED; clip light	1/4" TRS; (2) XLR; AES/EBU; S/PDIF	1/4" TRS; (2) XLR; AES/EBU; S/PDIF	50-60 Hz, 100-240 VAC	Unlimited user program storage via PCM CIA card slot; dynamic MIDI patching	$2,995
2	20-bit	Clip light	1/4"	(2) 1/4"	External	Fully parametric EQ; effects crossover; phase-accurate DI and amp model output	$520
2	24-bit	Clip light	1/4"	(2) 1/4"; (2) XLR; S/PDIF; AES/EBU; headphone	Internal	Live and studio modes; fully parametric EQ; effects crossover; dual outputs for phase-accurate DI and amp model; full-time compressor; tuner; cabinet select; Mix 'n Match amps/cabs; re-amping; effects loop; 44.1, 48 kHz selectable; word clock in; MIDI; FB4/floor board support; Emagic SoundDiver editor/lib	$900
1	24-bit	N/A	1/4" guitar input	1/4" guitar input	Battery/AC	Tap tempo; 14-second loop sampler; real time control	$350
1	24-bit	N/A	1/4" guitar input	1/4" guitar input	Battery/AC	True bypass switching; expression pedal input; real time control	$350
1	24-bit	5-segment LED; clip light	1/4" TRS; (2) XLR	1/4" TRS; (2) XLR	50-60 Hz, 100-240 VAC	Expression pedal input; MIDI clock sync	$700
1	24-bit	5-segment LED; clip light	1/4" TRS; (2) XLR	1/4" TRS; (2) XLR	50-60 Hz, 100-240 VAC	Expression pedal input; MIDI clock sync	$700
1	24-bit	N/A	1/4" guitar input	1/4" guitar input	Battery/AC	True bypass switching; expression pedal input; real time control	$350
1	24-bit	Tri-color clip LED	1/4"	RCA; 1/8" stereo mini	Internal	Mix-and-match cabs; full-function audio transport; online membership (tracks, tones, tools); 32-bit processing	$230
1	24-bit	5-segment LED; clip light	1/4" TRS; (2) XLR	1/4" TRS; (2) XLR	50-60 HZ, 100-240 VAC	Expression pedal input; MIDI clock sync	$700
1	24-bit	N/A	1/4" guitar input	1/4" guitar input	Battery/AC	True bypass switching; expression pedal input; real time control	$350
2	20-bit	Clip light	1/4" guitar input	(2) 1/4" TRS; headphone	External	Direct (A.I.R.)/amp modes; MIDI; tap tempo; tuner; cabinet select; Mix 'n Match amps/cabs; FB4/Floor Board support; Emagic SoundDiver editor/librarian (2.0 upgrade available for POD owners)	$520
2	24-bit	Clip light	1/4"	(2) 1/4"; (2) XLR; S/PDIF; AES/EBU; headphone	Internal	Live and studio modes; re-amping; effects loop; word clock in; noise gate; software incl.	$900
1	N/A	N/A	1/4"	1/4"	12 VAC		$139
1	N/A	N/A	1/4"	(2) 1/4"	12 VAC		$219
1	N/A	N/A	(2) 1/4"	(2) 1/4"	12 VAC		$219
1	N/A	N/A	1/4"	(2) 1/4"	12 VAC	Modulation TU	$299
1	N/A	N/A	1/4" TRS	1/4" TRS	12 VAC	Trigger IN	$239
1	N/A	N/A	1/4"	1/4" TRS	50–60Hz; 90–250 VAC	Vacuum tubes; stereo pan and effects	$1,400

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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
Metasonix	TS-22 Pentode Filterbank	N/A	Tube voltage-controlled filter	N/A	1	No	N/N	N/A	N/A	No	No
Miles Technology	MTI-3 TriSonic Imager	N/A	L/C/R sweet-spot enlarger, surround, spreadsound	N/A	2	No	N/N	N/A	N/A	No	No
Moog Music	Moogerfooger CP-251 Control Processor	N/A	Control Voltage Processing	N/A	1	No	N/N	N/A	N/A	No	No
Moog Music	Moogerfooger MF-101 Lowpass Filter	N/A	Two-/four-pole lowpass filter; envelope follower	N/A	1	Yes	Y/Y	N/A	N/A	No	No
Moog Music	Moogerfooger MF-102 Ring Modulator	N/A	Ring modulation; carrier oscillator; LFO	N/A	1	Yes	Y/Y	N/A	N/A	No	No
Moog Music	Moogerfooger MF-103 Twelve-Stage Phaser	N/A	Six-stage/twelve-stage phase shifter	N/A	1	No	Y/Y	N/A	N/A	No	No
Motion Sound	R3-147	N/A	Real rotary horn, 12AX7 tube overdrive	N/A	2	No	N/N	N/A	N/A	Yes	1
Mutronics	Mutator	N/A	Envelope follower	N/A	1	No	Y/Y	N/A	N/A	Yes	No
Peavey	Deltafex	16/0	N/A	Reverb, delay, flange, chorus, phase shift, rotary speaker	1	Yes	Y/Y	225 ms	N/A	No	No
Pefftronics	RTSP-1600 MKII	30/69	Flngr, chrs, dblng	Delay	2	Yes	N/Y	700 ms	N/A	Yes	12
Phonic Hi-Tech	Verbifex	256/0	N/A	Yes	1	Yes	Y/Y	N/A	N/A	No	No
Quantec	Yardstick	30/0		Reverb		Yes	Y/Y	200 ms		No	No
Radial Engineering	2D-7 Injector	N/A	Yes, drag control	N/A	1	Yes	Y/Y	N/A	N/A	No	No
Roland	CST-6 Guitar Effects Processor	200/140	N/A	34	13	Yes	Y/Y	1.80 sed	+/- 2 octaves	Yes	Yes
Roland	ME-33 Guitar Multiple Effects	30/60	N/A	16	9	Yes	Y/Y	2000 ms	+/- 2 octaves	No	No
Roland	VF-1	200/200	MFX	MFX	9	Yes	Y/Y	2,800 ms	±2 octave	Yes	Yes
Roland	VT-1	32/4	N/A	Voice transfer	2	Yes	N/Y	N/A	±1 octave	No	4
Sony	DPS-V55	200/200	N/A	45 algo; rvrb, dly, flngr, chrs, ptch, EQ, comp, rtry	4	Yes	N/Y	2.72 sec	± 2.4 octaves	No	No
Spatializer	Retro	N/A	3-D audio	N/A	1	No	N/Y	N/A	N/A	No	No
SPL Electronics	Charisma 2	N/A	Tube saturation/limiting	N/A	2	No	N/N	N/A	N/A	No	No
SPL Electronics	Charisma 8	N/A	Tube saturation/limiting	N/A	8	No	N/N	N/A	N/A	No	No
Technosaurus	Effexon	N/A	2-band parametric EQ; ring modulator; distortion	N/A	3	No	Y/Y	N/A	N/A	No	No
TC Electronic	1210 Spatial Expander + Stereo Chorus Flanger	N/A	Flngr, ptch mod, expndr	N/A	3	No	N/N	22 ms	N/A	No	No
TC Electronic	1280 Stereo Digital Audio Delay	4/4	N/A	2 sep delay chans	2	No	Y/Y	2.5 sec with chip exp	N/A	Yes	1
TC Electronic	1380 Multitap Digital Audio Delay	4/4	N/A	1	1	No	Y/Y	5 sec with chip exp	N/A	Yes	1
TC Electronic	2290	100/100	N/A	1	2	Yes	Y/Y	8 sec	N/A	Yes	1
TC Electronic	D•Two	50/100	N/A	Stereo/mono, dynamic, rhythm, reverse, chorus, filter, spatial, ping-pong	1	Yes	Y/Y	10 sec	N/A	Yes	Yes
TC Electronic	FireworX	200/100	N/A	35	DSP space dependent	Yes	Y/Y	3 sec	±2 octaves	Yes	Yes
TC Electronic	G-Force	200/100	N/A	Rvrb, dly, ptch, flngr, comp, pan/trml, mod, etc.	8	Yes	Y/Y	1,480 ms	2 octaves	Yes	8
TC Electronic	G-Major	100/100	N/A	Rvrb, dly, ptch, chrs, flngr, comp, gate, filter/mod, etc.	7	Yes	Y/Y	N/A	N/A	Yes	Yes
TC Electronic	M•One	100/100	N/A	20+ effects	2	Yes	Y/Y	4,000 ms	1,200 cents	Yes	Yes
TC Electronic	M2000	256/256	N/A	Rvrb, dly, chrs, flngr, comp, pan, trml, lmtng, de-es, exp, str enhnc	2	Yes	Y/Y	1,200 ms	2 octaves	Yes	16
TC Electronic	M3000	250/200	N/A	Rev, dly, chr, fln, EQ, comp, pan, trml, lim, de-es, exp, gate, str enhnc	2	Yes	N/Y	1,200 ms	2 octaves	Yes	16

DISCRETE PROCESSING CHANNELS	ADC/DAC	OVERLOAD WARNING	INPUTS	OUTPUTS	POWER SUPPLY	SPECIAL FEATURES	PRICE
1	N/A	N/A	1/4" TRS; XLR; 1/4"	1/4" TRS	50–60Hz 90–250 VAC	(4) 2-pole band pass filters	$1,600
2	N/A	N/A	(4) XLR; (2) 1/4" TRS	(5) XLR; (3) 1/4" TRS	AC	Creates L/C/R and surround outputs from 2-channel stereo input	$599
1	N/A	N/A	9 (for control signals)	10 (for control signals)	+9V external power adapter	Extensive control signal processing	$299
1	N/A	N/A	1/4"	(2) 1/4"	External	Drive control; LFO and bypass LEDs; audio; cutoff/resonance, envelope amount; mix	$299
1	N/A	N/A	1/4"	(3) 1/4"	External	Drive control; LFO and bypass LEDs; audio; LFO rate; LFO amount; carrier frequency, mix; carrier	$299
1	N/A	N/A	1/4"	(4) 1/4"	External	Drive and output level controls; level, LFO and bypass LEDs; audio; sweep; resonance; LFO rate; LFO amount, sweep	$399
1	N/A	LED	(2) 1/4"	(2) XLR; (2) 1/4"	Internal	23 adjustable parameters; four horn mics.	$1,300
2	N/A	N/A	1/4"	1/4"	AC	Stereo panning	$1,315-$1,425
2	16-bit/16-bit	Bi-color clip LED	1/4"	1/4"	External		$160
1	16-bit/16-bit	N/A	1/4"	(3) 1/4"	Internal	Random modulation waveforms; hybrid analog/digital design without DSPs	$549
2	16-bit	Dual color peak LEDs	1/4"	1/4"	Internal		$269
	24-bit	Clip LED	XLR; AES/EBU	XLR; AES/EBU	Internal	Optional remote	$2,999
7	N/A	Clip LED	1/4"; XLR	XLR; (7) 1/4"	15V DC	Allows guitar to be routed to 7 amps; 2 effects loops; variable drag control	$799
2	24-bit	LCD; clip light	1/4"; 1/4" TRS	1/4"; 1/4" headphone; S/PDIF (coax)	14VAC; 800 MA included	COSM modeled amps; OD/DS Watts; 15 real-time control knobs	$495
2	24-bit	N/A	1/4"; 1/8" aux	1/4"; 1/8" headphone; S/PDIF (coax)	Batt or 9V	COSM amp model; 6 real-time knobs	$299
2	24-bit/24-bit	3-segment LED; clip light	1/4"	1/4"	AC	S/PDIF output; all Roland effects	$495
1	16-bit/16-bit	Clip light	1/4"	1/4"; (2) RCA	AC	Realtime control over pitch and formant	$395
4	20-bit	Clip light	(4) 1/4"	(4) 1/4"	Internal	52-bit DSP engine; surround sound and other presets	$600
2	N/A	LED	1/4" TRS	1/4" TRS	Internal	3-D audio; mono compatible	$999
2	N/A	N/A	1/4" TRS-XLR combo	1/4" TRS-XLR combo	VAC		$749
8	N/A	N/A	1/4" TRS	1/4" TRS	VAC		$1,699
1	N/A	LED for clip light	1/4"	1/4"	50-60Hz, 100-115VA	True analog	$329
2	N/A	LED	1/4"; XLR	1/4"; XLR	AC	Utilizes Haas principle to create expansion	$1,684
2	18-bit	Overload LED	XLR	XLR	AC	1 MHz sample rate	$2,446
1	18-bit	Overload LED	XLR	XLR	AC	1 MHz sample rate	$2,446
1	1-bit	LED	XLR; 1/4"	XLR; 1/4"	AC	1 MHz sample rate	$1,995
2	24-bit	Yes	S/PIDIF; (2) XLR	(2) XLR; S/PIDIF	Internal, auto-sensing	Rhythm tap; programmable number of repeats	$699
2	24-bit	Overload LED	XLR	XLR	AC	Includes vocoder	$2,195
2	24-bit	Clip light	(2) 1/4"; S/PDIF	(2) 1/4"; S/PDIF	Internal	Intelligent pitch shifting; large 5 x 14 LED display	$1,795
1	24-bit/24-bit	8-seg LED	1/4"	1/4"	100V–240V, 50–60 Hz	Built-in tuner	$699
2	24-bit	Yes	S/PDIF; (2) XLR	(2) XLR; S/PDIF	Internal, auto-sensing	Dual engine routings; serial, parallel, stereo linked, dual mono, dual send/return	$699
2	20-bit	LED	(2) XLR; AES/EBU; S/PDIF	(2) XLR; AES/EBU; S/PDIF	Internal	Dynamic morphing; preset glide control	$1,500
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 control	$2,495

SEE PAGE 174 FOR A COMPLETE LISTING OF MANUFACTURERS' CONTACT INFORMATION

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	P22	4/20	N/A	Delay		Yes	Y/Y	2,600 ms	N/A	Yes	Yes
TC Electronic	Stereo Chorus Flange	N/A	Chorus, flange, pitch	N/A	1	Yes	N/N	N/A	N/A	No	No
TC Electronic	Unity	100/200	N/A	Rev, dly, chr, fln, comp, pan, trml, lim, de-es, exp, ster enhnc	3	Yes	Y/Y	1,200 ms	2 octaves	Yes	16
TC-Helicon	Voice Prism	128/128	Mic pre-A/D	Harmony, reverb, comp, EQ, delay, flange, chorus, human voice	8	Yes	Y/Y	399 ms	N/A	Yes	Yes
TC-Helicon	Voice Prism Plus	128/128	Mic pre-A/D	Harmony, reverb, comp, EQ, delay, flange, chorus, human voice	8	Yes	Y/Y	399 ms	N/A	Yes	Yes
Voce	Spin II	N/A	Various	N/A	1	No	N/Y	N/A	N/A	No	No
Yamaha	ProR3	90	N/A	Rvrb, rm sim, ech, chrs, symphnc, flngr, ptch	3	Yes	Y/Y	N/A	±1 octave	Yes	2
Yamaha	REV100	99	N/A	Ster rvrb, rvrb, dly, flngr, chrs, symphnc	1	Yes	Y/Y	N/A	N/A	Yes	2
Yamaha	REV500	100	N/A	Rvrb, rm sim, ech	1	Yes	Y/Y	200 ms	N/A	Yes	4
Yamaha	SPX990	80	N/A	Rvrb, dly, ech, erly ref, mod, ptch, pan, frz, chrs, symphnc	3	Yes	Y/Y	1,480 ms	±2 octaves	Yes	4
Vermona	PH16	N/A	Phaser	N/A	1	No	Y/Y	N/A	N/A	No	No
Zoom	RFX-300	22/0	N/A	22	2	No	N/N	700 ms	± 1 octave	No	No
Zoom	RFX-1000	121/0	N/A	33	1	No	N/Y	1486 ms	±1 octave	No	No
Zoom	RFX-2000	616/100	N/A	48	2	No	Y/Y	2972 ms	±2 octaves	Yes	No

DISCRETE PROCESSING CHANNELS	A/D C/D/A	OVERLOAD WARNING	INPUTS	OUTPUTS	POWER SUPPLY	SPECIAL FEATURES	PRICE
[illegible]	24-bit/24-bit	8-seg LED	XLR; S/PDIF; AES/EBU	XLR; S/PDIF; AES/EBU	Auto sensing 100V–240V, 50-60 Hz	Real-time, glitch free delay updates	$1,999
1	N/A	N/A	1/4"	1/4"	Internal	Pedal	$399
3	24-bit	Meter	AES/EBU; S/PDIF; ADAT; Toslink	AES/EBU; S/PDIF; ADAT; Toslink	Internal	Software interface within the Yamaha 02R (see software license $795)	$1,495
1	24-bit	10-seg LED	1/4" TRS, XLR; S/PDIF	XLR; 1/4" TRS; S/PDIF	100 VAC/240VAC		$1,898
1	24-bit	10-seg LED	1/4" TRS; XLR; S/PDIF; AES/EBU	XLR; 1/4" TRS, S/PDIF; AES/EBU	100 VAC/240VAC		$1,898
1	N/A	N/A	1/4"	(2) 1/4"	Internal	4 knobs to control speed	$525
2	20-bit	Clip light	(2) XLR	(2) XLR	Internal		$1,299
2	16-bit	Clip light	(2) 1/4"	(2) 1/4"	External		$299
2	20-bit/20-bit	Clip light	(2) 1/4"; (2) XLR	(2) 1/4"; (2) XLR	Internal	Audition switch	$499
2	20-bit/20 bit	Clip light	(2) XLR	(2) XLR	Internal		$1,179
2	N/A	N/A	1/4"	1/4"	VAC		$329
2	18-bit/18-bit	Peak LED	(2) 1/4"; (2) RCA	(2) 1/4"; (2) RCA	External	Power mix, wide mix, boost mix, vocal mix effects	$175
2	18-bit/18-bit	4-seg LED	(2) 1/4"	(2) 1/4"	External	Vocoder, mix effects	$250
2	20-bit/20-bit	6-seg LED	(2) 1/4"	(2) 1/4"; (2) S/PDIF	External	PC editing software included for Macintosh & Windows	$375

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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	DEQ230	Digital	Yes	Graphic	2/30	N/A	No	No	(2) 1/4" TRS
Aphex Systems	104	Analog	No	Exciter	2	N/A	No	No	1/4" TRS
Aphex Systems	109	Analog	No	Parametric variable/0.66–7.2 (or single 4-band)	Dual 2-band unit	20 Hz–2 kHz; 200 Hz–20 kHz	Yes/variable	Switchable shelving	1/4" TRS
API	API 550b EQ	Analog	No	Quasi-parametric, shelving	1/4	30 Hz–20 kHz	No	No	XLR
API	API 560 EQ	Analog	No	Graphic 1 octave	1/10	31 Hz–6 kHz	No	No	XLR
A.R.T.	ART 341	Analog	No	Graphic	2/15	20 Hz-20 kHz; +/-0.5 dB	Yes, -3% center accuracy	No	(2) XLR; (2) 1/4" TRS; RCA
A.R.T.	ART 342	Analog	No	Graphic	2/15	20 Hz-20 kHz; +/-0.5 dB	Yes, -3% center accuracy	No	(2) XLR; (2) 1/4" TRS; RCA
A.R.T.	ART 343	Analog	No	Graphic	2/15	20 Hz-20 kHz; +/-0.5 dB	Yes	No	(2) XLR; (2) 1/4" TRS; RCA
A.R.T.	ART 351	Analog	No	Graphic	2/31	20 Hz-20 kHz; +/-0.5 dB	Yes, -3% center accuracy	No	(2) XLR; (2) 1/4" TRS; RCA
A.R.T.	ART 352	Analog	No	Graphic	2/31	20 Hz-20 kHz; +/-0.5 dB	Yes, -3% center accuracy	HP; LP	(2) XLR; (2) 1/4" TRS; RCA
A.R.T.	ART 353	Analog	No	Graphic	1/31	20 Hz-20 kHz; +/-0.5 dB	Yes	No	(2) XLR; (2) 1/4" TRS; RCA
A.R.T.	ART 355	Analog	No	Graphic	2/31	20 Hz-20 kHz; +/-0.5 dB	Yes, -3% center accuracy	HP; LP	(2) XLR; (2) 1/4" TRS; RCA
A.R.T.	ART HQ 15	Analog	No	Graphic	2/15	20 Hz-20 kHz; +/-0.5 dB	Yes, -3% center accuracy	HP; LP	XLR; 1/4" TRS; RCA
A.R.T.	ART HQ 31	Analog	No	Graphic	1/31	20 Hz-20 kHz; +/-0.5 dB	Yes, -3% center accuracy	HP; LP	XLR; 1/4" TRS; RCA
Ashly Audio	Protea System II	Digital	Yes	Parametric	4/12	20 Hz–20 kHz	No	Digital state variable 1/25–3.3 octaves	N/A
Behringer	Feedback Destroyer Pro DSP1124	Digital	Yes	Parametric 1/60 to 120/60 octaves	2/24	20 Hz–20 kHz	Yes	Parametric	XLR; 1/4" TRS
Behringer	PEQ2200	Analog	No	Parametric/5	2/5	18 Hz-30 kHz	Yes	BP	(2) XLR;
Behringer	Ultra-Curve Pro DSP8024	Digital	Yes	Graphic 1/3-octave; 6 parametric feedback filters	2/31	20 Hz–20 kHz	Yes	Graphic and parametric	XLR; 1/4" TRS
Behringer	Ultra-Graph Pro GEQ3102	Analog	No	1/3 octave	2/31	10 Hz–30 kHz	Yes/ 12 dB/octave	No	XLR; (8) 1/4"
Behringer	Ultra-Q Pro	Analog	No	Parametric/3	2/5	18 Hz-30 kHz	Yes	Bandpass	(2) XLR;
BSS Audio	FCS966	Analog	No	Constant Q/Q = 4	2/30	5 Hz–45 kHz	Yes	HP	XLR; 1/4"; barrier strip
BSS Audio	FDS334	Digital	Yes	Various slopes 0.025 to 3.00 octaves	2/4 over 35 filters	20 Hz–16 kHz	Yes	20 Hz–16 kHz	XLRF2
BSS Audio	FDS366	Digital	Yes	Various slopes 0.025 to 3.00 octaves	N/A	20 Hz–16 kHz	Yes	20 Hz–16 kHz	(3) XLR
Carvin	EQ 2015	Analog	No	Graphic	2/15	N/A	Yes	Low-cut sweep/ high-cut sweep	(2) XLR; (2) 1/4"
Carvin	EQ 2030	Analog	No	Graphic	2/30	N/A	Yes	Low-cut sweep/ high-cut sweep	(2) XLR; (2) 1/4"
Crate	LS1-131	Analog	No	Graphic	1/31	20 Hz–20 kHz	Yes	ISO	XLR; 1/4"; RCA
Crate	LS2-215	Analog	No	Graphic	2/15	20 Hz–20 kHz	Yes	Constant	1/4" TRS; XLR; RCA
Crate	LS3-231	Analog	No	Graphic	1/31	20 Hz–20 kHz	Yes	Constant	1/4" TRS; XLR; RCA
Crate	SM3-PE	Analog	No	Parametric 0.05 to 3 octaves	1/3	15 Hz–22 kHz	No	No	1/4" TRS
dbx	1215 Dual 15 Band Graphic Equalizer	Analog	No	Graphic	2/15	N/A	No	No	1/4"; XLR
dbx	1231 Dual 31 Band Graphic Equalizer	Analog	No	Graphic	2/31	20 Hz–20 kHz	No	No	1/4"; XLR
dbx	2031 Single 31 Band Graphic Equalizer	Analog	No	Graphic	1/31	N/A	No	No	1/4"; XLR
dbx	2215 Dual 15 Band Graphic Equalizer	Analog	No	Graphic	2/15	25 Hz–16 kHz	No	No	1/4"; XLR
dbx	2231 Dual 31 Band Graphic Equalizer	Analog	No	Graphic	2/31	N/A	No	No	1/4"; XLR
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"
D.W Fearn	VT-4	Analog	No	LC Passive	5	N/A	No	HP; LP	(2) XLR
D.W. Fearn	VT-4 Vacuum Tube LC Equalizer	Analog	No	LC/5	1/5	N/A	No	HP; LP	(2) XLR

DIGITAL I/O # /TYPE	INPUT/OUTPUT GAIN CONTROL	MAX BOOST/CUT	OPERATING LEVEL	HARD BYPASS	DYNAMIC RANGE	THD	WEIGHT	DIMENSIONS	PRICE
N/A	Y/Y	1-segment	N/A	Yes	N/A			19x3.5x4	$349
N/A	No	N/A	+4/-10 dB switchable	No	108 dB	0.003%	4	N/A	$299
	Y/Y	±15 dB	+4 dB	Yes	108 dB @ +4 dB	> 0.15 @ +10 dB	3	19x1.75x5.75	$449
N/A	N/N	±12 dB	+4 dB	Yes	130 dB	< 0.07%	21	N/A	$1,295
N/A	N/N	±12 dB	+4 dB	Yes	130 dB	< 0.07%	21	N/A	$795
N/A	N/Y	12 dB	N/A	Yes	N/A	0.01%	4.5	19x1.75x8.5	$229
N/A	N/Y	12 dB	N/A	Yes	N/A	0.01%	4.5	19x3.5x8.5	$279
N/A	N/Y	12 dB	N/A	Yes	N/A	0.01%	4.5	19x1.75x8.5	$159
N/A	N/Y	12 dB	N/A	Yes	N/A	0.01%	4.5	19x1.75x8.5	$229
N/A	N/Y	12 dB	N/A	Yes	N/A	0.01%	4.5	19x3.5x8.5	$279
N/A	N/Y	12 dB	N/A	Yes	N/A	0.01%	4.5	19x1.75x8.5	$159
N/A	N/Y	12 dB	N/A	Yes	N/A	0.01%	9	19x3.5x8.5	$389
N/A	N/Y	12 dB	N/A	Yes	N/A	0.01%	4.5	19x3.5x8.5	$299
N/A	N/Y	12 dB	N/A	Yes	N/A	0.01%	4.5	19x3.5x8.5	$299
N/A	Y/Y	+10/-20 dB	+4 dB	No	>110 dB unweighted	< 0.01% @ 1 kHz, +20 dBu	14	19x3.5x8	$1,619
N/A	Y/Y	+16/-48 dB	-10 dBV/+ 4 dBu	No	104 dB	0.0075%	4.4	19x1.75x7	$159
N/A	Y/Y	+1/-15 dB	+4/-10 switchable	Yes	N/A	0.002%	6.6	1.75 x 8.5 x 19	$125
AES/EBU optional	N/N	graphic: ±16 dB; parametric: +16/-48 dB	+4 dBu	Yes	115 dB	0.004%	11	19x3.5x12	$499
N/A	Y/Y	Filters: ±15 dB; graphic: ±6 or ±12 dB	N/A	Yes	N/A	0.004% @ 1 kHz, +4 dBu	5.5	19x3.5x5.3	$185
N/A	Y/Y	+1-15 dB	+4/-10 switchable	Yes	N/A	0.002%	6.6	1.75 x 8.5 x 19	$125
N/A	N/Y	±15 dB	+4 dBu nominal	Yes	>115 dB	<0.005%	6.6	19x5.25x7.1	$1,095
N/A	N/Y	±15 dB	+4 dBu nominal	No	>106 dB	<0.005%	6.2	19x1.75x8	$1,250
(1) XLR; AES/EBU	N/Y	±15 dB	+4 dBu nominal	No	>112 dB	<0.005%	12	19x1.75x11	$3,699
N/A	Y/N	±15 dB	-10/+4 dB	Yes	104 dB	<0.01%	8	3.5x6x19	$200
N/A	Y/N	±15 dB	-10/+4 dB	Yes	104 dB	<0.01%	11	5.25x6x19	$300
N/A	Y/Y	±6 dB or ±12 dB (switchable)	Variable	Yes	N/A	N/A	4.5	19x1.75 x8.5	$200
N/A	Y/Y	±6 dB or ±12 dB (switchable)	Variable	Yes	N/A	N/A	4.5	19x1.75x8.5	$200
N/A	Y/Y	±6 dB or ±12 dB	Variable	Yes	N/A	N/A	9	19x3.50 x8.5	$300
N/A	Y/Y	+15 dB/ -30 dB	Variable from +4/-10 dB	Yes	N/A	N/A	1.5	5.6x1.6x 5.5	$30
N/A	Y/Y	Yes	+4/-10 dB	Yes	<112 dB unweighted	<0.02% typical @ 1 kHz, +4 dBu	8.5	19x3.5x7.9	$380
N/A	Y/N	Low cut	+4/-10 dB	Yes	115 dB	< 0.005%	10.6	199x5.25x7.9	$520
N/A	Y/N	Low cut	+4/-10 dB	Yes	>108 dB unweigthed	<0.02% typical @ 1 kHz, +4 dBu	8.5	19x3.5x7.9	$550
N/A	Y/N	Low cut	+4/-10 dB	Yes	>112 dB unweighted	< 0.02% typical @ 1 kHz, +4 dBu	8.5	19x3.5x7.9	$600
N/A	Y/N	Low cut	+4/-10 dB	Yes	>108 dB unweighted	< 0.02% typical @ 1 kHz, +4 dBu	N/A	19x5.25x7.9	$750
N/A	Y/Y	±12 dB	+4/-10 dB	Yes	N/A	0.004%	N/A	19xx3.5x6	$300
N/A	Y/Y	±12 dB	+4/-10 dB	Yes	N/A	0.004%	N/A	19x1.75x6	$220
N/A	Y/Y	±12 dB	+4/-10 dB	Yes	N/A	0.004%	N/A	19x1.75x6	$220
N/A	Y/Y	±12 dB	+4/-10 dB	Yes	N/A	0.004%	N/A	19x3.75x6	$220
N/A	Y/Y	±16 dB	+4 dB	No	>90 dB	0.15%	18	19x5.25x18	$3,900
N/A	Y/N	±16 dB	+4 dB	No	>90 dB	<0.08%	16	19x5.25x14	$3,900

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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
Focusrite	ISA 110 Mono Mic Pre and EQ	Analog	No	Parametric	1/4	40 Hz-18 kHz	Yes/variable	LP; HP	1/4" TRS; XLR
Geoffrey Daking	52270 Mic-Pre & 4 Band Equalizer	Analog	No	Discrete -1@10 Hz–3@56 kHz	1/4	N/A	No	HP; LP	XLR
HHB	HHB Radius 20	Analog	No	Parametric/Q range 4.5	2/4	30 Hz–20 kHz	No	No	(4) XLR; 1/4"
Langevin	Pultec EQ	Analog	No	High/low	1/2	20 Hz–20 kHz	Yes/variable	No	XLR, 1/4"
MAM	EQ 2	Analog	No	2 fixed; 1 parametric	2/3 or 1/6	5 Hz-15 kHz	No	HP	(2) 1/4" pairs
Manley Labs	EQP1-A Enhanced Pultec EQ	Analog	No	High/low	1/2	20 Hz–20 kHz	No	No	XLR, 1/4"
Manley Labs	Massive Passive	Analog	No	Passive parametric/1.5 to 3	2/5	22 Hz-27 kHz	Variable	HP; LP	(2) XLR
Manley Labs	MID EQ	Analog	No	Parametric	1/3	200 Hz-5 kHz	Yes	No	XLR, 1/4"
Manley Labs	Stereo Pultec EQ	Analog	No	Parametric	2/3	20 Hz-20 kHz	No	No	(2) XLR; (2) 1/4"
Nightpro	EQ3D	Analog	No	Dimensional	2/6	10 Hz-125 kHz	No	No	XLR
Peavey	EQ215FX	Analog	No	Graphic/2/3 octave	2/15	N/A	Yes	No	XLR; 1/4" TRS
Peavey	EQ31FX	Analog	No	Graphic/1/3 octave	2/15	N/A	Yes	No	XLR; 1/4"
Peavey	Q215B	Analog	No	Graphic/2/3 octave	2/15	N/A	Yes	No	1/4" TRS
Peavey	QF131	Analog	No	Graphic/1/3 octave	1/31	N/A	Yes	No	XLR; 1/4"
Peavey	QF215	Analog	No	Graphic/2/3 octave	2/15	N/A	Yes	No	XLR, 1/4" TRS
PreSonus	DEQ 624	Digital	Yes	Graphic (1/3 octave)	2/31	N/A	Yes	HP; LP	XLR; 1/4" TRS; barrier strip
Rane	GE 30 1/3 oct	Analog	No	Graphic	1/30	N/A	Yes	Hi and lo cut	XLR, screw term
Rane	GE 60	Analog	No	Graphic	2/30	N/A	Yes	Hi and lo cut	XLR; 1/4"TRS; screw term
Rane	ME 15B	Analog	No	Graphic	2/15	N/A	Yes	No	XLR; 1/4" TRS
Rane	ME 30B	Analog	No	Graphic	1/30	N/A	Yes	No	XLR; 1/4" TRS
Rane	ME 60	Analog	No	Graphic	2/30	N/A	Yes	Hi and lo cut	XLR; 1/4" TRS; RCA
Rane	PE 15	Analog	No	Parametric	1/5	20-300 Hz; 60 Hz-1 kHz; 150-2.5 kHz; 450-8 kHz; 1-20 kHz	No	Low shelf	XLR; 1/4"TRS
Rane	PE 17	Analog	No	Parametric	1/5	20 Hz-20 kHz	No	Hi and lo cut	XLR; 1/4" TRS
Raven Labs	True Blue EQ	Analog	No	Semi-parametric	1/5	30 Hz–10 kHz	Yes	No	(4) 1/4" TRS
Sabine	GRAPHI-Q Stereo	Digital	Yes	Multigraphic: 1/3 oct ISO; para: 12 filtrs	2/31	20 Hz–20 kHz	Yes	HP; LP	(4) XLR, 1/4" TRS
Sabine	GRAPHI-Q	Digital	Yes	Multigraphic: 1/3 oct ISO; para: 12 filtrs	1/31	20 Hz–20 kHz	Yes	HP, LP	(3) XLR; (2) 1/4"
Sabine	Power-Q ADF-4000	Digital	Yes	Multigraphic: 1/3 oct ISO; para: 12 filtrs	1/31	20 Hz–20 kHz	Yes	HP; LP	(3) XLR; (3) 1/4" TRS
Sabine	Real-Q2	Digital	Yes	Multigraphic: 1/3 oct ISO	1/31	20 Hz–20 kHz	Yes	HP; LP	(3) XLR, (3) 1/4" TRS
Samson	E30i	Analog	No	Graphic 2/3 octave	2/15	N/A	Yes	Parallel	XLR, 1/4"TRS
Samson	E31i	Analog	No	Graphic 1/3 octave	1/31	N/A	Yes	Parallel	XLR; 1/4"TRS
Samson	E62i	Analog	No	Graphic 1/3 octave	2/31	N/A	Yes	Parallel	XLR; 1/4"TRS
Speck	Model ASC	Analog	No	Q: 0.5–4	1/4	20 Hz–25 kHz	No	LF shelf	(2) XLR; (2) 1/4" TRS
Speck	Model ASC-T	Analog	No	Q: 0.5–4	1/4	20 Hz–25 kHz	No	LF shelf	(2) XLR; (2) 1/4" TRS
SPL Electronics	Classic Vitalizer	Analog	No	Program EQ	2/5	20 Hz–50 kHz	No	Resonant	XLR; 1/4"
SPL Electronics	Qure	Analog	No	Parametric 3-band	2/3	10 Hz–100 kHz	Yes	No	XLR; 1/4"
SPL Electronics	Stereo Vitalizer Jack	Analog	No	Program EQ	2/5	20 Hz–100 kHz	No	Resonant	XLR; 1/4"
SPL Electronics	Stereo Vitalizer MK2	Analog	No	Program EQ	2/5	20 Hz–50 kHz	No	Resonant	XLR; 1/4"
SPL Electronics	Stereo Vitalizer MK2-T	Analog	No	Program EQ	2/5	20 Hz–100 kHz	No	Resonant	XLR; 1/4"
Studiomaster	SEQ 152	Analog	No	Graphic	2/15	20 Hz–20 kHz	Yes	Butterworth	XLR; 1/4" TRS
Studiomaster	SEQ 311	Analog	No	Graphic	1/31	20 Hz–20 kHz	No	Butterworth	XLR; 1/4" TRS
Summit Audio	EQP-200B	Analog	No	Program EQ	2/0	5 Hz–100 kHz	No	HP	(4) XLR
TC Electronic	2240	Analog	Yes	Parametric	2/4	20 Hz–20 kHz	No	No	(2) XLR
TL Audio	Classic EQ2	Analog	No	Parametric	2/4	30 Hz–20 kHz	Yes/variable 0.5–5.	High/low cut	XLR; 1/4" TRS
TL Audio	EQ-1 Dual	Analog	No	Switchable frequency/4	2/4		Yes		(2) XLR; 1/4"
Tube Tech	ME-1B	Analog	No	Mid EQ	1/3	5 Hz–40 kHz	No	No	XLR
XTA	DP202	Digital	Yes	Parametric: 1/32-2 octave	2/8+	20 Hz–20 kHz	Yes/variable	HP; LP	XLR
XTA	GQ600	Analog	No	Graphic 1/3 octave	2/30	N/A	No	No	2

DIGITAL I/O # / TYPE	INPUT/OUTPUT GAIN CONTROL	MAX BOOST/CUT	OPERATING LEVEL	HARD BYPASS	DYNAMIC RANGE	THD	WEIGHT	DIMENSIONS	PRICE
N/A	Y/N	±18 dB	+4 dB	Yes	>98 dB	0.001%	N/A	2U	$2,000
N/A	Y/Y	±17.5 dB	+28 dB	Yes	96 dB	<0.0033%	7.5	12.25x1.75x10.5	$1,495
N/A	Y/Y	±15 dB	+4/-10 dB	Yes	106 dB	N/A	5.5	19x3.5x7.9	$749
N/A	Y/Y	±10 dB (+17 HF boost)	+4/-10 dB	Yes	127 dB	< 0.04%	11	19 x1.75x10	$1,275
N/A	Y/N	±18 dB	+4 dB	Yes	>90 dB	0.005%	1	19x3.5x9	$179
N/A	Y/Y	±10 dB to ±17 dB	+4/-10 dB	Yes	130 dB	< 0.04%	11	19 x1.75x10	$2,150
N/A	Y/Y	±20 dB	-10 or +4 dB	Yes	120 dB	<0.06%	127	19x5.25x10	$4,800
N/A	N/N	±10 dB	+4 dB	Yes	116 dB	<0.04%	12	19x1.75x10	$1,750
N/A	N/N	±17 dB	+4 dB	Yes	116 dB	<0.04%	16	19x3.5x10	$3,300
N/A	N/N	N/A	N/A	No	N/A	0.005%	7	19x1.75x7.5	$1,050
N/A	N/Y	±15 dB	+4 dB	Yes	N/A	0.005%	10.4	19x9.87x3.5	$400
N/A	N/Y	±15 dB	+4 dB	Yes	N/A	0.005%	9.8	19x10.37x3.5	$400
N/A	N/Y	±15 dB	+4/-10 dB	Yes	N/A	0.002%	7.8	19x7.37x3.5	$250
N/A	N/Y	+12/-18 dB	+4/-10 dB	Yes	N/A	0.002%	7.8	19x7.37x3.5	$285
N/A	N/Y	+12/-18 dB	+4/-10 dB	Yes	N/A	0.002%	7.8	19x7.37x3.5	$285
N/A	N/Y	+12/-24 dB	+4 dB	Yes	N/A	0.005%	14	19x3.5x9	$799
N/A	Y/N	±12 dB or -20 cut	+4 dB	Yes	>111 dB	0.0015%	7	19x3.5x8.5	$799
N/A	Y/N	±12 dB	+4 dB	Yes	>108 dB	0.002%	11	19x5.25x8.5	$899
N/A	Y/N	±12 dB	+4 dB	Yes	>107 dB	0.002%	5	19x1.75x5.25	$439
N/A	Y/N	±12 dB	+4 dB	Yes	>107 dB	0.002%	5	19x1.75x5.25	$429
N/A	Y/N	±12 dB	+4 dB	Yes	>107 dB	0.002%	9	19x3.5x8.5	$699
N/A	Y/N	+15/-20 dB	+4 dB	Yes	>108 dB	0.01%	5	19x1.75x5.3	$399
N/A	Y/Y	+12 dB/-15 dB	+4 dB	Yes	>117 dB	0.001%	5	19x1.7 x5.3	$549
N/A	N/N	±15 dB	6v RMS	Yes	N/A	0.005%	3	2.25x6x6.7	$349
RS 232 serial	Y/Y	Graphic: ±6 or ±12 dB; parametric: +12/84 dB	+29 dB	Yes	>110 dB	< 0.01% @ 1 kHz	9	19x3.5x9.5	$1,099 and up
RS 232 serial	Y/Y	Graphic: ±6 or ±12 dB; parametric: +12/-84 dB	+29 dB	Yes	>110 dB	< 0.01% @ 1 kHz, +22 dBv	9	19x3.5x9.5	$700 and up
RS 232 serial	Y/Y	Graphic: ±6 or ±12 dB; parametric: +12/-84 dB	+29 dB	Yes	>110 dB	< 0.01% @ 1 kHz, +22 dBv	9	19x3.5x9.5	$1,799
RS 232 serial	Y/Y	Graphic: ±15 dB	+29 dB	Yes	>110 dB	< 0.02% @ 1 kHz, +22 dBv	9	19x3.5x9.5	$2,000
N/A	Y/Y	±12 dB	+4 dB	Yes	N/A	N/A	4.95	19x1.75x7.5	$280
N/A	Y/Y	±12 dB	+4 dB	Yes	N/A	N/A	4.95	19x1.75x7.5	$280
N/A	Y/Y	±12 dB	+4 dB	Yes	N/A	N/A	9.9	19x3.5x7.5	$420
N/A	Y/Y	±15 dB/band	4 dBu/28 dBu	Yes	>120 dB	0.0014% @ 24 dBu	5	1/2 rack	$645
N/A	Y/Y	±15 dB/band	4 dBu/28 dBu	Yes	>120 dB	0.0014% @ 24 dBu	5	1/2 rack	$749
N/A	Y/N	±20 dB	0 dB/+6 dB	Yes	110 dB	0.002%	7.5	19x1.75x9	$799
N/A	Y/Y	±15 dB; MF +15/-30 dB	0 dB/+6 dB	Yes	119 dB	0.018%	10.8	19x3.4x9	$1,949
N/A	N/N	±20 dB	0 dB	Yes	103 dB	0.018%	4.4	19x1.75x9	$349
N/A	Y/N	±20 dB	0 dB/+6 dB	Yes	110 dB	0.002%	7.5	19x1.75x9	$699
N/A	Y/N	±20 dB	0 dB/+6 dB	Yes	110 dB	0.01855%	7.5	19x1.75x9	$999
N/A	Y/N	±15 dB	-10/+4 dB	Yes	110 dB	> 0.1%	10	19x3.5x10	$349
N/A	Y/N	±15 dB	-10/+4 dB	Yes	110 dB	> 0.1%	10	19x3.5x10	$329
N/A	N/N	±20 dB	+4 dB	Yes	105 dB	0.05% unweighted	19	19x3.5x10	$2,500
N/A	Y/Y	N/A	N/A	Yes	>116 dB	0.015%	7.7	19x3.5x10	$1,288
N/A	Y/Y	±15 dB	-10/+4 dB	No	100 dB	0.05%	N/A	19x5.25x10	$2,499
N/A	Y/N	±12 dB	+4/-10 dB	Yes	105 dB	0.02%	15.5	19x8x3.5	$1,769
N/A	N/N	N/A	N/A	Yes	N/A	0.15%	12.3	19x 5.25x10	$1,819
AES/EBU	Y/Y	-25/+155 dB	+4 dB	No	105 dB	0.02%	8	19x1.75x11.8	$2,475
N/A	Y/Y	±10 dB	+23 dB	Yes	117 dB	0.01%	14	199x5.25x9.3	$1,650

SEE PAGE 174 FOR A COMPLETE LISTING OF MANUFACTURERS' CONTACT INFORMATION

HEADPHONES

MANUFACTURER	MODEL	TYPE	FREQUENCY RESPONSE	SENSITIVITY (DB PER MW)	IMPEDANCE (Ω)	POWER-HANDLING CAPACITY	EAR-CUP DESIGN
AKG	K 141 M	Dynamic	20 Hz–20 kHz	98 dB	600 Ω	200 mW	Semi-open, supraural
AKG	K 240 DF	Dynamic	15 Hz–20 kHz	88 dB	600 Ω	200 mW	Semi-open, circumaural
AKG	K 240 M	Dynamic	15 Hz–20 kHz	88 dB	600 Ω	200 mW	Semi-open, circumaural
AKG	K 270 S	Dynamic	20 Hz–28 kHz	92 dB	75 Ω	200 mW	Sealed, circumaural
AKG	K 301	Dynamic	20 Hz–25 kHz	94 dB	100 Ω	200 mW	Open, circumaural
AKG	K 70	Dynamic	20 Hz–20 kHz	105 dB	100 Ω	200 mW	Semi-open, circumaural
AKG	K 100	Dynamic	20 Hz–28 kHz	103 dB	100 Ω	200 mW	Semi-open, supraural
Audio-Technica	ATH-M30	Dynamic	20 Hz- 20 kHz	100 dB	65 Ω	1,600 mW	Circumaural, closed back
Audio-Technica	ATH-M40fs	Dynamic	5 Hz–28 kHz	100 dB	60 Ω	1,600 mW	Circumaural
Audio-Technica	ATH-D40fs	Dynamic	20 Hz–28 kHz	102 dB	66 Ω	1,600 mW	Circumaural
beyerdynamic	DT-131	Dynamic	30 Hz–18 kHz	N/A	40 Ω	N/A	Open, supraural
beyerdynamic	DT-250	Dynamic	10 Hz–30 kHz	98 dB	80 Ω	10 mW	Closed, circumaural
beyerdynamic	DT-770 Pro	Dynamic	5 Hz–35 kHz	N/A	600 Ω	100 mW	Closed
beyerdynamic	DT-990 Pro	Dynamic	5 Hz–35 kHz	N/A	600 Ω	100 mW	Open, diffuse
beyerdynamic	DT 231	Dynamic	20 Hz–18 kHz	112 dB	32 Ω	N/A	Closed
Carvin	H40M	Dynamic	20 Hz–20 kHz	106 dB	64 Ω	200 mW	Semi-open
Fostex	T-20RP	Printed ribbon	50 Hz–30 kHz	96 dB	50 Ω	200 mW	Semi-open
Fostex	T-40RP	Printed ribbon	30 Hz–20 kHz	98 dB	50 Ω	200 mW	Closed
Fostex	T-50RP	Printed ribbon	15 Hz-35 kHz	102 dB	50 Ω	3000 mW	Semi
Fostex	T-5	Dynamic	65 Hz–20 kHz	96 dB	50 Ω	100 mW	Semi-open
Fostex	T-7	Dynamic	50 Hz–20 kHz	98 dB	50 Ω	100 mW	Semi-open
Koss	A-130	Dynamic	16 Hz–23 kHz	98 dB	60 Ω	100 mW	Closed
Koss	R-10	Dynamic	30 Hz-20 kHz	103 dB	60 Ω	100 mW	Closed
Koss	R-200	Dynamic	18 Hz–23 kHz	84 dB	60 Ω	100 mW	Open
Koss	R-30	Dynamic	18 Hz–20 kHz	106 dB	60 Ω	100 mW	Closed
Koss	R-80	Dynamic	16 Hz–22 kHz	101 dB	60 Ω	100 mW	Closed
Koss	TD/61	Dynamic	25 Hz–15 kHz	93.5 dB	38 Ω	100 mW	Closed
Koss	TD/65	Dynamic	20 Hz–17 kHz	101 dB	90 Ω	100 mW	Closed
Koss	TD/80	Dynamic	20 Hz–17 kHz	98 dB	60 Ω	100 mW	Closed
Koss	A/250	Dynamic	16 Hz–25 kHz	98 dB	60 Ω	100 mW	Open
Koss	UR/15	Dynamic	25 Hz-15 kHz	92 dB	32 Ω	100 mW	Closed
Koss	UR/20	Dynamic	30 Hz–20 kHz	97 dB	32 Ω	100 mW	Closed
Koss	UR/30	Dynamic	18 Hz- 20 kHz	101 dB	100 Ω	100 mW	Closed
Koss	UR/40	Dynamic	15 Hz-22 kHz	98 dB	60 Ω	100 mW	Open
Koss	Pro-4AA	Dynamic	10 Hz–25 kHz	95 dB	250 Ω	100 mW	Closed
Roland	RH-25	Dynamic	20 Hz–18 kHz	118 dB	32 Ω	100 mW	Closed
Roland	RH-50 Stereo Headphones	Dynamic	10 Hz - 22 kHz	106 dB	32 Ω	N/A	Closed
Samson	CH 70	Dynamic	20 Hz–20 kHz	103 dB	32 Ω	120 mW	Closed back
Samson	CH 700	Dynamic	20 Hz–20 kHz	108 dB	64 Ω	120 mW	Closed back
Sennheiser	HD 25	Dynamic	16 Hz–22 kHz	120 dB	70 Ω	200 mW	Closed, supraural
Sennheiser	HD 25 SP	Dynamic	30 Hz–16 kHz	100 dB	85 Ω	200 mW	Closed, supraural
Sennheiser	HD212	Dynamic	12 Hz-19 kHz	112 dB	32 Ω	200 mW	Closed
Sennheiser	HD 265	Dynamic	10 Hz–25 kHz	94 dB	150 Ω	200 mW	Closed, circumaural
Sennheiser	HD280Pro	Dynamic	8 Hz-25 kHz	113 dB	64 Ω	200 mW	Closed
Sennheiser	HD 433	Dynamic	18 Hz–20 kHz	100 dB	32 Ω	100 mW	Open, supraural
Sennheiser	EH2200	Dynamic	12 Hz–22 kHz	106 dB	64 Ω	200 mW	Cicumanural, closed-back
Sennheiser	EH 2270	Dynamic	12 Hz–22 kHz	106 dB	64 Ω	200 mW	Circumaural, closed
Sony	MDR-7506	Dynamic	10 Hz–20 kHz	106 dB	63 Ω	1W	Closed
Sony	MDR-7509	Dynamic	5 Hz–30 kHz	107dB	24 Ω	3,000 mW	Sealed, circum-aural design
Sony	MDR-7505	Dynamic	16 Hz-22 kHz	105 dB	24 Ω	1,000 mW	Closed-back, aura-nomic design
Yamaha	RH5Ma	Dynamic	20 Hz–20 kHz	98 dB	32 Ω	N/A	Closed
Yorkville Sound	Apex HP 30	Dynamic	20 Hz–20 kHz	100 dB	40 Ω	200 mW	Open back
Yorkville Sound	Apex HP 60	Dynamic	20 Hz–20 kHz	100 dB	40 Ω	200 mW	Semi-open back
Yorkville Sound	HP90	Dynamic	20 Hz–20 kHz	102 dB	50 Ω	200 mW	Closed

EAR CUP COVERING	CORD LENGTH	PRICE
Leatherette	10'	$150
Leatherette	10'	$220
Leatherette	10'	$173
Leatherette	10'	$340
Leatherette	10'	$174
Foam	6'	$65
Leatherette	10'	$131
Leatherette	11'	$119
Leatherette	11'	$150
Leatherette	11'	$150
Felt	10'	$59
Felt	10'	$199
Felt	10'	$199
Felt	10'	$199
Cloth-covered foam	10'	$99
Leatherette	9'	$50
Leather	8'	$119
Leather	8'	$139
Leather	8' (removable)	$199
Foam	6'	$89
Foam	6'	$89
Leatherette	8'	$100
Leatherette	8'	$30
Cloth	8'	$70
Leatherette	8'	$40
Leatherette	8'	$50
Leatherette	8'	$20
Leatherette	8'	$30
Leatherette	8'	$50
Leatherette	8'	$150
Leatherette	8'	$20
Leatherette	8'	$25
Leatherette	8'	$35
Leatherette	8'	$40
Leatherette	8'	$100
N/A	8.9'	$25
Leatherette	10'	$50
Plastic	10'	$45
Plastic	10'	$55
Padded vinyl	10'	$260
Padded vinyl	10'	$120
Leatherette	10'	$60
Padded vinyl	10'	$250
Leatherette	10'	$200
Foam	10'	$25
Padded vinyl	10'	$130
Padded, vinyl	10'	$190
Vinyl-covered foam	9.75'	$177
Vinyl	9'	$260
Vinyl	9'	$135
Padded Vinyl	8'	$50
Leatherette	10'	$30
Leatherette	10'	$40
Leatherette	10'	$53

KEYBOARD SYNTHESIZERS & SAMPLERS

MANUFACTUBER	PRODUCT	POLYPHONY / MULTITIMBRAL PABTS	WAVEFORM MEMOBY ROM/RAM	FILTER TYPES / RESONANCE	SINGLE PROGRAMS ROM/RAM	MULTITIMBRAL PERFORMANCES ROM/RAM	PORTAMENTO	GM/GS/XG COMPATIBLE	BUILT-IN COMPUTER INTERFACE/TYPE	DISK DBIVE TYPE	NUMBER OF KEYS	# OF KEYBOARD ZONES (MAX.)	LEFT-HAND CONTROLLERS
Access (GSF)	Virus KB	24/16	N/A	LP, BP, HP, BS	512/0	128	Yes	N/N/N	N/A	N/A	61	16	Pitch; mod
Alesis	QS6.2	64/16	16/0 MB	LP/N	512/128	400/100	Yes	Y/N/N	N/A	N/A	61	16	Pitch and mod wheels
Alesis	QS8.2	64/16	16/0 MB	Y/N	512/128	400/100	Yes	Y/N/N	N/A	N/A	88	16	Pitch and mod wheel
Analogue Solutions	Black Coffee Mono-Synthesizer	1/1	2/0 MB	LP/Y	N/A	N/A	Yes	N/N/N	N/A	N/A	0	0	0
E-mu Systems	MK-6	64/16	32 (exp. to 128)	50+/Y	640/512	0/64	Yes	N/N/N	N/A	N/A	61	4	Pitch wheel; mod wheel
E-mu Systems	PK-6	64/16	32 (exp. to 128)	50+/Y	640/512	0/64	Yes	N/N/N	N/A	N/A	61	4	Pitch wheel; mod wheel
E-mu Systems	XK-6	64/16	32 (exp. to 128)	50+/Y	640/512	0/64	Yes	N/N/N	N/A	N/A	61	4	Pitch wheel; mod wheel
Ensoniq	Halo	61/16	32 (exp. to 128)	50+/Y	640/512	0/64	Yes	N/N/N	N/A	N/A	61	4	Pitch wheel, mod wheel
Generalmusic	Genesys Pro	64/32	64/16 all flash	LP/HP/BP/Y	1,300/800	256/256/128 RAM +	No	Y/Y/N	Yes/SCSI optional	Floppy, HD, CD-RW	61/76/88	32	Pitch/mod
Korg	N264	64/16	8/0 MB	N/A	336/200	200/200	No	Y/N/N	N/A	3.5" HD/DD	76	16	X/Y joystick
Korg	N364	64/16	8/0 MB	N/A	336/200	200/200	No	Y/N/N	N/A	3.5" HD/DD	61	16	X/Y joystick
Korg	Karma	62/16	32 MB	HP; LP/Y	0/640	0/512	Yes	Y/N/N	N/A	3.5" HD/DD	61	16	(2) switch; X/Y joystick, (4) assignable/fixed knobs
Korg	PA-80	62/16	32/0 MB	HP, LP/Y	0/660	0/up to 304	Yes	Y/N/N	Serial PCI/F	3.5" HD/DD	61	2	X/Y joystick
Korg	MS2000	4/1	N/A	LP/BP/HP/Y	0/128	N/A	Yes	N/N/N	N/A	N/A	44	2	Pitch and mod wheels
Korg	Triton	62/16	32/32 MB	HP, LP/Y	0/640	0/512	Yes	Y/N/N	Korg PCI/F	3.5" HD/DD	61	16	X/Y joystick, ribbon; (2) switch; (4) assignable/ fixed knobs
Korg	Triton LE (LE 76)	62/16	32/0 MB	LP/LP+HP/Y	512/512	384/384	Yes	Y/N/N	Optional SCSI	Smart media	61 (76)	16	SS/SW1/SW2
Korg	Triton Pro	62/16	32/32 MB	HP, LP/Y	0/640	0/512	Yes	Y/N/N	Yes/serial, Mac/PC; Korg PCI/F	3.5" HD/DD	76	16	X/Y joystick, ribbon, (2) switch; (4) assignable/ fixed knobs
Korg	Triton Pro X	62/16	32/32 MB	HP, LP/Y	0/640	0/512	Yes	Y/N/N	Yes/serial; Mac/PC, Korg PCI/F	3.5" HD/DD	88 weighted	16	X/Y joystick, ribbon; (2) switch; (4) assignable/ fixed knobs
Korg	Triton Studio (Studio 76, Studio 88)	62/16	48/96 MB	LP/LP+HP/Y	512/1,536	512/1,536	Yes	Y/N/N	4/SCSI	Floppy	61 (76, 88)	16	SS/SW1/SW2/ribbon
Kurzweil	PC2	64/16	0/16 MB	LP, HP, BP, notch/Y	128/128	32/128	Yes	Y/N/N	N/A	N/A	76 semi-weighted	4	(2) wheels; (4) sliders; (6) buttons
Kurzweil	PC2X	64/16	0/16 MB	LP, HP; BP, notch/Y	128/128	32/128	Yes	Y/N/N	N/A	N/A	88 weighted	4	(2) wheels; (4) sliders; (6) buttons
Moog Music	Minimoog Voyager	1/1	N/A	LP, HP/Y	0/128	N/A	Yes	N/N/N	N/A	N/A	44	0	Pitch, mod wheel, release, glide
Nord	Electro 61	146/1	0/6 MB	LP/N	0/6	N/A	No	N/N/N	N/A	N/A	61	2	N/A
Nord	Electro 73	146/1	0/6 MB	LP/N	0/6	N/A	No	N/N/N	N/A	N/A	73	2	N/A
Nord	Lead2	16/4	N/A	BP, HP, LP/Y	59/40	100	Yes	N/N/N	N/A	N/A	49	2	Pitch stick; mod wheel
Nord	Lead3	24/4	N/A	LP, BP, HP, Notch; dual, classic/Y	768	128	Yes	N/N/N	N/A	N/A	49	2	Pitch stick; mod wheel
Nord	Modular Keyboard	16/4	N/A	15 filter types/Y	500	0/0	Yes	N/N/N	N/A	N/A	25	2	N/A
Oberheim	OB12	12/4	N/A	LP, BP, HP/Y	256/256	256/256	Yes	N/N/N	N/A	N/A	49	4	Ribbon controller, pitch wheel; mod wheel
Quasimidi	Sirius	28/7	192/0 MB	LB, HP/Y	672/480	N/A	Yes	N/N/N	N/A	N/A	49	0	2
Roland	JP-8000	8/2	N/A	LP, BP, HP/Y	128/128	64/64	Yes	N/N/N	N/A	N/A	49	0	Pitch, mod lever; ribbon
Roland	RS-5	64/16	32 MB	LP/Y	512/128	128/128	Yes	Y/N/N	N/A	N/A	61	2	Mod/pitch hand lever, 6 real time control knobs
Roland	RS-9	64/16	32 MB	LP/Y	512/128	128/128	Yes	Y/N/N	N/A	N/A	88	2	Mod/pitch lever, 6 real time control knobs
Roland	VK-77	N/A, 64	8 MB	Wheel tables and types	128/128	N/A	No	N/N/N	N/A	N/A	61 upper; 61 lower	6	(21) drawbars

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
N/Y	(1) sustain, (1) pedal	N/A	N/A	N/A	Yes	1/82	(6) 1/4"	Stereo filter inputs; 3 LFOs; 2 env.; 64 waveshapes; input follower effects	Free operating system updates via Web	$2,295
Y/Y	(1) pedal; (4) slider	N/A	N/A	N/A	No	1/20	(2) 1/4"	Sound Bridge software allows user to create their own soundcards	Q Card sound ROM expansion	$899
Y/Y (via MIDI only)	(1) pedal; (4) slider	N/A	N/A	N/A	No	1/20	(2) 1/4"	Sound Bridge software allows the user to create their own soundcards	Q Card sound ROM expansion	$1,499
N/N	(1) pedal	N/A	N/A	N/A	No	N/A	(2) 1/4"	Discrete component analog monosynth; small, portable, Moog-style filter	Pedal; silver finish	$399
N/Y	(1) pedal; (1) footswitch	N/A	N/A	N/A	Yes	2/70	(4) 1/4" TRS	Super beats	Expansion sound ROMs	$1,295
N/Y	(1) pedal; (1) footswitch	N/A	N/A	N/A	Yes	2/70	(4) 1/4" TRS	Super beats	Expandable soundset sounds	$1,295
N/Y	(1) pedal; (1) footswitch	N/A	N/A	N/A	Yes	2/70	(4) 1/4" TRS	Super beats	Expansion sound ROMs	$1,295
N/Y	(1) pedal; (1) footswitch	N/A	N/A	N/A	Yes	2/70	(4) 1/4" TRS	Super beats	Expansion sound ROMs	$1,295
N/Y	(4) pedal	32/192	250,000	12	No	4/57/+3	(4) 1/4"	SCSI		TBA
N/Y	(2) pedal; (2) 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
N/Y	(2) pedal; (2) 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
N/N	Damper, assign switch/pedal	16/192	200,000	Hi, 32, 32T, 16, 16T, 8, 8T, 4, 4T	No	8/102	(4) 1/4", headphone	Variable performance modeler; chord trigger buttons	E&B expansion boards (up to 2); physical modeling	$2,250
N/N	EC5 input; damper; assign switch/pedal	40/192	50,000	Hi, 32, 32T, 16, 16T, 8, 8T, 4, 4T	No	4/89	(4) 1/4", headphone; speaker	2 inputs for effective guitars and vocals; lyric display for SM	Internal HD; output for lyric display	$2,500
N/N	Pedal; switch	Motion sequencer	16 steps	N/A	Yes	2	(8) 1/4"	16 band vocoder, 3 part motion sequencer		$1,100
N/Y	(1 ea) damper, switch, pedal	16/192	200,000	Hi, 32, 32T, 16, 16T, 8, 8T, 4, 4T	Yes	8/102	(6) 1/4", headphone	Sampler, touch screen; user expandable	SCSI, physical modeling; sound RAM expansion for sampling (up to 64 MB)	$2,995
N/Y	(1) assign pedal; (1) assign FS; (1) damper	16/192	200,000	4, 8, 8T, 16, 16T, 32, 32T, hi	Yes	3/89	(4) 1/4"; headphone	Same sounds, arpeggiaters, sequencing capabilities as Triton	EXBSMPL sampling options w/SCSI	$1,600; $1,800 (76)
N/Y	(1 ea) damper, switch, pedal	16/192	200,000	Hi, 32, 32T, 16, 16T, 8, 8T, 4, 4T	Yes	8/102	(6) 1/4", headphone	Sampler, touch screen; user expandable	SCSI, physical modeling; sound RAM expansion for sampling (up to 64 MB)	$3,495
N/Y	(1 ea) damper, switch, pedal	16/192	200,000	Hi, 32, 32T, 16, 16T, 8, 8T, 4, 4T	Yes	8/102	(6) 1/4", headphone	Sampler, touch screen; user expandable	SCSI; physical modeling; sound RAM expansion for sampling (up to 64 MB)	$4,160
N/Y	(1) assign pedal; (1) assign FS; (1) damper	16/192	200,000	4, 4T, 8, 8T, 16, 16T, 32, 32T, hi	Yes	3/89	(6) 1/4"; headphone	Touch screen; up to 120 notes polyphonic w/exp; sampling in every mode; onboard CD burner w/exp	Seven program set exp; physical modeling; 8x CDRW,ADAT optical output; MLAN I/O	$3,400; $3,800 (76); $4,200 (88)
Y/Y	(4) sliders; (5) switches; (2) pedal; (3) FS; breath; ribbon	N/A	N/A	N/A	Yes	2/163	(2) 1/4", stereo digital; headphone	24-bit stereo digital output; 4 zone MIDI; stereo multi-strike recording	Polyphony expansion (128); ROM expansions	$2,650
Y/Y	(4) sliders; (5) switches; (2) pedal; (3) FS; breath; ribbon	N/A	N/A	N/A	Yes	2/163	(2) 1/4", stereo digital; headphone	24-bit stereo digital output; new sounds; 4 zone MIDI; stereo multi-strike recording	Polyphony expansion (128); ROM expansions	$3,150
Y/Y	(10) vol, pan, filter, wave, pitch, mod (2), S&H, env rate, LFO rate, S&H trig, env trig, LFO sync, release	0	N/A	N/A	No	N/A	1/4"	Authentic analog synth with 3 oscillators; dedicated LFO with S&H; 2 mod buses; xyz touchpad controller; dual filter with spacing; 2 ADSR EGRs; external audio in; full MIDI implementation	Signature Edition: lim ed of first 600, signed by Bob Moog, with maple, cherry, or walnut cabinet; clear backlit pitch and mod wheels	$3,495 Signature; $2,995 Performer
N/N	(2) pedal	N/A	N/A	N/A	No	1/6	(2) 1/4"	Modeled B-3, sampled elec pianos; USB port to update sounds		$2,099
N/N	(2) pedal	N/A	N/A	N/A	No	1/6	(2) 1/4"	Modeled B-3, sampled elec pianos; USB port to update sounds		$2,299
N/N	(1 each) switch, exp. pedal	N/A	N/A	N/A	Yes	N/A	(4) 1/4"	Analog modeling synth	PCMCIA cards/1200 presets, 400 perf., etc	$1,799
N/Y	(2) pedals	N/A	N/A	N/A	Yes	N/A	N/A			$2,699
N/N	(1 each) switch, exp. pedal	Step sequencer	Infinite	N/A	Yes	4/30	(4) 1/4"	Editor for Mac & PC allows you to build a synth	16-note voice expansion board	$800
N/Y	(2 each) pedals, exp pedals	1/96	30,000	N/A	Yes	1/4	(4) 1/4"	Screen draws out edited parameters		$1,999
N/N	(1) FS	7/24	N/A	N/A	Yes	2	(2) RCA	Built-in vocoder		$1,299
N/Y	(2) pedal	N/A	23,000	Grid	Yes	3/18	(2) 1/4"	38 knobs and sliders; recordable motion cntrls	DP-2/6 damper pedal; EV-5 expr pedal	$1,695
Y/Y	Hold; assign	N/A	N/A	N/A	Yes	3/51	(2) 1/4"	Favorite bank; XV waveforms; category search	DP-2/6 damper pedal; EV-5 exp pedal	$795
Y/Y	Assign; sustain	N/A	N/A	N/A	Yes	3/51	(2) 1/4"	Dedicated piano button; XV waveforms; category search; favorite bank	DP-2/6 damper pedal; EV-5 exp pedal	$1,295
Y/Y	(1 each) hold, exp, control, pk pedal	N/A	N/A	N/A	No	7/41 incl amp	1/4", XLR, Leslie 13-pin	Leslie simulator; full poly; external control	PK-25 & PK-7 bass pedals; EV-7 expression/KS-77 stand/BNC-25 bench	$5,795

SEE PAGE 174 FOR A COMPLETE LISTING OF MANUFACTURERS' CONTACT INFORMATION

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
Roland	XP-30	64/16	64/exp to 96 MB	LP; BP; HP; peaking/Y	1,406/128	64/32	Yes	Y/N/N	Yes/Mac; PC-1; PC-2	N/A	61	16	Pitch; mod lever
Roland	XP-80	64/16	16/exp to 80 MB	LP; BP; HP; peaking/Y	512/128	64/32	Yes	Y/N/N	N/A	3.5" HD/DD	76	16	Pitch; mod lever; (2) sliders
Roland	XV-88	128/16	64/exp to 224 MB	LP; BP; HP; peaking/Y	1,024/128	64/64	Yes	Y/N/N	Y/Mac; PC-1; PC-2	Smartmedia	88	16	D-Beam; pitch bend/ mod lever; (4) asgn. ctl
Waldorf	Q	16/16	N/A	LB; BP; HP; comb/Y	0/300	0/100	Yes	N/N/N	N/A	Smartcard	61	16	(2) wheels; (2) buttons
Yamaha	CS2	64/16	28/28 MB	3/Y	256/256	0/256	Yes	Y/Y/Y	Yes/serial	N/A	61	4	PB; mod; 8 knobs
Yamaha	CS6x	64/19	28/28 MB	12/Y	256/128	0/128	Yes	Optional	Yes/serial Mac; Win	SmartMedia	61	4	PB; mod; ribbon
Yamaha	MOTIF 6	16/16 (32 options)	85/4 (64 max)	21 (LP, HP, BP, N)/Y	384/128	0/128	Yes	Y/N/N SCSI	Y/USB;	Smart Media	61	4	PB/mod wheel
Yamaha	MOTIF 7	16/16 (32 option)	85/4 (64 max)	21 (LP, HP, BP, N)/Y	384/128	0/128	Yes	Y/N/N	Y/USB; SCSI	Smart Media	76	4	PB/mod wheel
Yamaha	MOTIF 8	16/16 (32 option)	85/4 (64 max)	21 (LP, HP, BP, N)/Y	384/128	0/128	Yes	Y/N/N	Y/USB; SCSI	Smart Media	88	4	PB/mod wheel
Yamaha	S03	64/16	25/0 MB	LP/Y	608/128	0/32	Yes	Y/Y/Y	Y/serial	N/A	61	16	PB/MV
Yamaha	S08	64/16	25.2/0 MB	LP/4	621/128	0/32	Yes	Y/N/Y	Y/USB	Smart Media	88	16	PB/mod wheel
Yamaha	S30	64/17	43/43 MB	12/Y	256/128	0/128	Yes	Optional	Yes	SmartMedia	61	4	PB; mod
Yamaha	S80	64/19	43/43 MB	12/Y	256/128	0/128	Yes	Optional	Yes	SmartMedia	88	4	PB; MOD

By Bill Gibson

SIGNS OF AN AMATEUR MUSICAL RECORDING

Avoid these characteristics in your mixes:

• **No contrast** — The same musical texture throughout the entire song.

• **A frequent lack of focal point** — Holes between lyrics where nothing is brought forward in the mix to hold the listener's attention. A new mixing engineer will often set up the basic rhythm section mix and then leave it completely alone throughout the tune. During the vocal passages there's a focal point, but when there's no vocal, listeners will tend to loose interest and probably fade away from your song.

• **Mixes that are noisy and lacking in clarity and punch** — Although a new engineer will often attribute this to bad tape or a questionable tape machine, it's usually a result of bad mixing technique.

• **Mixes that sound distant and are devoid of any feeling of intimacy** — This is usually the result of too much reverb or overuse of other effects. As a rule of thumb, there should always be at least one instrument in each mix that is dry; this serves a point of reference for the listener. With at least one dry sound, the mix takes on much more of an intimate character than if everything has reverb. Remember, reverb is a tool that adds distance and space to a sound, so if every ingredient in a mix has reverb, the entire mix will sound distant.

• **Inconsistency in levels** — No one likes to listen to a song that all of a sudden reaches out and bites. It's fairly common for a lead vocalist to sing with subtle compassion and feeling one second and in the next breath to go full blast, full volume. If the mixing engineer isn't blending the loud and soft passages in some way, the listener becomes distracted, or worse, annoyed by the blaring loud passages and nearly inaudible soft passages.

• **Dull and uninteresting sounds** — Learn what's accepted as good for your style of music and then start practicing. Practice getting the appropriate sounds for whatever style of music you're working with. ■

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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
Y/Y	(2) pedal assgn/hold	N/A	N/A	N/A	Yes	3/49	1/4" TRS; headphone	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 dmpr pedal	$1,395
Y/Y	(5) pedal	16/96	60,000	Grid; groove; shuffle	Yes	3/49	(4) 1/4"; headphone; click out	4 exp slots; sound palette, disk quickplay, sync exp beatloops to MIDI	SR-JV80 exp brds; DP-2/6 dmpr ped; EV-5 expr pedal	$2,495
N/Y	(3) sustain; (2) assign	N/A	N/A	N/A	Yes	3/69	(4) 1/4"	Seq start/stop button; 2x SRJV exp bd 2x SRX exp	Smartmedia; DP-2/6 sustain foot switch; EV-5 exp pedal	$2,995
Y/Y	(2) switch; (2) CV	Step sequencer	100 patterns	N/A	Yes	2	(3) 1/4", S/PDIF	Stereo analog in; software updates via MIDI	32-voice upgrade; RAM-cards	$3,495
N/A	(1 each) volume foot; FS	N/A	N/A	N/A	Yes	1/88	(2) 1/4", headphone	Scene controller with morphing; analog style knobs	FC4 foot switch; FC7 foot controller	$900
N/Y	(2) FS; (2) foot, (1) breath	16/80	N/A	N/A	Yes	2/135	(4) 1/4"	Phrase clip sampling, 4MB save/load to SmartMedia	PLG series expansion boards x 6 types	$1,795
N/Y	(2) switch, control; breath	16/480	111,000 notes	32d note	Yes	5/108 plus master EG	(4) 1/4"	Integrated sampling sequencer, modular synthesis; plug-in system;	Real-time ext control surface, AIEB2 output exp; mLAN8E; SIMMs	$2,250
N/Y	(2) switch, control; breath	16/480	111,000 notes	32d note	Yes	5/108 plus master EG	(4) 1/4"	Integrated sampling sequencer, modular synthesis, plug-in system;	Real-time ext control surface; AIEB2 output exp; mLAN8E; SIMMs	$2,750
N/Y	(2) switch, control; (1) breath	16/480	111,000 notes	32d note	Yes	5/108 plus master EG	(4) 1/4"	Integrated sampling sequencer, modular synthesis, plug-in system;	Real-time ext control surface, AIEB2 output exp; mLAN8E; SIMMs	$3,250
N/N	(2/1) switch; (1) pedal	N/A	N/A	N/A	No	3/64	N/A			$630
N/N	(1) switch; (1) control	16/480	Direct from Smart Media	N/A	No	3/64	(2) 1/4"	Voice editor, sequencing software included		$1,495
Y/Y	(2) FS	16/ 480	N/A	N/A	Yes	4/127	(2) 1/4"	MIDI master keyboard functions	PLG series plug-in boards 5 types	$1,295
N/Y	(2) FS, (2) foot, (1) breath	16/480	N/A	N/A	Yes	4/127	(4) 1/4"	A/D input; MIDI master keyboard funtion w/ 128 set-ups	Modular synthesis expansion system	$1,995

MICROPHONE & INSTRUMENT PREAMPS

MANUFACTURER	PRODUCT	TYPE	CHANNELS	EQ	OUTPUT LEVEL CONTROL	INSTRUMENT / LINE INPUT	OVERLOAD WARNING	FREQUENCY RESPONSE
Aguilar	DB680 Tube Bass Preamp	Tube	1	Dual fully-parametric	Yes	Yes	No	20 Hz–20 kHz
Amek	9098 EQ	TLA (Transformer like Amplifier)	1	4-band para; vari HP/LP	No	Yes	No	10 Hz–110 kHz, -1.5 dB
Amek	DMA	TLA (Transformer Like Amplifier)	2	HP filter	No	Yes	2x8-seg LED	10 Hz–110 kHz
Aphex Systems	107	Tube	2	Low-cut filter	Yes	No	Clip LED	20 Hz–30 kHz
Aphex Systems	1100	Tube	2	Low-cut filter	Yes	No	No	N/A
API	512C	Solid state	1	No	Yes	Yes	Yes	30 Hz-20 kHz, +0/-3 dB
A.R.T.	DPS (DIO Preamp System)	Tube	2	No	Yes	XLR; 1/4"	Yes	5 Hz-50 kHz
A.R.T.	ART Pro Channel	Tube	1	4-band, low-mids/ mids sweepable	Yes	XLR; 1/4"	Yes	10 Hz-20 kHz, +/- 0.5 dB
A.R.T.	ART TPS (Tube Preamp System)	Tube	2	No	Yes	XLR; 1/4"	Yes	5 Hz-50 kHz
A.R.T.	ART Tube Channel	Tube	1	4-band, low-mids/ mids sweepable	Yes	XLR; 1/4"	Yes	10 Hz-20 kHz, +/- 0.5 dB
A.R.T.	Dual MP	Tube	2	No	Yes	Yes	3-seg LED; clip LED	10 Hz–20 kHz
A.R.T.	Pro MPA	Tube	2	HP filter	Yes	Yes	10-seg LED	20 Hz–40 kHz
A.R.T.	TPS2 Tube Preamp System	Tube	2	No	No	Yes	Analog meter	20Hz-20 kHz
A.R.T.	Tube MP	Tube	1	No	Yes	XLR/1/4"	Yes	10 Hz-20 kHz
A.R.T.	Tube MP OPL	Tube	1	No	Yes	XLR; 1/4"	Yes	10 Hz-20 kHz
A.R.T.	Tube MP Studio	Tube	1	No	Yes	XLR; 1/4"	Yes	10 Hz-20 kHz
A.R.T.	Tube MP Studio V3	Tube	1	No	Yes	XLR; 1/4"	Yes	10 Hz-20 kHz
ATI	8MX2	Solid state	8	No	Yes	Yes	2x10–seg LED	20 Hz–20 kHz
Avalon Design	M5	Discrete (class A)	1	HP filter	Yes	Yes	Analog VU; (2) signal peak LEDs	5 Hz–120 kHz
Behringer	UltragainPro MIC2200	Tube	2	Parametric; low-cut	Yes	Yes	Yes	10 Hz–200 kHz, ±3 dB
Behringer	Tube Ultragrain T1953	Tube	2	Tuneable HP filter	Yes	Yes	Clip LED	18 Hz–30 kHz
Bellari	MP110 Direct Drive	Tube	1	No	Yes	Yes	Yes	20 Hz–40 kHz
Bellari	RP220	Tube	2	No	Yes	Yes	5-seg LED; clip LED	20 Hz–40 kHz
Bellari	RP520	Tube	2	No	Yes	Yes	Clip LED	20 Hz–40 kHz
Benchmark	Mic-Man Jr.	Solid state	2	No	No	No	No	1 Hz–300 kHz
Benchmark	MPS-400	Solid state	4	No	No	Yes	No	0.2 Hz-500 kHz
beyerdynamic	MV100	Solid state	2	HP filter	No	No	Clip LED	18 Hz–22 kHz
Crest Audio	iPro Two	Solid state	1	(2) full parametric	Yes	Yes	(2) 12-seg LED	20 Hz-35 kHz
Crest Audio	ST2	Solid state	2	(2) full parametric	Yes	Yes	(2) 10-seg LED	20 Hz-20 kHz
Curtis Technology	Opre2	Solid state	2	No	Yes	No	No	10 Hz–0 Khz
D.W. Fearn	VT-1/VT-2	Tube	2	No	Yes	No	VU meter	5 Hz–28 KHz
DACS	DACS MicAmp	Discrete	2	Bass rolloff	No	No	No	20 Hz–55 kHz
dbx	386	Tube	2	No	Yes	Yes	No	10 Hz–75 kHz
Demeter	VTMP-2c Stereo	Tube	2	Low-cut filter	Yes	Yes	LED meter	10 Hz–40 kHz
Demeter	VTBP-201 S Tube Bass Preamp	Tube	1	Treble; mid; bass (w/sel freq); presence	No	Yes	No	N/A
Demeter	VTMP-2cx Stereo	Tube	2	Low-cut filter	Yes	Yes	LED meter	10 Hz–40 kHz
Demeter	H MP-1 Stereo	Tube	2	Low-cut filter	Yes	Yes	10-seg LED	10 Hz–80 kHz
Denecke	AD20	Solid state	2	No	Yes	Optional	No	10 Hz–20 kHz
Denecke	Zefiro In Box Preamp	Solid state	2	No	Yes	Optional	No	10 Hz–21 kHz

NOISE	TOTAL HARMONIC DISTORTION	SPECIAL FEATURES	PRICE
-80 dB	0.4%	Selectable inputs; passive/active inputs; tuner out; footswtich; balanced out; crossover	$1,895
-100 dBu	<0.01%	Phantom; notch filters; Neve glow and sheen	$1,995
-104 dBu S/N	<0.01%	Phantom; MS surround	$1,710
-128 dBu EIN	0.2%	Remote mute; Tubessence; phantom; gain control; pad	$449
-135 dBu EIN	@+15 dBu 0.12% @+4 dBu 0.05%	Mic limiter; 24-bit/96 kHz digital out	$2,495
-129 dB	<0.05%	Re-issue 70's API mic pre; 7-seg input LED; phase; phant; 20 dB pad; fits 500 Series frames/consoles	$825
-129 dBu	<0.01% (clean settings); ><0.1% (warm settings)	Vacuum tube; output protection limiter; VU meter; variable valve voicing; ADAT, TOSLINK, and S/PDIF outputs	$319
-130 dBu (XLR to XLR, "A" weighted)	<0.01% (clean settings); ><0.1% (warm settings)	Tube parametric EQ; switchable optical/variable mu tube comp	$799
-129 dBu	<0.01% (clean) settings); ><0.1% (warm settings	Vacuum tube; output protection limiter; VU meters; variable valve voicing	$219
-129 dBu (XLR to XLR, "A" weighted)	<0.01% (clean settings); ><0.1% (warm settings)	Tube parametric EQ; optical comp	$525
-129 dBu EIN	<0.1%	Phase; phantom; +20 dB gain switch	$349
-132 dBu EIN	<0.1%	Output-level VU meters; phase; phantom; 5-year warranty	$649
N/A	N/A	V3 variable valve voicing; phantom power; 20 dB phase switch	$219
-129 dBu	0.1% (typical)	Vacuum tube	$99
-129 dBu	0.1% (typical)	Vacuum tube; output protection limiter	$114
-129 dBu	0.1% (typical)	Vacuum tube; output protection limiter; VU meter	$129
-129 dBu	0.1% (typical)	Vacuum tube; output protection limiter; VU meter; variable valve voicing	$149
-129 dBm EIN	0.006%	Limiter on each input (8); phase; phant and grnd lift on each channel; 8x2 mixer with 8 outs	$1,899
-126 dB EIN	0.05%	Ext B2T power supply (100/240V); polarity; 20 dB pad; DI in; opt B&K 130V phantom power	$1,600
N/A	0.011%	12AX7 vacuum tube; phantom power; phase reverse	$199
>108 dB S/N	N/A	Phantom power; line driver; phase; balanced I/O	$399
90 dB	0.1%	Transformer-balanced inputs; phase; pad	$230
107 dB S/N	0.1%	Transformer-balanced inputs; phase; pad	$500
107 dB S/N	0.1%	Analog VU meters; transformer-balanced inputs; phase; pad	$600
1 dB noise figure	0.001%	Portable AC/DC operation; gain range: +26 to +76 dB	$435
-130 dB EIN	0.0009%	48V phantom power; 500 kHz bandwidth at all settings; +28 dBu max output	$1,125
-128 dB EIN	0.03%	Headphone monitoring	$799
88 dBu S/N; -129 dBu EIN	0.005%	Phantom; 20 dB pad	$649
86 dBu S/N; -129 dBu EIN	0.005%	Two mic/line inputs on front and rear	$699
-129 dB	0.03%	Lundahl input transformer	$1,295
-124 dBu EIN	0.2 %	Phantom; phase; 20 dB pad; low impedence in for transfomerless mics	$2,000/$3,500
-133 dB	0.002%	Phantom	$2,125
0.35% at +4 dBu out, 1kHz, 480 dB gain	0.35%	AES/EBU and S/PIF digital outputs	$599
-124 dB EIN	0.016%	Jensen input transformers; phase; LC; pad; variable tube gain	$2,299
N/A	N/A	Jensen DBE mic level output transformer; effects loop; balanced out	$799
-124 EdB IN	0.016%	Phantom; Jensen in/out transformers; phase; ILC; pad; variable tube gain	$2,549
-124 dB EIN	0.012%	Jensen input transformer; phase; LC; pad; variable tube gain	$1,299
99 dB S/N (A/D) 125.4 dBm EIN	0.0016%	20-bit A/D; S/PDIF optical/coax out	$325
99 dB S/N; -125.4 dB EIN	0.008%	20-bit A/D; S/PDIF optical/coax out	$395

SEE PAGE 174 FOR A COMPLETE LISTING OF MANUFACTURERS' CONTACT INFORMATION

By Bobby Owsinski

CALCULATING THE DELAY TIME

If you don't know the tempo in beats per minute:

Start a stopwatch when the song is playing and count 25 beats.

Stop the stopwatch on the 25th beat and multiply the time by 41.81

When the beats-per-minute rate is known, most engineers determine the delay time by looking at a chart that identifies the delay time at any rate, by using a utility program found on some computers (StudioCalc for the Mac is a popular one), or by using a tap function found on many effects devices. When none of these are available, you can still determine the delay time by using a little math:

60,000/song tempo (in beats per minute) = quarter-note delay in milliseconds

All other values can be determined from this by doing any of the following:

- Dividing by 2 for the lower denominations
- Multiplying any of the above by 1.5 for dotted values
- Multiplying any of the above by 667 for triplet values ■

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MICROPHONE & INSTRUMENT PREAMPS

MANUFACTURER	PRODUCT	TYPE	CHANNELS	EQ	OUTPUT LEVEL CONTROL	INSTRUMENT / LINE INPUT	OVERLOAD WARNING	FREQUENCY RESPONSE
Digidesign	PRE	Solid state	8	Hi-pass filter	Yes	Yes	Peak Meter (14-seg), Channel Status monitoring (6-seg)	10 Hz–100 kHz, -3 dB
Earthworks	LAB102/LAB101	Solid state	2/1	No	Yes	No	Clip LED	2 Hz–100 kHz, ± 0.1 dB
Event Electronics	EMP-8	Solid state	8	No	No	0/8	2 LEDs per ch. (signal present and clip)	20 Hz-50 kHz
Fishman	Acoustic Blender/ Acoustic Bass Blender	Solid state	2	Active shelving style; bass; treble; low-cut filter	Yes	Yes	No	20 Hz–20 kHz
Fishman	B II Acoustic Bass Preamp	Solid state	1	Treble; bass	Yes	Yes	No	N/A
Fishman	G-II Acoustic Guitar/ Instrument Preamp	Solid state	1	Treble; bass	Yes	Yes	No	N/A
Fishman	Pocket Blender	Solid state	2	Active shelving style; bass; treble; high/low-cut filters	Yes	Yes	No	20 Hz–20 kHz
Fishman	Pro-EQ II	Solid state	1	4-band graphic	Yes	Yes	No	N/A
Fishman	Pro EQ Platinum Bass	Solid state	1	5-band; low-cut filter (depth control)	Yes	Yes	Clip LED	20 Hz-20 kHz
Focusrite	Red 1 Quad	Solid state	4	No	No	No	VU meter	10 Hz–140 kHz
Focusrite	Red 7	Solid state	1	High-pass filter	Yes	Yes	VU meter	10 Hz–140 kHz
Focusrite	Red 8 Dual	Solid state	2	No	No	No	VU meter	10 Hz–140 kHz
Geoffrey Daking	52270B Mic-Pre & 4-Band Equalizer	Solid state	1	4-band with HP and LP filters	Yes	Yes	No	10 Hz–56 kHz
George Massenburg Labs	8300	Solid state	2	No	No	No	Clip LED	1 Hz–20 kHz
George Massenburg Labs	8302	Solid state	2	No	No	No	Clip LED	1 Hz-200 kHz
George Massenburg Labs	8304	Solid state	4	No	No	No	Clip LED	1 Hz–200 kHz
Grace Design	Lunatec V2	Solid state (portable)	2	HP filter	Yes	No	Yes	6 Hz–250 kHz, ±3 dB
Grace Design	Model 101	Solid state	1	Low-cut filter @ 75 Hz	Yes	Yes	(2) VU	4.5 Hz–400 kHz, ±3 dB @ 40 dB gain
Grace Design	Model 201	Solid state	2	No	Yes	No	Yes	4.5 Hz–1.0 MHz, ±3 dB
Grace Design	Model 801	Solid state	8	No	Optional	No	Yes	4.5 Hz–1 MHz, ±3 dB
Grace Design	Model 801R	Solid state	8	No	No	No	Full digital metering/ peak hold and reset	4.5 Hz–1 MHz, ±3 dB
Great River Electronics	MP-2	Solid state	2	No	No	Yes	Overload LED	10-60 kHz +/- 0.5 dB
Great River Electronics	MP-2MH	Solid state	2	No	No	Yes	Overload LED	10 Hz–60 kHz, ± 0.5 dB
Great River Electronics	MP-2NV	Solid state	2	No	Yes	Yes	2 LED meters per channel	10 Hz–30 kHz, ±1 dB @ 40 dB gain
HHB	Radius 10	Tube	4	HP filter; low-cut	Yes	No	Drive/peak LEDs	10 Hz–40 kHz
Langevin	Dual Mono	Solid state	2	High and low shelving	No	Yes	No	10 Hz–20 kHz
Manley Labs	Dual Mono	Tube	2	No	No	Yes	No	10 Hz–60 kHz
Manley Labs	MIC/EQ 500	Tube	1	Stepped LF and HF; passive vintage EQ	Yes	Yes	VU meter	5 Hz–60 kHz
Manley Labs	Mono Mic Pre	Tube	1	No	No	Yes	No	10Hz–20 kHz
Martech	MSS-10	Solid state	1	No	Yes	Yes	VU meter	10 Hz–20 kHz
M Audio	DMP3	Solid state	2	No	Yes	Yes	(2) VU meters, clip light	20 Hz-100 kHz
M Audio	Tampa	Solid state	1	Low cut	Yes	Yes	VU meter; clip light	20 Hz-20 kHz
Midiman	Audio Buddy	Solid state	2	No	No	Yes	Yes	5 Hz–50 kHz
Millennia Media	HV-3B	Solid state	2	No	Yes	No	Clip LED	1 Hz–300 kHz
Neotek	Martinsound MicMAX	Solid state	2	No	No	No	No	5 Hz–150 kHz +0/-3 dB
Neumann	P2 Analog	Solid stage	2	Highpass filters at 40, 80 Hz	Yes	Yes (2)	No	1.5 Hz-500 kHz

NOISE	TOTAL HARMONIC DISTORTION	SPECIAL FEATURES	PRICE
-128 dB @ 66 dB of gain, EIN	0.0005 % THD + N @ 1 kHz, 0 dB gain	Remote controllable; soft-clip limiter, standalone capability; phase reverse; 48V phantom power; MIDI In/Out/Thru	$2,495
EIN: -125 dBv @ 20 dB of gain, -133 dBv @ 40 dB gain	0.02%	Multiple outs per channel; phase; phantom; standby	$750–$1,500
>98 dB S/N/-129.5 EIN	<0.008%	ADAT optical out; 24-bit A/D/A conversion; 44.1, 48 kHz sample rates; (8) line outputs; (8) pad switches; +48V phantom power; word clock	$649
81 dB (A-weighted, ref to nom -20 dBV input)	0.2%	Separate mic/piezo transducer channels with dedicated effects loops/phase reverse; phantom	$500
N/A	N/A	Input trim; injection molded case, suitable as floor unit; belt/strap pack or with mic-stand adapter	$110
N/A	N/A	Input trim; injection molded case; suitable as floor unit; belt/strap pack or with mic-stand adapter	$110
87 dB (A-weighted, ref to nom -20 dBV input)	0.7%	Separate mic/piezo transducer channels with dedicated effects loops/phase revervse; phantom	$420
N/A	N/A	Sub bass trim; input trim, injection molded case	$160
89 dBu (91 dBv)	105%	Phantom power; comp (1 knob); phase; tuner out; XLR (with ground lift); 1/4" out	$250
-128 dB EIN	0.003%	Phantom power; phase on each channel; stepped gain	$2,795
-128 dB EIN	0.006%	Transformer-balanced I/O mic-preamp with mono channel dynamics optimised for vocals	$2,395
-128 dB EIN	0.003%	Phantom power; phase on each channel, stepped gain	$1,895
-96 dB with 26 dB of gain and EQ bypassed	<0.0033%	Mute, phase ; 20 dB pad; phantom	$1,595
-127 dBu EIN	0.0008%	Phantom; can be upgraded to 4 channels for $1,200	$2,195
-127 dBU EIN	0.0008%	Phantom; all-discrete class-A; +15-70 dB gain in 5 dB increments; upgradable to 4 channels	$2,000
-127 dBU EIN	0.0008%	Phantom; all-discrete class-A; +15-70 dB gain in 5 dB increments	$2,800
<-130 dB @ 60 dB gain	0.0011%	Studio quality in a battery operated package	$1,495
<-130 dB @ 60 dB gain	0.001%	Phantom power; XLR and 1/4"outputs	$695
<-130 dB @ 60 dB gain	0.0015%	24-position gold contact rotary gian controls	$1,995
<-130 dB @ 60 dB gain	0.001%	24-position gold contact rotary gain controls	$4,795
<-130 dB @ 60 dB gain	0.001%	Fully remote control: up to 64 channels from 1000'; full MIDI control; optional desktop controller ($995)	$5,495
0129 dB EIN 150 source @ 40 dB gain	<0.007%	Phantom; ploarity; pad; 2 dB stepped gain	$1,799
-129 dB EIN 150 source @ 40 dB gain	<0.007%	Phantom, polarity; pad switches, 2 dB stepped gain	$2,299
-125 dB EIN 150 source @ 40 dB gain	<0.02%	Phantom; polarity; IA port impedance; 5 dB stepped input gain	$2,499
-127 dB EIN	N/A	Phantom; phase per channel	$749
80 dB S/N	0.05%	All discrete; two channels	$1,475
80 dB S/N	0.05%	High headroom	$2,400
100 dB S/N	0.025%	Fully-differential circuitry	$2,900
80 dB S/N	0.05%	High headroom	$1,600
-129.5 dBu typical	<-0.0015%		$1,995
>110 dB	0.002%	Phase reverse option	$250
>110 dB	N/A	Digital converters with sample rates to 96 kHz	$800
-122 dBu	0.1%		$120
-129 dB EIN	0.001%	Fully balanced, B&K mic option	$1,895
N/A	<0.001%	Microphone impedance matching via switch selection	$1,495
-132 dB EIN	0.0008%	MIs decoding; two premium performance DIs	$1,750

SEE PAGE 174 FOR A COMPLETE LISTING OF MANUFACTURERS' CONTACT INFORMATION

By Bobby Owsinski

EQING REVERBS AND DELAYS

From the early days of reverb chambers and plates, it's always been common to EQ the reverb returns, although the reasons for doing this have changed over the years. Back when plates and chambers were all that was available, usually some high-frequency EQ at 10kHz or 15kHz was added because the plates and chambers tended to be dark sounding and the reverb would get lost in the mix without the extra high frequency energy.

Nowadays, EQ is added to reverb in order to help create some sonic layering. Here are some points to consider when EQing a reverb return. The type of reverb (digital, real plate, etc.) doesn't matter as much as how these are applied, and that depends on your ears and the song.

- To make an effect stick out, brighten it up.
- To make an effect blend in, darken it up (filter out the highs).
- If the part is busy (like with drums), roll off the low end of the effect to make it fit.
- If the part is open, add low end to the effect to fill in the space.
- If the source part is mono and panned hard to one side, make one side of the stereo effect brighter and the other darker. (Eddie Van Halen's guitar on the first two Van Halen albums comes to mind here.) ■

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MICROPHONE & INSTRUMENT PREAMPS

MANUFACTURER	PRODUCT	TYPE	CHANNELS	EQ	OUTPUT LEVEL CONTROL	INSTRUMENT / LINE INPUT	OVERLOAD WARNING	FREQUENCY RESPONSE
Nightpro	PreQ3	Solid state	2 or 4	1-band (sel freq); broad-band shelving; LF rolloff	No	Yes	Peak LED 3 db before clip	15 Hz–40 kHz
Oram Pro	Octasonic	Solid state	8	No	No	Yes	Preclip LED	20 Hz–40 kHz
Peavey	TMP-1	Tube (class A)	1	No	Yes	Yes	No	20 Hz–20 kHz, +0/-3 dB
Pendulum	MDP-1	Tube (class A)	2	10-position low-cut filter	Yes	Yes	VU meter	5 Hz–300 kHz
Pendulum	SPS-1 Preamp for Acoustic Instruments	Solid state (class A)	2	3-band parametric on each ch.	Yes	Yes	Signal, peak LEDs	20 Hz-100 kHz
Phoenix Audio	GTQ2	Solid state	2	3-band, sweep mids	Yes	Yes	No	20–20 kHz, ±1 dB
PreSonus	Acoustic-Q	Tube	2	1-band parametric	Yes	Yes	15-seg LED	10 Hz-50 kHz
PreSonus	Blue Tube	Tube/solid state hybrid	2	No	Yes	Yes	Clip LED	20 Hz–40 kHz
PreSonus	Digimax	Discrete (class A) with digital outputs	8	Yes	Yes	Yes	Clip LED	20 Hz–40 kHz
PreSonus	DigiMAX LT	Solid state	8	No	Yes	Yes	(8) 3-seg LED	20 Hz-50 kHz
PreSonus	Digitube	Tube	1	3-band (sweepable); low-cut filter	No	Yes	8-seg LED	10 Hz-50 kHz
PreSonus	M80 and MP20	Discrete (class A)	2 or 8	Low-cut filter	Yes	Yes	Clip LED	10 Hz–30 kHz
Radio Design Labs	RU-MX5	Solid state	5	No	Yes	No	3-seg LED	70 Hz–30 kHz
Radio Design Labs	ST-MMX3	Solid state	3	No	Yes	No	No	10 Hz–18 kHz
Radio Design Labs	ST-VCA1	Solid state	1	No	Yes	Yes	No	20 Hz–22 kHz
Radio Design Labs	STM-1	Solid state	1	No	No	No	No	50 Hz–30 kHz
Radio Design Labs	STM-2	Solid state	1	No	Yes	No	No	50 Hz–25 kHz
Radio Design Labs	STM-2X	Solid state	1	No	Yes	No	No	50 Hz–25 kHz
Radio Design Labs	STM-3	Solid state	1	No	Yes	No	No	50 Hz–25 kHz
Rane	AP 13 Acoustic Instrument Preamp	Solid state	2	(2) low cut, 7-band graphic	Yes	Yes	No	20 Hz-20 kHz
Rane	DMS22	Solid state	2	3-band with sweepable parametric mid	Yes	No	Clip LED	20 Hz–200 kHz
Rane	MS1b	Solid state	1	No	Yes	No	Clip LED	20 Hz–20 kHz
Raven Labs	PMB-1 Master Blender	Solid state	2	Bass; mid; treble for each channel	Yes	Yes	No	30 Hz–30 kHz
Requisite Audio	Y7s MkIII	Tube (with ribbon input)	1	Feedback control	Yes	Yes	VU meters	10 Hz-100 kHz
Royer Labs	SX-M2	Solid state	2	Low-cut 18 dB/oct, -3 dB @ 70 H	No	Yes	Peak, power	20 Hz–20 kHz, ±0.5 dB
SPL Electronics	Gold Mike	Tube	2	Low-cut filter	Yes	Yes	No	10 Hz- 100 kHz
Studio Projects	VTB-1	Tube	1	Yes	Yes	Yes	5-segment LED	20 Hz-20 kHz
Studio Technologies	Mic-PreEminence	Solid state	2	No	Yes	No	5-seg LED	20 Hz–60 kHz
Summit Audio	MPC-100A	Tube/solid state hybrid	1	No	Yes	Yes	Clip LED, VU meter	5 Hz–65 kHz
Symetrix	302 Dual	Solid state	2	No	Yes	No	Clip LED	20 Hz–20 kHz
Sytek	EQ4B-1M	Solid state	1	4-band parametric	No	Yes	Peak LED	10 Hz–85 kHz
Sytek	MPT-1A	Tube	1	No	Yes	No	Peak LED	10 Hz–75 kHz
Sytek	MPX-4A ii	Solid state	4	No	Yes	No	Peak LED	10 Hz–85 kHz
TC Electronic	1140 Parametric Equalizer Mic Preamp	Solid state	1	2-band parametric	Yes	Yes	Overload LED	N/A
The John Hardy Co.	Jensen Twin Servo 990	Solid state (class A)	1–4 (expandable)	No	No	No	20-seg LED, clip LED	N/A
The John Hardy Co.	M-1	Solid state (class A)	1–4 (expandable)	No	No	No	20-seg LED, clip LED	N/A
The John Hardy Co.	M-2	Solid state (class A)	1	No	No	No	No	N/A
TL Audio	Classic PA1 Pentode Preamp	Tube	2	Low- and high-cut filters	Yes	Yes	Drive and peak LEDs	30 Hz–40 kHz
True Systems	Precision 8	Solid state	8	No	No	Yes	OL light, peak meters	1.5 Hz–500 kHz
Tube Tech	MP-1A	Tube	2	No	Yes	Yes	No	15 Hz–60 kHz
Tube Tech	PE-1C	Solid state	1	No	No	No	No	N/A
Universal Audio	2-610 Dual Channel Tube	Tube	2	HF + LF shelf with selectable corner frequency	Yes	Yes	No	20 Hz–20 kHz ±1 dB

NOISE	TOTAL HARMONIC DISTORTION	SPECIAL FEATURES	PRICE
-126 dBu EIN	0.003%	Vari air-band EQ	$1,675–$2,675
-127.5 dB EIN	0.005%	Phase; phantom per ch; 2 high-level inputs	$2,118
106 dBv @ 150 Ωs	0.2%	+24 V phantom power; LED level meter; input volume pot; XLR and 1/4" I/O	$290
-125 dBu EIN	0.03%	All-tube signal path; transformerless out; fully-regulated power supply with soft-start; phase; -20 dB pad	$2,495
<116 dB EIN (instrument)	<0.01%	Phantom power	$1,395
-45 dBu at 80 dB gain (22 Hz–22 kHz filter)	<0.075%	All discrete, class A circuitry	$1,995
>90 dB	0.005%	Phantom power, insert, optional footswitch	$299
-94 dB	<0.05%	Phase reverse, 1/4" and XLR I/O, 20 dB pad	$200
-94 dB	<0.009%	Dual domain limiters on each channel; analog and digital: ADAT, AES/EBU, S/PDIF	$1,700
>98 dB	<0.009%	(8) inserts, BNC I/O, ADAT output; (8) pads; (8) 48V phantom power; adjustable sample rates	$999
>90 dB	0.05%	Drive knob, S/PDIF out, BNC in, insert, 20 dB pad; phantom power	$299
<-127.5 dB	0.001%–0.5%	Transformer-coupled input; dual-servo gain stage; mix bus assign; IDSS control	$2,300/$700
70 dB S/N	0.030%	5-channel active line mixer/mic pre with phantom	$255
70 dB S/N	0.2%	Small size (about 0.5"x1.5"x3"); indiv gain adjustment	$130
80 dB S/N	0.05%	Small (approx. 0.5"x1.5"x3"); control via external potentiometer	$116
70 dB S/N	0.05%	Small (approx. 0.5"x1.5"x3"); phantom; fixed gain of 50 dB	$99
75 dB S/N	0.05%	Phantom; small (approx. 0.5"x1.5"x3"); adjustable gain	$136
75 dB S/N	0.05%	Gating via external control; phantom; small (approx. 0.5"x1.5"x3")	$153
70 dB S/N	0.05%	Phantom; small (approx. 0.5"x1.5"x3"); adjustable gain	$156
81 dB S/N	0.001%	Separate EQ and FX BU for each pickup; dual-mono dignal path	$569
97 dB S/N	0.009%	Stereo with pan; phantom	$549
102 dB S/N	0.007%	Phantom	$199
-85 dB, unweighted	0.005%	Record all electric/acoustic instruments direct to tape	$399
N/A	0.03%	48V phantom	$3,500
-129.2 dBu, 20 Hz–20 kHz	N/A	Phantom recessed, optional AC supply ($150)	$1,250
85.6 dBu, A-weighted; 135 dBu EIN	0.175%	Phantom	$999
-121 dBu	0.0001%	Phantom and tube drive	$299
69.5 dB S/N; -129.5 dB EIN	0.002%	Transformerless; phantom; bal/unbal outputs; phase	$799
-84 dBu, 108 dB S/N	0.05%	"Clean" to "saturated" valve sounds; Jensen transformer; +4 dBu/-10 dBV outs. Hi-Z variable impedance	$2,290
95 dB S/N; -128 dB EIN	0.007%	L/R mix output	$299
96 dB S/N; -129 dBu EIN	0.0015%	Class A hybrid	$1,860
96 dB S/N; -110 dBu EIN	0.0115%	Internally balanced	$2,450
96 dB S/N; -134 dBu EIN	0.0015%	Class A hybrid	$1,680
N/A	N/A		$760
N/A	N/A	(2) discrete op amps per ch (990C); Jensen transformers, no caps in signal path	$1,550–$4,250
N/A	N/A	990 discrete op amp; Jensen input transformer; no caps in signal path; optional Jensen JT-11-BMQ output trans	$875–$2,905
N/A	N/A	990 discrete op amp; Jensen input transformer; no caps in signal path; optional Jensen JT-11-BMQ output trans	$920–$3,085
-122 dBu	0.05%	Phantom power; phase reverse; VU meters	$1,599
-132 dB	0.0008%	MS decoder on ch. 1/2; 25-pin D connector ouputs	$2,850
-85 dB	0.2%		$2,395
N/A	0-70 dB		$1,850
>82 dB	0.03%	Mic/Hi-Z impedance selectable	$2,295

SEE PAGE 174 FOR A COMPLETE LISTING OF MANUFACTURERS' CONTACT INFORMATION

By Bobby Owsinski

MAGIC FREQUENCIES

The audio band can effectively be broken down into six distinct ranges, each one having enormous impact on the total sound.

• Sub-Bass—The very low bass between 16 Hz and 60 Hz that encompasses sounds that are often felt more than heard, such as thunder in the distance. These frequencies give the music a sense of power even if they occur infrequently. Too much emphasis on this range makes the music sound muddy.

• Bass—The bass between 60 Hz and 250 Hz contains the fundamental notes of the rhythm section, so EQing this range can change the musical balance, making it fat or thin. Too much boost in this range can make the music sound boomy.

• Low Mids—The midrange between 250 Hz and 2,000 Hz contains the low order harmonics of most musical instruments and can introduce a telephonelike quality to the music if boosted too much. Boosting the 500 Hz to 1,000 Hz octave makes the instruments sound hornlike, while boosting the 1 kHz to 2 kHz octave makes them sound tinny. Excess output in this range can cause listening fatigue.

• High Mids—The upper midrange between 2 kHz and 4 kHz can mask the important speech recognition sounds if boosted, introducing a lisping quality into a voice and making sounds formed with the lips such as "m," "b," and "v" indistinguishable. Too much boost in this range—especially at 3 kHz—can also cause listening fatigue. Dipping the 3 kHz range on instrument backgrounds and slightly peaking 3 kHz on vocals can make the vocals audible without having to decrease the instrumental level in mixes where the voice would otherwise seem buried.

• Presence—The presence range between 4 kHz and 6 kHz is responsible for the clarity and definition of voices and instruments. Boosting this range can make the music seem closer to the listener. Reducing the 5 kHz content of a mix makes the sound more distant and transparent.

• Brilliance—The 6 kHz to 16 kHz range controls the brilliance and clarity of sounds. Too much emphasis in this range, however, can produce sibilance on the vocals. ■

EASY-TO-REMEMBER GOLDEN RULES OF EQ

1. If it sounds muddy, cut some at 250 Hz.
2. If it sounds honky, cut some at 500 Hz.
3. Cut if you're trying to make things sound better.
4. Boost if you're trying to make things sound different.
5. You can't boost something that's not there in the first place.

Here's a chart for those of you who have an easier time visualizing the audio spectrum in one-octave increments.

31 Hz	Rumble, "chest"
63 Hz	Bottom
125 Hz	Boom, thump, warmth
250 Hz	Fullness or mud
500 Hz	Honk
1 kHz	Whack
2 kHz	Crunch
4 kHz	Edge
8 kHz	Sibilance, definition, "ouch!"
16 kHz	Air

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By Bobby Owsinski

THE NEW YORK COMPRESSION TRICK

One of the little tricks that seems to set New York mixers apart from everyone else is something I call the "New York Compression Trick." It seems as though every mixer who has ever mixed in New York City comes away with this maneuver. Even if you don't mix in NYC, you just might find yourself using this trick all the time once you try it, because it is indeed a handy method to use to make a rhythm section rock.

Here's the trick:

1. Bus the drums, and maybe even the bass, to a stereo compressor.
2. Hit the compressor fairly hard, at least 10 dB or more if it sounds good.
3. Return the output of the compressor to a pair of fader inputs on the console.
4. Add a pretty good amount of high end (6–10 dB at 10 kHz or so) and low end (6–10 dB at 100 Hz or so) to the compressed signal.
5. Now bring the fader levels of the compressor up until it's tucked just under the present rhythm section mix to where you can just hear it.

The rhythm section will now sound bigger and more controlled without sounding overly compressed. ■

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MICROPHONES

MANUFACTURER	PRODUCT	TYPE	POLAR PATTERNS	INTERNAL ROLL-OFF	INTERNAL PAD	MAX. SPL
ADK	A-51	Condenser	Cardioid	Yes	N/A	130 dB
ADK	A-51s	Condenser	Cardioid	N/A	N/A	140 dB
ADK	Area 51 Commemorative Edition	Tube condenser	9 patterns	N/A	N/A	125 dB
ADK	A-51SC	Condenser	Cardioid	N/A	N/A	144 dB
ADK	A-51SL	Condenser	Cardioid	N/A	N/A	125 dB
ADK	A-51TC	Tube condenser	Cardioid	N/A	N/A	125 dB
ADK	A-51TL	Condenser	Cardioid; hypercardioid; omni; fig-8	N/A	N/A	135 dB
ADK	A-51TT	Tube condenser	9 patterns	N/A	N/A	125 dB
AKG	C 409	Dynamic	Hypercardioid	N/A	N/A	128 dB
AKG	C 411/C 411 B/C 411 L	Condenser	Figure 8 (vibration pickup)	N/A	N/A	100 dB
AKG	C 414B/TLII	Condenser	Cardioid; hypercardioid; omni; figure-8	75/150 Hz	-10/-20 dB	160 dB
AKG	C 414B/ULS	Condenser	Cardioid; hypercardioid; omni; figure-8	75/150 Hz	-10/-20 dB	160 dB
AKG	C 416/C416 B	Condenser	Hypercardioid	N/A	N/A	130 dB
AKG	C 418/C 418 B	Condenser	Hypercardioid	N/A	N/A	140 dB
AKG	C 419/C 419 B/C 419 L	Condenser	Hypercardioid	N/A	N/A	130 dB
AKG	C 430	Condenser	Cardioid	N/A	N/A	130 dB
AKG	C 451 B	Condenser	Cardioid	75/150 Hz	-10 dB, 0, -20 dB	155 dB
AKG	C 480B-CK 61	Condenser	Cardioid	70/150 Hz	6/0/-10 dB	144 dB
AKG	C 535EB	Condenser	Cardioid	100 Hz	-14 dB	130 dB
AKG	C 900	Condenser	Cardioid	N/A	N/A	142 dB
AKG	C 1000S	Condenser	Cardioid; hypercardioid (with PPC 1000)	N/A	-10 dB	137 dB
AKG	C 2000B	Condenser	Cardioid	500 Hz	-10 dB	140-150 dB
AKG	C 3000 B	Condenser	Cardioid	500 Hz	-10 dB	150 dB
AKG	C 4000 B	Condenser	Omni; cardioid; hypercardioid	100 Hz	-10 dB	155 dB
AKG	CK77 WR	Condenser	Omnidirectional	N/A	N/A	133 dB
AKG	CK 91 (w/SE 300B)	Condenser	Cardioid	75 Hz	-10 dB	142 dB
AKG	D 112	Dynamic	Cardioid	N/A	N/A	N/A
AKG	D 440	Dynamic	Cardioid	N/A	N/A	156 dB
AKG	D 550	Dynamic	Cardioid	N/A	N/A	156 dB
AKG	D 660S	Dynamic	Hypercardioid	N/A	N/A	150 dB
AKG	D 770	Dynamic	Cardioid	N/A	N/A	156 dB
AKG	D 880/D 880S	Dynamic	Supercardioid	N/A	N/A	147/156 dB
AKG	D 3700/D 3700S	Dynamic	Hypercardioid	N/A	N/A	156 dB
AKG	D 3800	Dynamic	Hypercardioid	N/A	N/A	156 dB
AKG	Solid Tube	Condenser	Cardioid	100 Hz	-20 dB	130/145 dB
Audio-Technica	AT815ST	Condenser	Line-cardioid, figure-eight	80 Hz	N/A	127 dB
Audio-Technica	AT822	Condenser	Cardioid stereo	150 Hz	N/A	125 dB
Audio-Technica	AT825	Condenser	Cardioid stereo	150 Hz	N/A	126 dB
Audio-Technica	AT835ST	Condenser	Line-cardioid; figure-eight	80 Hz	N/A	127 dB
Audio-Technica	AT3031	Condenser	Cardioid	80 Hz	-10 dB	148 dB
Audio-Technica	AT3032	Condenser	Omnidirectional	80 Hz	-10 dB	148 dB
Audio-Technica	AT3035	Condenser	Cardioid	80 Hz	-10 db	148 dB
Audio-Technica	AT4041	Condenser	Cardioid	80 Hz	N/A	145 dB
Audio-Technica	AT4047/SV	Condenser	Cardioid	80 Hz	-10 dB	149 dB
Audio-Technica	AT4050/CM5	Condenser	Cardioid, omni; figure-8	80 Hz	-10 dB	149 dB
Audio-Technica	AT4051a	Condenser	Cardioid	80 Hz	N/A	146 dB
Audio-Technica	AT4060	Tube condener	Cardioid	N/A	N/A	150 dB
Audio-Technica	ATM10a	Condenser	Omnidirectional	N/A	N/A	137 dB
Audio-Technica	ATM23HE	Dynamic	Hypercardioid	N/A	N/A	N/A
Audio-Technica	ATM25	Dynamic	Hypercardioid	N/A	N/A	N/A
Audio-Technica	ATM31a	Condenser	Cardioid	N/A	N/A	137 dB
Audio-Technica	ATM33a	Condenser	Cardioid	N/A	N/A	137 dB
Audio-Technica	ATM35	Condenser	Cardioid	150 Hz	N/A	145 dB
Audio-Technica	KP-STUDIO	Condenser	Cardioid	N/A	N/A	128 dB
Audio-Technica	MB4000C	Condenser	Cardioid	N/A	N/A	128 dB
Audio-Technica	PRO 37R	Condenser	Cardioid	N/A	N/A	141 dB

FREQUENCY RESPONSE	SUGGESTED APPLICATIONS	SPECIAL FEATURES	PRICE
20 Hz-20 kHz	Vocals, guitar cabs	Vintage curve	$199
20 Hz-20 kHz	High SPL sources	Vintage curve. Matched pair with silver bodies and deluxe flight case available ($699)	$299
20 Hz-20 kHz	All vintage mic applications	GE N/O stock 6072A tube, special grille, remote polar pattern controller	$1,899
20 Hz-20 kHz	Instruments, hi-hats, drum overheads		$299
20 Hz-20 kHz	Grand piano, trumpet, timpani		$599
20 Hz-20 kHz	Acoustic instruments, vocals, broadcast		$799
20 Hz-20 kHz	Orchestral instruments, strings, choir		$699
20 Hz-20 kHz	Acoustic instruments, vocals, broadcast	Remote polar pattern controller	$1,099
50 Hz-17 kHz	Instrument	Clip-on	$198
10 Hz-18 kHz	Stringed instruments		$ 248/$152/$152
20 Hz-20 kHz	Multipurpose, esp. vocals, strings	Incl. H100 shock-mount	$1,225
20 Hz-20 kHz	Multipurpose studio	Incl. H100 shock-mount	$1,100
20 Hz-20 kHz	Instrument, amplifier	Perm or temp mount	$330-$252
50 Hz-20 kHz	Percussion	Clip-on mount	$330-$252
20 Hz-20 kHz	Horn, brass	Clip-on mount	$330/$252/$252
20 Hz-20 kHz	Instrument; percussion	Low profile	$238
20 Hz-20 kHz	Studio	Comes with indvidual frequency plot	$549
20 Hz-20 kHz	Premium recording		$987
20 Hz-20 kHz	Premium hand-held vocal		$376
20 Hz-20 kHz	Vocals	PB 1000 Presence Boost Adapter provides a 3-4 dB peak between 5 and 13 kHz	$250
50 Hz-20 kHz	Personal studio; field recording; stage	Battery powered option	$312
30 Hz-20 kHz	Personal studio	Incl. H100 shock-mount	$378
20 Hz-20 kHz	Studio; stage	Incl. H100 shock-mount	$520
20 Hz-20 kHz	Studio	Includes H100 shock-mount	$665
20 Hz-20 kHz	Church; theater; broadcast	Water-resistant	$300
20 Hz-20 kHz	General purpose		$462
20 Hz-17 kHz	Bass drums, bass instruments		$338
60 Hz-20 kHz	Instrument		$198
20 Hz-20 kHz	Bass instrument		$238
70 Hz-20 kHz	Vocal	On/off switch	$98
60 Hz-18 kHz; 20 Hz-20 kHz	Vocal; instrument		$129
60 Hz-18 kHz; 20 Hz-20 kHz	Vocal	S version has switch	$142/$155
60 Hz-18 kHz; 20 Hz-18 kHz	Vocal; instrument	On/off switch	$191/$206
60 Hz-18 kHz; 20 Hz-18 kHz	Vocal; instrument		$276
20 Hz-20 kHz	Vocal; acoustic guitar		$1,165
30 Hz-20 kHz	Studio audio acquisition	Carrying case	$999
30 Hz-20 kHz	Stereo recording		$399
30 Hz-20 kHz	Stereo recording	Battery or phantom power	$525
40 Hz-20 kHz	Studio audio acquisition	Carrying case	$899
30 Hz-20 kHz	General purpose		$259
30 Hz-20 kHz	Group vocals, instruments		$259
20 Hz-20 kHz	Vocals; instruments; general purpose		$349
20 Hz-20 kHz	Instruments; acoustic guitar		$395
20 Hz-18 kHz	Vocals; instruments; general purpose	AT8449/SV shock-mount	$695
20 Hz-20 kHz	Vocals; instruments; general purpose	AT8441 shock-mount	$995
20 Hz-20 kHz	Instruments		$700
20 Hz-20 kHz	Vocals; general purpose	AT8560 power supply; AT8447 shock-mount	$1,695
20 Hz-18 kHz	Group vocals; instruments	Battery or phantom power	$210
70 Hz-16 kHz	Snare; toms; instruments		$235
30 Hz-15 kHz	Kick drum; toms		$275
30 Hz-20 kHz	Vocals; general purpose	Battery or phantom power	$250
30 Hz-20 kHz	Instruments; general purpose	Battery or phantom power	$290
30 Hz-20 kHz	Horns; drums; instruments	Battery/phantom power; clip-on mount	$350
100 Hz-18 kHz	Strings; vocals; overheads	2 studio mics; ATH-M3X headphones & case	$300
100 Hz-18 kHz	General purpose	Battery or phantom power	$125
30 Hz-15 kHz	Instrument; general purpose		$175

SEE PAGE 174 FOR A COMPLETE LISTING OF MANUFACTURERS' CONTACT INFORMATION

MICROPHONES

MANUFACTURER	PRODUCT	TYPE	POLAR PATTERNS	INTERNAL ROLL-OFF	INTERNAL PAD	MAX. SPL
Audix	ADX-20-i	Condenser	Cardioid	N/A	N/A	130 dB
Audix	ADX-50	Condenser	Cardioid	N/A	N/A	132 dB
Audix	CX101	Condenser	Cardioid	N/A	N/A	135 dB
Audix	CX111	Condenser	Cardioid	N/A	-10 db	145 dB
Audix	D1	Dynamic	Hypercardioid	N/A	N/A	144 dB
Audix	D2	Dynamic	Hypercardioid	N/A	N/A	144 dB
Audix	D3	Dynamic	Hypercardioid	N/A	N/A	144 dB
Audix	D4	Dynamic	Hypercardioid	N/A	N/A	144 dB
Audix	MD-10	Dynamic	Hypercardioid	N/A	N/A	144 dB
Audix	OM3-xb	Dynamic	Hypercardioid	N/A	N/A	144 dB
Audix	OM5	Dynamic	Hypercardioid	N/A	N/A	144 dB
Audix	OM6	Dynamic	Hypercardioid	N/A	N/A	144 dB
Audix	OM7	Dynamic	Hypercardioid	N/A	N/A	144 dB
Audix	SCX-1	Condenser	Cardioid; hypercardioid; omni	N/A	N/A	128 dB
Audix	SCX-25	Condenser	Cardioid	N/A	N/A	135 dB
Behringer	B-1	Condenser	Cardioid	75 Hz	-10 dB	138 dB
Behringer	ECM8000	N/A	Omnidirectional	N/A	N/A	N/A
Behringer	Ultravoice XM8500	Dynamic	Cardioid	N/A	N/A	N/A
Behringer	XM2000S	Dynamic	Supercardioid	N/A	N/A	N/A
Benson Audio Labs	B2	Condenser PZM	Cardioid	N/A	N/A	141 dB
Benson Audio Labs	BA 30	Dynamic	Cardioid	N/A	N/A	145 dB
Benson Audio Labs	ND 90	Dynamic	Hypercardioid	N/A	N/A	145 dB
beyerdynamic	M-88TG	Dynamic	Hypercardioid	N/A	N/A	120 dB
beyerdynamic	M-130	Dynamic ribbon	Figure-8	N/A	N/A	116 dB
beyerdynamic	M-160	Dynamic ribbon	Hypercardioid	N/A	N/A	116 dB
beyerdynamic	M-201TG	Dynamic	Hypercardioid	N/A	N/A	120 dB
beyerdynamic	MC-740	Condenser	Wide cardioid; cardioid; hypercardioid; omni; figure-8	N/A	-10 dB	134/144 dB
beyerdynamic	MC-834	Condenser	Cardioid	80/160 Hz	-10 dB	130/140/150 dB
beyerdynamic	MCD 100	Digital condenser	Cardioid	Yes	Yes	150 dB
beyerdynamic	MCE-82	Electret condenser	Dual cardioid	120 Hz	N/A	120 dB
beyerdynamic	MCE-83	Electret condenser	Cardioid	N/A	N/A	138 dB
beyerdynamic	MCE-90	Condenser	Cardioid	100 Hz	-15 dB	154 dB
BLUE	Baby Bottle	Condenser	Cardiod	N/A	N/A	133 db
BLUE	Blueberry	Condenser	Cardioid	N/A	N/A	133 dB
BLUE	Cactus	Tube condenser	Cardiod, omni, fig-8, in between	N/A	N/A	130 db
BLUE	The Bottle	Tube condenser	Cardiod; omni; fig-8	N/A	N/A	134 db
BLUE	Dragonfly	Condenser	Cardioid	N/A	N/A	132 dB
BLUE	Dragonfly Deluxe	Condenser	Cardiod	N/A	N/A	133 db
BLUE	Kiwi	Condenser	Cardiod, omni; fig-8 and in between	N/A	N/A	133 dB
BLUE	Mouse	Condenser	Cardioid	N/A	N/A	134 dB
Brauner	Valvet	Tube condenser	Omni; cardioid	N/A	N/A	142 dB
CAD	90/90Ni	Dynamic	Cardioid	N/A	N/A	N/A
CAD	95/95Ni	Condenser	Cardioid	N/A	N/A	130 dB
CAD	E100	Condenser	Supercardioid	80 Hz	-20 dB	148 dB
CAD	E200	Condenser	Cardioid; figure-8; omni	80 Hz	-20 dB	148 dB
CAD	E350	Condenser	Cardioid, figure-8, omni	80 Hz	-20 dB	148 dB
CAD	KBM412	Dynamic	Cardioid	N/A	N/A	N/A
CAD	M-177	Condenser	Cardioid	80 Hz	-20 dB	148 dB
CAD	TSM411	Dynamic	Cardioid	N/A	N/A	N/A

FREQUENCY RESPONSE	SUGGESTED APPLICATIONS	SPECIAL FEATURES	PRICE
40 Hz–20 kHz	Instrument	High-tension spring clamp; flexible gooseneck	$199
40 Hz–18 kHz	Drum overheads; acoustic instr; hi-hat		$289
20 Hz–20 kHz	Vocals, drum overheads, acoustic instr; room	Shock-mount; flight case	$499
20 Hz–20 kHz	Vocals, drum overheads, acoustic instr; room	Shock-mount; flight case	$499
46 Hz–18 kHz	Snare; percussion		$219
44 Hz–18 kHz	Toms, congas, percussion		$219
50 Hz–19 kHz	Snare, timbale, trumpet; electric guitar		$219
38 Hz–19 kHz	Kick drum, acoustic bass; piano; sax		$329
70 Hz–15 kHz	Drum	Easy mounting system	$259
50 Hz–18 kHz	General purpose		$199
48 Hz–19 kHz	Vocals		$299
40 Hz–19 kHz	Vocals		$329
45 Hz–19 kHz	Vocals		$349
20 Hz–20 kHz (omni) 40 Hz–20 kHz (cardioid/hypercardioid)	Acoustic instruments	Interchangeable capsules	$299-$349
20 Hz–20 kHz	Vocals; instrument	Suspension mounting system	$799
20 Hz-20 kHz	Vocal and general use	1" gold-sputered diaphragm	$129
15 Hz–20 kHz		+15V/+48V phant pwr; clip/stand adapter	$43
5 Hz–200 kHz	General purpose	Pop filter; hard case with clip/adapter	$49
50 Hz–15 kHz	Vocals	Pop filter; hard case with clip/adapter	$49
30 Hz–20 kHz	Piano, acoustic instruments, group vocals	Battery or phantom power	$260
50 Hz–15 kHz	Drums; guitar amps, female vocals	Windscreen	$170
50 Hz–18 kHz	Vocals		$350
30 Hz–20 kHz	General purpose		$399
40 Hz–18 kHz	Digital recording, ambient, piano, strings		$750
40 Hz–18 kHz	Stringed instruments, strings		$750
40 Hz–18 kHz	Percussion, drums		$300
20 Hz–20 kHz	Vocals; piano; perc, overhead		$1,899
20 Hz–20 kHz	Vocal, piano, strings, brass, perc, sampling, voice-overs		$999
20 Hz–20 kHz	Studio recording	AES/EBU out (requires MPD 200 power supply)	$2,500
50 Hz–20 kHz	Drum overhead; piano, vocals		$800
50 Hz–18 kHz	Brass, percussion		$300
30 Hz–20 kHz	General purpose		$700
20 Hz-20 kHz	Voice, instrument, general applications	Cherrywood box; blue velvet bag; mic clip	$649
20 Hz-20 kHz	Voice; Acoustic Guitars; Piano	Cherrywood box	$1,299
20 Hz-20 kHz	Voice, winds, brass	Shock/pop kit; ATA flight case; cable, power supply	$3,295
Varies each capsule	Audiophile recording	8 optional Interchangeable capsules, ATA flight case, ships with B6 capsule	$4,995
20 Hz–20 kHz	Voice, Gtr Amps; Drum Overheads	Shock-mount; rotating capsule grill	$1,099
20 Hz-20 kHz	Voice, guitar amps, drum overheads	Cherrywood box; lim prod of 275 units, shock-mount	$1,699
20 Hz–20 kHz	Voice, instruments, ambient	9 patterns, Shock-mount	$2,395
20 Hz–20 kHz	Voice, Bass Amp; Kick Drum	Rotating capsule grill; cherrywood box	$1,699
40 Hz–20 kHz	Reference recording	Lundahl transformer; power supply with remote pattern switch; phase invert; shock mount	$2,700
40 Hz–16 kHz	Vocals; instrument amps		$239
40 Hz–20 kHz	Vocals; instruments; overhead		$239
10 Hz–18 kHz	Vocals; acoustic instruments; amplifiers; overhead; drum kit	6 hours on 2 NiCad batteries	$469
10 Hz–18 kHz	Vocals; orchestra, acoustic instrument; overhead, brass, room monitoring	6 hours on 2 NiCad batteries	$749
10 Hz–20 kHz	Vocals, v/o, acoustic instruments, overhead and room monitoring	6 hours on 2 NiCad batteries	$899
30 Hz–15 kHz	Bass drum, other low frequency sources		$149
10 Hz-20 kHz	Vocals, acoustic and amplified instruments; overhead	High-speed; low noise, discrete power supply circuit	$249
50 Hz–15 kHz	Snare; toms; percussion instruments; amp miking		$99

SEE PAGE 174 FOR A COMPLETE LISTING OF MANUFACTURERS' CONTACT INFORMATION

MICROPHONES

MANUFACTURER	PRODUCT	TYPE	POLAR PATTERNS	INTERNAL ROLL-OFF	INTERNAL PAD	MAX. SPL
CAD	VSM1	Single-valve condenser	Cardioid	80 Hz	-8/-16 dB	149 dB
CAD	VX2	Dual-valve condenser	Cardioid; figure-8; omni	80 Hz	-8/-16 dB	145 dB
Carvin	CM30D	Dynamics x 3	Cardioid	75 Hz	N/A	140 dB
Carvin	CM50	Dynamic	Cardioid	N/A	N/A	N/A
Carvin	CM67	Dynamic	Cardioid	N/A	N/A	N/A
Carvin	CM68	Dynamic	Cardioid	N/A	N/A	N/A
Carvin	CM87S	Condenser	Cardioid	40/80 Hz,	-6dB/-10dB	145 dB
Carvin	CM90E	Condenser	Cardioid	N/A	N/A	132 dB
Carvin	CM98ST	Tube condenser	9 patterns	120 Hz	10 dB	133 dB
Coles	4038	Ribbon	Figure-8	N/A	N/A	125 dB/150 dB
Coles	4104	Ribbon	Figure-8	50 Hz	N/A	120 dB
Countryman	Isomax Headset Microphone	Condenser	Hypercardioid; cardioid	N/A	N/A	150 dB
Countryman	Isomax II	Condenser	Hypercardioid; cardioid; omni; bidirectional	N/A	N/A	150 dB
Crown	CM-150	Condenser	Omnidirectional	N/A	N/A	130 dB
Crown	CM-700	Condenser	Cardioid	80/150 Hz	N/A	151 dB
Crown	PZM 6D	PZM	Hemispherical	N/A	N/A	150 dB
Crown	SASS-PMKII	Condenser	Stereo PZM	100 Hz	N/A	150 dB
DPA	3541 Kit for Soloist	Condenser	Omni	N/A	N/A	144 dB
DPA	4006	Condenser	Omni	N/A	N/A	154 dB
DPA	4007	Pre-polarized condenser	Omnidirectional	N/A	N/A	155 dB
DPA	4011	Condenser	Cardiod	N/A	N/A	158 dB
DPA	4041 S	Condenser	Omni	N/A	N/A	144 dB
DPA	4060	Pre-polarized condenser	Omnidirectional	N/A	N/A	134 dB
DPA	4065	Pre-polarized condenser	Omnidirectional	N/A	N/A	144 dB
Earthworks	Flex Series	Condenser	Cardioid	N/A	N/A	145 dB
Earthworks	M30BX	Condenser	Omni	N/A	N/A	132 dB
Earthworks	QTC1	Condenser	Omnidirectional	N/A	N/A	142 dB
Earthworks	SR68	Condenser	Hypercardioid	N/A	N/A	145 dB
Earthworks	SR69	Condenser	Cardioid	N/A	N/A	145 dB
Earthworks	SR77	Condenser	Cardioid	N/A	N/A	145 dB
Earthworks	SR78	Condenser	Hypercardioid	N/A	N/A	145 dB
Earthworks	SR0	Condenser	Omni	N/A	N/A	150 dB
Earthworks	TC-30K	Condenser	Omni	N/A	N/A	150 dB
Electro-Voice	N/D167	Dynamic	Cardioid	N/A	N/A	145 dB
Electro-Voice	N/D267a; N/D267as	Dynamic	Cardioid	N/A	N/A	154 dB
Electro-Voice	N/D468	Dynamic	Supercardioid	N/A	N/A	158 dB
Electro-Voice	N/D478	Dynamic	Cardioid	N/A	N/A	154 dB
Electro-Voice	N/D767a	Dynamic	Supercardioid	Yes	N/A	158 dB
Electro-Voice	N/D868	Dynamic	Cardioid	N/A	N/A	157 dB
Electro-Voice	RE20	Dynamic	Cardioid	80 Hz	N/A	148 dB
Electro-Voice	RE200	Condenser	Cardioid	N/A	N/A	130 dB
Electro-Voice	RE1000	Condenser	Supercardioid	N/A	N/A	130 dB
Fostex	321	Dynamic	Cardioid	N/A	N/A	N/A
Fostex	521	Dynamic	Cardioid	N/A	N/A	N/A
Fostex	M11-RP	Printed ribbon	Cardioid	3-position filter	-10 dB	N/A
Fostex	M88-RP	Printed ribbon	Bi-directional	3-position filter	-10 dB	N/A
Generis	GC-1	Condenser	Cardioid	N/A	Yes	130 dB
Generis	GC-2	Condenser	Cardioid	N/A	N/A	140 dB
Generis	GC-2 Dual	Condenser	9 patterns	N/A	N/A	125 dB

FREQUENCY RESPONSE	SUGGESTED APPLICATIONS	SPECIAL FEATURES	PRICE
10 Hz–20 kHz	Vocals; strings; guitar	Suspension mount	$1,099
10 Hz–20 kHz	All recording applications	Interchangeable capsule/head screen assembly	$2,249
30 Hz–15 kHz	Drums	Set of 3 with case; adjustable stand mount	$140
50 Hz–14 kHz	Vocals	On/off switch	$50
40 Hz–15 kHz	Vocals		$90
45 Hz–15 kHz	Vocals		$90
30 Hz–20 kHz	Instrument; amp; vocal	Adjustable shock mount	$220
30 Hz–20 kHz	General purpose	Battery or phantom power	$115
20 Hz–20 kHz	Instrument; amp; vocal	Suspension mount; flight case; power supply	$500
30 Hz–15 kHz	Drum overheads; sax; string instruments; brass; voice; electric guitar; bass	Custom rigid mic mount	$1,135
60 Hz–12 kHz	On-location, high noise environment	Lip bar for flat voice response	$700
20 Hz–20 kHz	Vocals	Phantom version has pop-free switch	$308
Isomax II H, C, B: 50 Hz–20 kHz/Isomax II O: 20 Hz–20 kHz	General instrument/SR and exotic (acoustical measurements)	Miniature size; opt 18V battery power module	$279
20 Hz–20 kHz	General purpose; acoustical measurement applications		$899
30 Hz–20 kHz	Drums; brass; strings; guitar		$299
20 Hz–20 kHz	Piano; overhead; conference table		$349
20 Hz–20 kHz	Orchestra;church ensemble; marching band		$995
10 Hz-20 kHz	Soloist recording	High sensitivity; low noise	$5,000
10 Hz-20 kHz	General recording	Low noise	$1,650
20 Hz–40 kHz	Close-miking drums; percussion; brass		$1,650
40 Hz-20 kHz	Live; general recording	Very low distortion	$1,850
10 Hz-20 kHz	Soloist recording	High sensitivity; low noise	$3,040
20 Hz–20 kHz	General purpose	5.4 mm size	$400
20 Hz–20 kHz	Theater; stage; broadcast	5.4 mm size	$475
50 Hz–20 kHz	General purpose	Flexible performance lengths: 360, 500, 720 mm	$400
9 Hz–25 kHz	Field recording; sound effects; measurement	14 dB of gain available; low handling noise	$600
4 Hz–40 kHz	Classical location recording	Time-coherent sound; matched pair ($2,100)	$1,000
50 Hz–20 kHz	General purpose	Red, black or silver finish	$565
50 Hz–20 kHz	Stage vocals	Red, black or silver finish	$515
30 Hz–30 kHz	Voice; guitar; drums; concert tapers	Excellent rejection; matched pair ($1,500)	$700
30 Hz–30 kHz	snare spot; location film; Foley	Optional windscreen; matched pair ($1,650)	$775
10 Hz–20 kHz	Sound reinforcement omni; guitar amp	Boxed set available	$385
9 Hz–30 kHz	Drums; guitar; bass; room; location recording of loud sources	Matched pair ($1,200)	$550
50 Hz–12 kHz	Vocals	Warm grip handle	$132
45 Hz–15 kHz	Vocals	Stand clamp; gig bag; warm grip handle; vocal optimized bass response	$180/$190
30 Hz–22 kHz	Instruments	Flex pivoting yoke; gig bag	$334
45 Hz–15 kHz	Vocals; instruments	Warm grip handle; vocal optimized bass response	$180
35 Hz–22 kHz	Lead vocals	Shock-mount; gig bag; vocal optimized bass response	$252
20 Hz –10 kHz	Kick drum		$372
45 Hz–18 kHz	Bass; drum; vocal; upright bass; toms; electric guitars	Variable-D design	$798
50 Hz–18 kHz	Percussion; strings; brass; choir	Small; stand clamp; windscreen	$314
70 Hz–18 kHz	General recording	Phantom power; 2-stage pop filter	$698
90 Hz–16 kHz	Vocals		$59
60 Hz–16 kHz	Vocals		$79
40 Hz-18 kHz	Instrument; vocal	No phantom power needed	$1,199
40 Hz-18 kHz	Instrument; ensemble	No phantom power needed	$1,399
20 Hz-20 kHz	Vocals; guitar; sax		$99
20 Hz-20 kHz	High SPL instruments		$149
20 Hz-20 kHz	Vocals; acoustic instruments		$599

SEE PAGE 174 FOR A COMPLETE LISTING OF MANUFACTURERS' CONTACT INFORMATION

MICROPHONES

MANUFACTURER	PRODUCT	TYPE	POLAR PATTERNS	INTERNAL ROLL-OFF	INTERNAL PAD	MAX. SPL
Generis	GS-1	Condenser	Cardioid	N/A	N/A	130 dB
Groove Tubes	GT 33	FET condenser	Cardiod (interchangable capsule)	75 Hz	-15 dB	150 dB
Groove Tubes	GT 44	Tube condenser	Cardiod (interchangable capsule)	75 Hz	-15 dB	145 dB
Groove Tubes	AM11	Condenser	Cardioid	75 Hz	-10 dB	144 dB
Groove Tubes	AM40	Condenser	Cardioid	75 Hz	-15 dB	145 dB
Groove Tubes	GT 57	FET condenser	Omni; figure-8; cardiod	75 Hz	-10 dB	148 dB
Groove Tubes	GT 67	Tube condenser	Cardiod; supercardiod; omni; figure-8	75 Hz	-15 dB	130 dB
Independent Audio	Coles 4040	Ribbon	Figure-8	N/A	N/A	N/A
Independent Audio	OKM CX	Electric	Omni	120 Hz	20 dB	125 dB
Independent Audio	OKM PX	Electric	Omni	120 Hz	20 dB	135 dB
Independent Audio	OKM RX	Electric	Omni	120 Hz	20 dB	145 dB
Independent Audio	OKM SX	Electric	Omni	N/A	N/A	125 dB
K&K Sound	CXM 5 Saxophone Mic	Condenser (clip-on)	Cardioid (soft)	N/A	N/A	140 dB
K&K Sound	Golden Bullet	Condenser (clip-on)	Hyperunidirectional	N/A	N/A	140 dB
K&K Sound	Silver Bullet	Condenser (clip-on)	Cardioid (soft)	N/A	N/A	135 dB
Langevin	CR-2001	FET condenser	Cardioid	100 Hz	-10 dB	132 dB
Lawson	L47MP	Tube condenser	Omni; cardioid; figure-8	N/A	-10 dB	138 dB
Lawson	L47SH	Condenser	Cardioid	100 Hz	-10 dB/-20 dB	165 dB
Manley Labs	Reference Cardioid	Condenser	Cardioid	N/A	-10 dB	140 dB
Manley Labs	Reference Gold	Condenser	Omni; figure-8; cardioid	N/A	-10 dB	150 dB
Manley Labs	Stereo Gold	Condenser	Omni; figure-8; cardioid	N/A	-10 dB	150 dB
Marshall Electronics	MXL 600	Condenser	Cardioid	N/A	N/A	134 dB
Marshall Electronics	MXL V67 Gold	Condenser	Cardioid	N/A	N/A	130 dB
Marshall Electronics	MXL V77S Tube	Tube condenser	Cardioid	N/A	N/A	122 dB
Marshall Electronics	MXL 1006	Condenser	Cardioid	N/A	N/A	130 dB
Marshall Electronics	MXL 2001-P	Condenser	Cardioid	N/A	N/A	130 dB
Marshall Electronics	MXL 2003	Condenser	Cardioid	150 Hz	-10 dB	140 dB
MBHO - MTC	MBNM-410	Condenser	Omni	N/A	N/A	126 dB
MBHO - MTC	MBNM-440	Condenser	Cardioid	N/A	N/A	126 dB
MBHO - MTC	MBNM-540 EL	Measurement	Omni	N/A	N/A	128 dB
MBHO - MTC	MBNM-550 EL	Condenser	Omni	N/A	N/A	128 dB
MBHO - MTC	MBNM-608	Condenser	Omni, cardioid; figure-8	N/A	N/A	133 dB
MBHO - MTC	MBNM-622	Electret condenser	Omni	N/A	N/A	130 dB
MBHO - MTC	MBNM-630	Condenser PZM	Half cardioid/axial	N/A	N/A	130 dB
MBHO - MTC	MBP-603 Mic Body	Condenser	Separate capsules	N/A	N/A	Various
MicroTech Gefell	M300	Condenser	Cardioid	N/A	N/A	135 dB
MicroTech Gefell	M930	Condenser	Cardioid	N/A	N/A	N/A
MicroTech Gefell	MT 711S	Condenser	Cardioid	90 Hz	-10 dB	144 dB
MicroTech Gefell	UMT 70S	Condenser	Cardioid; omni; figure-8	90 Hz	-10 dB	149 dB
Neumann	KM 120	Condenser	Figure-8	N/A	-10 dB	138 dB; (w/pad)148 dB
Neumann	KM 130	Condenser	Omni	N/A	-10 dB	140 dB; (w/pad) 150 dB
Neumann	KM 140	Condenser	Cardioid	N/A	-10 dB	138 dB; (w/pad) 148 dB
Neumann	KM 150	Condenser	Hyper-cardioid	Omni	+10 dB	152 dB
Neumann	KM 183	Condenser	Omni	N/A	N/A	140 dB
Neumann	KM 184	Condenser	Cardioid	N/A	N/A	138 dB
Neumann	KM 185	Condenser	Hypercardioid	N/A	N/A	142 dB
Neumann	KMS 105	Condenser	Supercardioid	120 Hz	N/A	150 dB
Neumann	M 147 Tube	Condenser	Cardioid	N/A	N/A	114 dB

FREQUENCY RESPONSE	SUGGESTED APPLICATIONS	SPECIAL FEATURES	PRICE
30 Hz-20 kHz	Instruments		$89
20 Hz-18 kHz	Instrument; amplifier	Allows for multiple patterns on same mic	$599
20 Hz-20 kHz	Instrument; amplifier	Interchangable capsule allows multiple patterns with same mic	$999
20 Hz–18 kHz	Vocal; instruments	Hard-mount; case	$499
20 Hz–20 kHz	Instrument; percussion; vocal	Hard-mount; power supply; case	$999
20 Hz-18 kHz	Vocals		$799
20 Hz-20 kHz	Vocals		$1,299
20 Hz-20 kHz	Instrument; vocal	Permanent	TBA
20 Hz-20 kHz	All applications		$225
20 Hz-20 kHz	All applications		$283
20 Hz-20 kHz	All applications		$300
20 Hz-20 kHz	All applications		$130
20 Hz-20 kHz	Saxophone; trumpet; trombone	Beltclamp preamp with active XLR output	$235
20 Hz-18 kHz	Hand drums; acoustic bass	Beltclamp preamp with active XLR output	$181
20 Hz-20 kHz	Flute; mandolin; Udu drums	Special flute clip; beltclamp preamp with active XLR output	$149
40 Hz–16 kHz	General purpose	Shock-mount; hard mount; wind screen; case	$800
20 Hz–20 kHz	Vocals; acoustic guitar; strings; piano; choir; orchestra; sax	30' cable; case; 5-year warranty; variable patterns; cardioid only switch	$1,995
20 Hz–20 kHz	High-intensity, esp. bass drum	Case; 5-year warranty	$995
Yes	Vocals; guitars	Shock mount; carrying case; dedicated PSU	$3,000
N/A	General purpose	Shock mount; carrying case; dedicated PSU	$5,500
Yes	Everything	Shock mount; swivel carrying case; dedicated PSU	$8,000
30 Hz–20 kHz	Instrument; acoustic; overhead; percussion	Mic stand adapter	$199
30 Hz–20 kHz	Vocals; brass; overheads; percussion	Mic stand adapter	$210
20 Hz–20 kHz	Vocals, strings, piano, orchestra; acoustic	3-micron diaphragm; shock-mount; wind screen	$349
30 Hz–20 kHz	Vocal; overheads; drums; amplifier	Mic stand adapter	$99
30 Hz–20 kHz	Vocal; overheads; drums; amplifier	Mic stand adapter	$155
20 Hz–23 kHz	Vocals; piano; acoustic, high spl; strings	3-micron diaphragm, shock-mount	$149
15 Hz–20 kHz	Overhead; drums; choir; acoustic guitar; percussion	Short external routings with MBHO's SMD technology	$369
40 Hz–20 kHz	Overhead; choir; acoustic guitar; percussion		$439
20 Hz–20 kHz	Drum overhead, measurement; percussion; guitar	Clean impulse response; low handling noise	$299
10 Hz–20 kHz	Measurements; percussion; overhead; acoustic guitar	Neutral frequency response	$510
5 Hz–20 kHz	Voice recording, piano; acoustic bass; acoustic guitar	Vintage design with double diaphragm, $1,355 gold-sputtered capsule and brass back plate	
10 Hz–26 kHz	Stereo recordings; ambience; drums	Pressure zone; 2 condenser cartridges	$572
20 Hz–20 kHz	Bass drum; as a directed pressure zone mic; broadcast	Nextel finish	$792
Various		Uses capsules: KA-100 ($249), KA-200 ($249), KA-1000 ($764)	$390
40 Hz–18 kHz	Drums; guitar; chorus	Small capsule	$495
N/A	Vocal; drums; acoustic instruments		$795
40 Hz–18 kHz	Vocals	Cable; windscreen; stand-mount	$795
40 Hz–18 kHz	General purpose	Cable; windscreen; stand-mount	$1,100
20 Hz–20 kHz	One of stereo pair for midside/Blumlein recording		$1,275
20 Hz–20 kHz	Room; strings; piano; choir		$1,060
20 Hz–20 kHz	Acoustic guitar; overheads; piano; hi-hat; percussion; orchestra		$1,060
20 Hz-20 kHz	XY stereo pair, instrument; speech	Standmount SG21/17	$1,275
20 Hz–20 kHz	Room; piano; overheads; sampling; strings	16 dB (A) self noise	$749
20 Hz–20 kHz	Acoustic guitar; overheads; hi-hat; strings; perc; piano	16 dB (A) self noise; available in stereo pairs	$729
20 Hz–20 kHz	Hi-hat; acoustic guitar; drums; percussion	18 dB (A) self noise	$749
20 Hz–20 kHz	Vocals; broadcast; home studio		$595
20 Hz-20 kHz	Vocals; instrument	EA1 shockmount; S57 stand-mount	$1,995

SEE PAGE 174 FOR A COMPLETE LISTING OF MANUFACTURERS' CONTACT INFORMATION

MICROPHONES

MANUFACTURER	PRODUCT	TYPE	POLAR PATTERNS	INTERNAL ROLL-OFF	INTERNAL PAD	MAX. SPL
Neumann	TLM 103	Condenser	Cardioid	N/A	N/A	138 dB
Neumann	TLM 193	Condenser	Cardioid	N/A	N/A	140 dB
Pearl Labs	CC22	Condenser	Cardioid	N/A	N/A	126 dB
Pearl Labs	MS8 Stereo	Condenser	Cardioid; figure-8	N/A	N/A	130 dB
Pearl Labs	TL66	Condenser	Cardioid; omni	N/A	N/A	132 dB
Pearl Labs	TLC 90	Condenser	Cardioid	N/A	N/A	144 dB
Peavey	PVM 22	Dynamic	Cardioid	N/A	N/A	140 dB
Peavey	PVM 46	Dynamic	Hypercardioid	N/A	N/A	140 dB
Peavey	PVM 480	Condenser	Super cardioid	N/A	N/A	128 dB
Peavey	Studio Pro M1	Condenser	Cardioid	150 Hz	-10 dB	140 dB
Peavey	Studio Pro M2	Condenser	Cardioid; figure 8; omni	150 Hz	-10 dB	145 dB
Røde	Classic II	Condenser	Switchable in nine steps	Dual	-10 dB and -20 dB	131 dB
Røde	NT1	Condenser	Cardioid	N/A	N/A	128 dB
Røde	NT2	Condenser	Cardioid; omni	150 Hz	-10 dB	130 dB
Røde	NT3	Condenser	Hypercardioid	N/A	N/A	140 dB
Røde	NT1000	Valve condenser	Cardioid	N/A	N/A	140 dB
Røde	NTK	Valve condenser	Cardioid	N/A	N/A	158 dB
Roland	DR-10	Dynamic	Hypercardioid	N/A	N/A	130 dB
Roland	DR-20	Dynamic	Hypercardioid	N/A	N/A	130 dB
Royer Labs	R-121	Ribbon	Figure-8	N/A	N/A	>135 dB
Royer Labs	R-122	Electrodynamic ribbon	Figure-8	N/A	N/A	>135 dB
Royer Labs	SF-1	Ribbon	Figure-8	N/A	N/A	130 dB
Royer Labs	SF-12 Stereo	Ribbon	Figure-8	N/A	N/A	130 dB
Samson	Q1	Condenser	Cardioid	N/A	N/A	134 dB
Samson	Q2	Dynamic	Cardioid	Switchable	Switchable	137 dB
Samson	Q3	Dynamic	Hypercardioid	Switchable	Switchable	137 dB
Samson	Q Mic	Dynamic	Hypercardioid	N/A	N/A	137 dB
Samson	S11	Dynamic	Cardioid	N/A	N/A	130 dB
Samson	S12	Dynamic	Hypercardioid	N/A	N/A	130 dB
Sanken	C4 41	Double condenser	Cardioid	N/A	N/A	140 dB
Sanken	CS-3	Condenser	Supercardioid	N/A	N/A	120 dB
Sanken	CU-31	Condenser	Cardioid	N/A	N/A	148 dB
Schoeps	CCM 4	Condenser	Cardioid	N/A	N/A	132 dB
Schoeps	CCM4V Lg	Condenser	Cardioid, lateral pickup	N/A	N/A	132 dB
Schoeps	CMBI	Condenser	Cardioid, omni; figure-8	N/A	-15 dB	132 dB
Schoeps	CMC64 (U.S. Set)	Condenser	Cardioid	N/A	N/A	132 dB
Schoeps	CMC64 ST (U.S. Stereo)	Condenser	(2) cardioid	N/A	N/A	132 dB
Schoeps	CMXY 4V-X/Y Stereo	Condenser	(2) cardioid	N/A	N/A	132 dB
Schoeps	M222 Tube	Tube	All available	150 Hz	10 dB	Capsule specific
Sennheiser	835	Dynamic	Cardioid	N/A	N/A	150 dB
Sennheiser	845	Dynamic	Supercardioid	N/A	N/A	150 dB
Sennheiser	855	Dynamic	Supercardioid	N/A	N/A	150 dB
Sennheiser	865	Electret condenser	Supercardioid	N/A	N/A	150 dB
Sennheiser	E 602	Dynamic	Cardioid	N/A	N/A	160 dB
Sennheiser	E 604	Dynamic	Cardioid	N/A	N/A	160 dB
Sennheiser	E 609	Dynamic	Cardioid	N/A	N/A	150 dB
Sennheiser	MD 421 II	Dynamic	Cardioid	N/A	N/A	160 dB
Sennheiser	ME 64/K 6	Electret condenser	Cardioid	120 Hz	N/A	130 dB
Shure	Beta 52	Dynamic	Supercardioid	N/A	N/A	174 dB

FREQUENCY RESPONSE	SUGGESTED APPLICATIONS	SPECIAL FEATURES	PRICE
20 Hz–20 kHz	Vocals; acoustic guitar; strings; Foley; acoustic bass; piano	7 dB (A) self noise; available in stereo pairs	$995
20 Hz–20 kHz	Vocals; drum overheads; acoustic guitar; strings; sax; percussion; piano	Available in stereo pairs	$1,195
20 Hz–25 kHz	Vocals; instruments	Dual membrane	$950
29 Hz–25 kHz	TV; video; film		$1,500
20 Hz–20 kHz	Percussion		$500
20 Hz–20 kHz	Vocal		$475
50 Hz–16 kHz	Vocals; instruments		$170
45 Hz–16 kHz	Vocals; instrument miking	Diamond-coated diaphram	$200
40 Hz–20 kHz	Vocals; acoustic instruments; hi-hats; overhead cymbals		$300
30 Hz–20 kHz	Vocals; instruments	Optional shockmount	$250
30 Hz–20 kHz	Vocals; instruments	Optional shockmount	$370
20 Hz–20 kHz	Vocals; instruments; general purpose	6072 twin triode; Jensen transformer; shockmount; flight case	$1,999
20 Hz–20 kHz	General purpose; vocals; guitar	Pop filter; internal shockmount	$349
20 Hz–20 kHz	Vocals; acoustic guitar; woodwinds; piano; overheads	Dual pressure-gradient transducer	$649
20 Hz–20 kHz	Instruments; drums; location	Internal shockmount; transformerless output; battery or phant powered	$199
20 Hz–20 kHz	Vocal; instrumental	Transformerless circuitry	$599
20 Hz–20 kHz	Vocal; instrumental	Hand selected; graded twin triode valve	$999
60 Hz–15 kHz	General purpose	On/off switch; wind screen; case	$95
60 Hz–15 kHz	General purpose	On/off switch; wind screen; case	$150
30 Hz–15 kHz	General purpose	High SPL handling; lifetime warranty; natural tone and feel; low self noise	$1,195
30 Hz-15 kHz	General purpose studio recording	Phantom powered active electronics	$1,695
30 Hz–15 kHz	Strings; acoustic instruments; piano; woodwinds; flute; vocals	Lifetime warranty; extremely low self noise; high SPL handling	$1,395
30 Hz–15 kHz	Single-point stereo recordings	X-Y and M-S recording; high SPL handling; lifetime warranty; low self noise	$2,495
50 Hz–20 kHz	Project studio vocals		$400
50 Hz–15 kHz	Vocal; instruments	Gold-plated XLR; case; clip; Eurometric adapter	$150
50 Hz–15 kHz	Drums; instruments	Gold-plated XLR; case; clip; Eurometric adapter	$225
20 Hz–18.5 kHz	Vocals		$200
60 Hz–18 kHz	Vocals	Case; clip	$100
60 Hz–18 kHz	Vocals	Case; clip	$150
20 Hz-20 kHz	Vocals; instruments	Dual titanium diaphragm	$2,695
60 Hz–20 kHz	Location & studio recording		$1,350
20 Hz–18 kHz	High-pressure sources; brass; drums	Right-angle version available	$699
18 Hz–22 kHz		15' cable	$1,470
40 Hz-20 kHz	All critical recording	Miniature	$1,355
18 Hz–22 kHz	Portable recording	Internal battery; 15' cable	$1,190
40 Hz-20 kHz	All critical recording	Includes CMC64 microphone; SG20 mount; B5 popscreen; custom wood box	$875
40 Hz-20 kHz	All critical recording	Includes 2 ea: CMC64, A20 suspension; B5 popscreen; custom wood box	$1,845
40 Hz-20 kHz	All critical recording	Elegant and unobtrusive	$2,985
Capsule specific	All critical recording	Choice of 20 MK capsules must be ordered separately	$1,435
10 Hz-16 kHz	Vocal; all around	Comes with mic clip and pouch	$159
40 Hz-16 kHz	Vocals	Comes with mic clip and pouch	$229
40 Hz-18 kHz	Vocals	Comes with mic clip and pouch	$299
40 Hz-20 kHz	Vocals	Phantom 48V powered	$399
20 Hz–16 kHz	Bass drums; bass guitar cabs; tuba	Glass-composite housing	$319
40 Hz–18 kHz	Drums (esp toms & snares)	Glass-composite housing	$249
40 Hz–18 kHz	Guitar amp	Glass-composite housing	$349
30 Hz–17 kHz	Drums; vocals; guitar; amps	5-position low-frequency rolloff switch	$485
40 Hz–20 kHz	Acoustic guitar; drum overhead	Interchangeable capsules	$515
20 Hz–10 kHz	Kick drum; bass amp; acoustic bass	Bass instruments	$337

SEE PAGE 174 FOR A COMPLETE LISTING OF MANUFACTURERS' CONTACT INFORMATION

MICROPHONES

MANUFACTURER	PRODUCT	TYPE	POLAR PATTERNS	INTERNAL ROLL-OFF	INTERNAL PAD	MAX. SPL
Shure	Beta 87A	Condenser	Supercardioid	N/A	N/A	142 dB
Shure	Beta 87C	Condenser	Cardioid	N/A	N/A	142 db
Shure	BG4.1	Condenser	Cardioid	N/A	N/A	131 dB
Shure	KSM27/SL	Condenser	Cardioid	Switchable: flat; 18 dB cut; 6 dB roll	-15 dB	138 (153) dB (ATT on)
Shure	KSM32/SL	Condenser	Cardioid	Switchable	-15 dB	139 dB
Shure	KSM44	Condenser	Cardioid; omni; bidirectional	115 Hz	15 dB	156 dB
Shure	SM7B	Dynamic	Cardioid	N/A	N/A	N/A
Shure	SM57	Dynamic	Cardioid	N/A	N/A	N/A
Shure	SM58	Dynamic	Cardioid	N/A	N/A	N/A
Shure	SM81	Condenser	Cardioid	80/100 Hz	-10 dB	146/136 dB
Shure	SM94	Condenser	Cardioid	N/A	N/A	141 dB
Shure	VP88	Stereo condenser	Mid: cardioid; side, bidirectional	80 Hz	N/A	129 dB
Sony	C48	Condenser	Unidirectional; omni; bidirectional	Yes	-10 dB	128 dB
Sony	ECM-23F3PR	Electret condenser	Unidirectional	Yes	N/A	134 dB
Sony	ECM-MS5	Electret condenser	Variable (stereo)	Yes	N/A	130 dB
Sony	ECM-MS957	Stereo condenser	m-s, x-y	N/A	N/A	115 dB
Sony	F740/9X	Dynamic	Unidirectional	N/A	N/A	N/A
Sony	F780/9X	Dynamic	Unidirectional	N/A	N/A	N/A
Soundelux	U99	Tube	Continuously variable	N/A	N/A	126 dB
Soundelux	U195	Condenser (FET)	Cardioid	80 Hz	10 dB	125 dB
Stedman	C15	Condenser	Cardioid	N/A	N/A	132 dB
Stedman	LD23	Dynamic	Supercardioid	N/A	N/A	157 dB
Stedman	LD50	Dynamic	Supercardioid	N/A	N/A	152 dB
Stedman	Transonic-TR1	Dynamic	Cardioid	80 Hz	N/A	152 dB
Studiomaster	KM-81	Dynamic	Cardioid	N/A	N/A	119 dB
Studio Projects	B1	Condenser	Cardioid	N/A	N/A	136 dB
Studio Projects	B3	Condenser	Cardioid; omni; figure-8	150 Hz	-10 dB	136 dB
Studio Projects	C1	Condenser	Cardioid	150 Hz	10 dB	131 dB
Studio Projects	C3	Multi-pattern condenser	Cardioid; omni; figure 8	150 Hz	-10 dB	142 dB
Studio Projects	T3	6072 dual triode	Cardioid; omni; figure 8	N/A	N/A	125 dB
Studio Projects	TB1	Tube	Cardioid	N/A	N/A	136 dB
Yorkville Sound	Apex 110	Electret condenser	Hypercardioid	N/A	N/A	140 dB
Yorkville Sound	Apex 120	Dynamic	Hypercardioid	N/A	N/A	130 dB
Yorkville Sound	Apex 130	Electret condenser	Semicardioid	N/A	N/A	130 dB
Yorkville Sound	Apex 150	Electret condenser	Cardioid	N/A	N/A	130 dB
Yorkville Sound	Apex 165	Electret condenser	Cardioid	N/A	N/A	135 dB
Yorkville Sound	Apex 170	Electret condenser	Cardioid	N/A	N/A	115 dB
Yorkville Sound	Apex 190	Electret condenser	Cardioid	N/A	N/A	135 dB
Yorkville Sound	Apex 191	Condenser	Cardioid	N/A	N/A	115 dB
Yorkville Sound	Apex 350	Dynamic	Cardioid	N/A	N/A	N/A
Yorkville Sound	Apex 380	Dynamic	Cardioid	N/A	N/A	N/A
Yorkville Sound	Apex 410	Condenser	Cardioid	60 Hz/120 Hz	-10 dB	130 dB
Yorkville Sound	Apex 420	Condenser	Cardioid; omnidirectional	100 Hz	N/A	130 dB
Yorkville Sound	Apex 430	Condenser	Cardioid	100 Hz	N/A	130 dB
Yorkville Sound	Apex 450	Tube condenser	9 patterns	120 Hz	-10 dB	125 dB
Yorkville Sound	Apex 750	Dynamic	Cardioid	N/A	N/A	N/A
Yorkville Sound	Apex 770	Dynamic	Cardioid	N/A	N/A	N/A
Yorkville Sound	Apex 850	Dynamic	Cardioid	N/A	N/A	N/A
Yorkville Sound	Apex 880	Dynamic	Hypercardioid	N/A	N/A	130 dB
Yorkville Sound	Apex 950	Dynamic	Cardioid	N/A	N/A	N/A

FREQUENCY RESPONSE	SUGGESTED APPLICATIONS	SPECIAL FEATURES	PRICE
50 Hz–18 kHz	Vocals; live; studio	High gain before feedback	$463
50 Hz–20 kHz	Vocal		$463
40 Hz–18 kHz	Guitar; cymbals; strings; vocals; piano	Battery or phantom power	$292
20 Hz-20 kHz	Vocals; instrument; amp	Includes shock mount	$575
20 Hz–20 kHz	Vocal; instrument	Shock-mount; case	$1,070
20 Hz–20 kHz	Vocals	Shurelock swivel mount or elastic shock mount	$1,394
50 Hz–20 kHz	Vocals; bass amp		$620
40 Hz–15 kHz	Guitar amp; drums; guitar; vocals		$146
50 Hz–15 kHz	General purpose		$188
20 Hz–20 kHz	Guitar; cymbals; strings; vocals; piano		$562
40 Hz–16 kHz	Guitar; cymbals; strings; vocals; piano	Battery or phantom power	$297
40 Hz–20 kHz	Single-point stereo	Internal matrix or MS out	$1,267
30 Hz–16 kHz	Vocals; guitar	48V phantom or 9V internal battery	$1,550
20 Hz–20 kHz	Instrument; vocal	Off switch	$295
70 Hz–20 kHz	Stereo recording of live performances and ambient sounds	Phantom power	$1,550
50 Hz–18 kHz	Stereo DAT; overhead piano; guitar; drum	1000-hour battery; rotating caps; x-y/m-s switch; stand; windscreen; cable; bag	$299
50 Hz–15 kHz	Vocals; guitar		$234
50 Hz–18 kHz	Vocals; guitar	Enhanced isolation and feedback rejection	$375
20 Hz–20 kHz	Vocals; instruments; general studio	Case; donut-mount	$2,500
20 Hz–20 kHz	Close mic situations	1" capsule; "fat" bass switch	$1,250
25 Hz–19 kHz	Vocal; instrument	Buffered output; optional Proscreens	$599
38 Hz–18 kHz	Live vocals; instruments	Optional Proscreen pop screens $49/$59	$139
37 Hz–19 kHz	Live instruments	Large diaphragm; optional Proscreens	$139
33 Hz–19 kHz	General purpose	Switchable stage/studio EQ settings	$159
50 Hz–15 kHz	Personal studio, live performance	20' cable; adapter; case	$60
20 Hz-20 kHz	Vocal; instrument	Permanent or temporary mount	$100
20 Hz-20 kHz	Vocal; instrument	Permanent or temporary mount	$200
20 Hz–20 kHz	Vocals; overhead; broadcast; instruments; production	FET 1" 6 µm capsule	$299
20 Hz–20 kHz	Vocals; overhead; broadcast; instruments	FET 1" 6 µm capsule	$499
20 Hz–20 kHz	Vocals; overhead; broadcast; instruments	1" 6 µm capsule	$799
20 Hz-20 kHz	Vocal; instrument	Permanent or temporary mount	$400
70 Hz–18 kHz	Vocal		$169
50 Hz–18 kHz	Instrument		$109
50 Hz–18 kHz	Boundary		$209
30 Hz–18 kHz	Vocals		$179
30 Hz–18 kHz	Instruments		$159
80 Hz–15 kHz	General recording		$109
70 Hz–17 kHz	Vocals; instruments		$119
70 Hz-17 kHz	Drum overhead; hi hats; acoustic guitar	Batter or phantom power	$125
50 Hz–15 kHz	Instruments; vocals		$99
50 Hz–18 kHz	Vocals; instruments		$119
20 Hz-20 kHz	Studio vocal; instrument	Cat's-cradle shockmount; windsock; aluminum flight case	$249
20 Hz-20 kHz	Vocal; instrument; amplifier	Shockmount; windsock; aluminum flight case	$319
20 Hz-20 kHz	Vocal; instrument; amplifier	Shockmount; windsock	$159
20 Hz-20 kHz	Studio vocal	Multi-pattern select on power supply (9 patterns); cat's cradle mount; tube power supply; aluminum flight case; 7-pin XLR connect (25') cable	$799
50 Hz–15 kHz	Vocals		$65
50 Hz–15 kHz	Instruments		$49
80 Hz–12 kHz	Vocals		$39
80 Hz–12 kHz	Vocals		$39
80 Hz–12 kHz	Vocals		$26

SEE PAGE 174 FOR A COMPLETE LISTING OF MANUFACTURERS' CONTACT INFORMATION

By Bobby Owsinski

SONIC LAYERING OF EFFECTS

Sonic layering means that each instrument or element sits in its own ambient environment and this environment is generally created artificially by effects. The idea here is that these sonic atmospheres don't clash with one another, just like in the case of frequency ranges.

Here are some suggestions to make sure the sonic environments don't clash.

1. Layer reverbs by frequency, with the longest being the brightest and the shortest being the darkest.

2. Pan the reverbs any way other than hard left or right.

3. Return the reverb in mono and pan accordingly. All reverbs needn't be returned in stereo.

4. Get the bigness from the reverbs and depth from delays, or vice versa.

5. Use a bit of the longest reverb on all the major elements of the track to tie all the environments together. ■

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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
DACS	MIDI Patch Bay	N/A	10/10	Yes	No	No	No	0/0	40	N/A	Simplicity	$275
DACS	MIDI Patch Bay	N/A	10/10	No	No	No	No	No	40	N/A	Uses 1/4" patch cords	$295
Digidesign	MIDI I/O	Win, Mac	10/10	Yes	Yes	Yes	No	No	N/A	N/A	USB-powered; Full OMS/WDM compatibility, Hardware Thru mode; super accurate time-stamping	$595
Edirol	D UM-2 USB	USB	2/2	No	No	No	No	No	N/A	MTC	Power supplied by USB bus	$99
Edirol	D UM-4 USB	USB	4/4	No	No	No	No	No	N/A	MTC	Power supplied by USB bus; 4 units stackable	$199
Edirol	UM-550 USB	USB; Win; Mac	5/5	Yes	Yes	Yes	No	No	N/A	MTC	Drivers, OMS, Free MIDI Included; software/hardware control	TBA
Edirol	UM-880 USB MIDI Interface	USB, Win, Mac	8/8	Yes	Yes	Yes	No	No	N/A	MTC	Drivers, OMS, Free MIDI Included; software/hardware control	$399
Edirol	USB MIDI Interface	USB	1/1	No	No	No	No	No	N/A	MTC	Power supplied by USB bus	$69
Ego-Sys	Miditerminal 4140	Printer port	4/4	No	No	No	No	No	N/A	MTC; SMPTE (LTC)	SMPTE generator/reader, optional connection to Waveterminal	$150
Emagic	AMT 8	USB; Serial	8/8	Yes	Yes	No	No	No	32	N/A	Expandable to 192 MIDI I/O, Mac/PC	$499
Emagic	MT4	USB	2/4	Yes	Yes	No	No	No	32	N/A	Software included for patch bay programing; Mac/PC	$199
Emagic	Unitor 8 MkII	USB, Serial	8/8	Yes	Yes	No	No	No	32	SMPTE, VITC	VTC burn-in, click in; OMS, Mac/PC	$799
Encore Electronics	Expressionist 2 MIDI/CV interface	Win, Mac	1/1	Yes	Yes	No	No	6	100	MIDI clock	16-bit D/A all channels	$499
Friend Chip	DMX12/8	Win, Mac	1/1	No	No	No	No	No	N/A	N/A	6 optical in/out, 6 coaxial in/out, S/PDIF and ADAT	$500
Frontier Design	Sierra MIDI/SMPTE	PCI	8/8	No	No	No	No	No	N/A	N/A	Dedicated SMPTE I/O	$299
Infusion Systems	I-CubeX	N/A	1/1	No	No	No	No	No	1	N/A	Use with our Sensors to create alternate MIDI controllers	$625
JL Cooper	9 Pin/MMC	Win, Mac	1/1	No	No	No	No	No	N/A	GVG; ESAM2, MIDI, MMC	Control MMC via VTR 9-pin control	$500
JLCooper	MLA-1/MLA-10	N/A	4/4	No	No	No	No	No	N/A	N/A	Extends MIDI cable runs over 1,000'	$370/$500
JL Cooper	MLA-XLR	N/A	1/1	No	No	No	No	No	N/A	N/A	Extends the range of MIDI cables to over 1000'	$200
JL Cooper	MMC/9 Pin +	Win, Mac	1/1	No	No	No	No	No	N/A	Output	VTR 9-pin control	$500
MIDI Solutions	Mapper	N/A	1/1	No	No	No	Yes	No	N/A	N/A	MIDI-powered, prog via SysEx	$149
MIDI Solutions	Merger/ Quadra Merge/M8	N/A	2/1; 4/1, 8/1	Yes	No	No	No	No	N/A	N/A	MIDI-powered	$79/$129/ $279
MIDI Solutions	Relay R8	N/A	1/1	No	No	No	No	No	128	N/A	MIDI-powered	$149/$479
MIDI Solutions	Router	N/A	1/2	No	Yes	Yes	No	10	N/A	N/A	MIDI-powered, prog via SysEx	$149
MIDI Solutions	Thru; Quadra Thru/T8	N/A	1/2, 1/4, 1/8	No	No	No	No	No	N/A	N/A	Messages appearing at In sent to all outs; MIDI-powered	$49/$59/ $199
MIDI Solutions	Velocity Converter	N/A	1/1	No	No	No	No	No	40	N/A	Applies velocity curves to MIDI data; MIDI-powered, prog via SysEx	$149
MIDIator	MP-128EP	Parallel	1/2	No	No	No	No	No	N/A	N/A		$80
MIDIator	MP-128NP	Parallel	2/4	No	No	No	No	No	N/A	N/A		$110
MIDIator	MP-128SP	Parallel	2/8	No	No	No	No	No	N/A	SMPTE	SMPTE in and out	$180
MIDIator	MS-101	Serial	1/1	No	No	No	No	No	N/A	N/A		$70
MIDIator	MS-124	Serial	1/4	No	No	No	No	No	N/A	N/A		$100
MIDIator	UM1	N/A	1/1	No	No	No	No	No	N/A	N/A	Keyboard encoder; solenoid low side driver up to 128 lines	$215–$345
MIDIator	UM2	N/A	1/1	No	No	No	No	No	N/A	N/A	Solenoid driver up to 128 lines.	$195–$330
Midiman	Bi Port 2x4	Win, Mac	32/64	No	No	No	No	No	N/A	SMPTE, MTC	Serial port	$180
Midiman	Macman	Mac	1/3	No	No	No	No	No	N/A	N/A	Passive thru; serial thru (geo port)	$60
Midiman	Merge 2x2	N/A	2/2	Yes	No	No	No	No	N/A	N/A		$100
Midiman	Portman PC/P	Win	1/1	No	No	No	No	No	N/A	N/A	Includes cable (parallel)	$80
Midiman	Portman PC/S	Serial	1/1	No	No	No	No	No	N/A	N/A	Includes PC serial cable	$80
Midiman	Thru 1x4	N/A	1/4	No	No	No	No	No	N/A	N/A		$60
Midiman	Thru 3x8	N/A	3/8	No	No	No	No	No	N/A	N/A		$100
Midiman	USB MidiSport 1x1	USB	1/1	No	No	No	No	No	N/A	N/A	USB cable included; Mac/PC	$70
Midiman	USB MidiSport 4x4	USB	4/4	No	No	No	No	No	N/A	N/A	USB cable included; Mac/PC	$200
Midiman	USB Midisport 8x8	USB	8/8	Yes	No	No	No	No	N/A	SMPTE, MTC	USB and serial cable included; Mac/PC	$399
Midiman	Winman 1x1	Win	1/1	No	No	No	No	No	N/A	N/A		$70
Midiman	Winman 2x2	Win	2/2	No	No	No	No	No	N/A	N/A		$90
Midiman	Winman 4x4/S	Win	4/4	Yes	No	No	No	No	N/A	N/A	64-chan; ISA; native Win 95 drivers; 4x4 patch bay	$250
Midiman	USB MidiSport 2x2	USB	2/2	No	No	No	No	No	N/A	N/A	USB cable included; Mac/PC	$90

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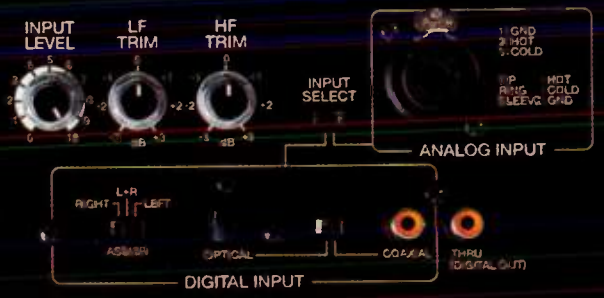

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MIDI INTERFACES, PATCH BAYS & PROCESSORS

MANUFACTURER	PRODUCT	COMPUTER INTERFACE	# OF MIDI INS/OUTS	MERGING	FILTERING	RECHANNELIZING	CONTROLLER REMAPPING	KEYBOARD SPLIT/ZONES	# OF PATCHES	SYNCHRONIZATION TYPE	SPECIAL FEATURES	PRICE
MOTU	FastLane Serial	Mac serial	1/3	No	No	No	No	No	N/A	N/A	Powers off computer; bypass for use when computer is off	$59
MOTU	Micro Express-USB	USB, serial	4/6	Yes	Yes	Yes	No	No	16	SMPTE; MTC	Operates w/o computer, supps MMC, converts click to MIDI; 2 pedal ins	$295
MOTU	MIDI Express XT-USB	USB, serial	8/8	Yes	Yes	Yes	No	No	16	SMPTE; MTC	Operates w/o computer, supps MMC, converts click to MIDI; 2 pedal ins	$395
MOTU	MIDI Timepiece AV-USB	USB, serial	8/8	Yes	Yes	Yes	No	No	128	SMPTE; MTC; video; word clock	Operates w/o computer; MIDI time stamping; many A/V sync features	$595
MOTU	PC MIDI Flyer	Parallel	2/2	No	No	No	No	No	N/A	N/A	Powers off computer; bypass for use when computer is off	$89
MOTU	Pocket Express	Serial, Parallel	2/4	No	No	No	No	No	N/A	SMPTE; MTC	Operates w/o computer SMPTE free-wheeling over drop-outs	$165
MOTU	FastLane USB	USB	2/2	No	No	No	No	No	N/A	N/A	5 colors + charcoal; thru button passes MIDI in to out w/computer off	$79
Native Instruments	4 Control	Win, Mac	1/1	Yes	No	No	Yes	No	N/A	N/A		$199
Rolls	RFX MP1288 MIDI Wizard	N/A	1/1	Yes	No	No	Yes	No	128	N/A	MIDI song select & strt/stp; up to 8 program changes on 8 MIDI chans w/1 switch; 8 CCs	$200
Steinberg	Midex 3	Win, Mac	1/3	Yes	Yes	No	No	No	128	LTB linear	Time base technology	$150
Steinberg	Midex 8	Win, Mac	8/8	Yes	Yes	No	No	No	128	LTB	USB, cable checker, MIDI thru	$499
Yamaha	UW 500	Win, Mac	1/1	No	No	No	No	No	N/A	MIDI	20-bit A/D stereo record and playback, optical I/O, software suite	$400
Yamaha	UX 16	Win, Mac	1/1	No	No	No	No	No	N/A	N/A	(2) status LED	$50
Yamaha	UX 96	Win, Mac	1/1	No	No	No	No	No	N/A	MIDI	USB powered; to host serial port	$90
Yamaha	UX 256	USB	6/6	Yes	No	No	No	No	N/A	N/A	Bundeled patch bay software for Mac and PC, self powered	$300

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MODULAR DIGITAL MULTITRACKS

MANUFACTURER	MODEL	TAPE FORMAT	ADC	DAC	SAMPLING RATE	FREQUENCY RESPONSE	DYNAMIC RANGE	SIGNAL-TO-NOISE RATIO	PROS-FADE TIMES
Alesis	LX20 20-Bit Digital Audio Recorder	S-VHS	20-bit/64x	20-bit/64x	44.1, 48 kHz	20 Hz–20 kHz	97 dB	N/A	1, 21 32, 43 ms
Alesis	XT20 20-Bit Digital Audio Recorder	S-VHS	20-bit/128x	24-bit/128x	44.1, 48 kHz	20 Hz–20 kHz	102 dB	N/A	11, 2, 32, 43 ms
Tascam	DA-88	Hi 8	16-bit	16-bit	44.1, 48 kHz	20 Hz–20 kHz	>92 dB	>92 dB	10–90 ms
Tascam	DA-78HR	Hi-8	24-bit	24-bit	44.1, 48 kHz	20 Hz–20 kHz	>104 dB	>104 dB	10–200 ms
Tascam	DA-98	Hi-8	18-bit	20-bit	44.1, 48 kHz	20 Hz–20 kHz	>92 dB	>97 dB	10–90 ms
Tascam	DA-98HR	Hi-8	24-bit	24-bit	44.1, 48 kHz	20 Hz–20 kHz	>104 dB	>104 dB	10–200 ms
Tascam	DS-D98	DTRS HI-8	24-bit w/ optional card	24-bit	44.1, 48, 88.2, 96, 176.4, 192 kHz	10 Hz-50 kHz	>102 dB A/D; >112 dB D/A	>102 dB A/D; >112 dB D/A	10-200 ms (10 ms steps)

MODULAR HARD-DISK RECORDERS

COMPANY	MODEL	# OF TRACKS	# OF VIRTUAL TRACKS	LEVELS OF UNDO	# OF LOCATE POINTS	ANALOG INPUTS	ANALOG OUTPUTS	DIGITAL I/O	BACKUP OPTIONS	JOG/SHUTTLE CONTROL
Akai	DR16 Pro	16	5 takes-includes all tracks	1	108	(8) 1/4"	(16) 1/4"	AES/EBU; S/PDIF	SCSI; DVD-RAM	Yes
Boss	VSR-880	8	128	999	1,032	8 + 2 balanced	8	S/PDIF coax/optical I/O	CD-RW software included	Yes
Edirol	A-6 Digital Multi Audio Station	4	32	99	N/A	1/4" mic; RCA	RCA	S/PDIF I/O optional	Zip	Yes
Fostex	D2424	24	32	99	99+6	8	24	ADAT; S/PDIF (AES/EBU optional)	ADAT; DAT; SCSI; DVD RAM	Yes
Fostex	D2424LV	24	32	99	99+6	(24) 1/4" TRS	(24) 1/4" TRS	ADAT; S/PDIF	ADAT; DAT, SCSI; DVD RAM	Yes
iZ Technology	Radar 24	24	0	100	100	24	24	S/PDIF, TDIF; ADAT; AES/EBU	Exabyte; DVD RAM; SCSI; IDE; EXA; Ethernet	Yes
Mackie Designs	HDR 24/96	24	192	999	2 front panel; 49 on-screen	(3) DSNB-25 (24 total)	(3) DSNB-25 (24 total)	AES/EBU, TDIF; Lightpipe w/option card	UDMA IDE HD; orb drive; FTP via Ethernet	Yes
Mackie Designs	MDR 24/96 w/opt. remote	24	192	999	2 front panel; 4	Up to 24 w/optional card	N/A	AES/EBU; TDIF; Toslink	UDMA IDE HD; orb drive; FTP via Ethernet	Yes
Mackie Designs	SDR 24/96	24	192 (8 per track)	99	4	(3) DSHB-25 (24 total)	(3) DSHB-25 (24 total)	(8) ADAT lightpipe (3 in, 3 out)	Removable HDM IBE; orb drive; USB remote 24, remote 48	Yes
Tascam	MX-2424	24	999	100	100	24	24	TDIF; ADAT optical; AES/EBU	Travan tape drive; DVD-RAM; SCSI	Yes
Tascam	MX-2424SE	24	Unlimited	99	100	Optional: 24 channels of I/O (IF-AN24 24)	Optional: 24 channels of I/O (IF-AN24 24)	AES/EBU; S/PDIF	SCSI; DVD; Travan tape	Yes

From page 26, Get in Sync

fore reaching the software, which means that you're still operating at MTC resolution.

ADAT and DA-88 time codes, in contrast, are based on the word clock. Each tick of the clock is also a tick of the time code, in a convergence of time code and "tape speed," which brings us full circle from the dual-function SMPTE of all-analog sync (see Fig. 2). Both systems offer single-sample accuracy for start sync, with a resolution of a 48,000th of a second at 48 kHz; hence the term *sample-accurate sync.*

Several combinations of computer-based audio software and hardware also offer direct support for sample-accurate time code (see Fig. 3). Due to the slight indeterminacy of computer operating systems, the sync may be perfect or it may vary slightly by a sample or so. Even with a bit of slack, however, this is much more accurate than MTC.

RESOLUTION AND RESULTS

So, what is the advantage of that increased start-point accuracy? The most compelling use is in computer editing of audio tracks from a digital tape recorder. With sample-accurate sync, the audio can be transferred into the computer and then laid back to tape with extreme precision.

To test the difference for yourself, record a track from an MDM into digital audio software, first using sample-accu-

# OF LOCATE POINTS	TOTAL HARMONIC DISTORTION	CHANNEL CROSSTALK	ANALOG I/O	DIGITAL I/O	ONBOARD SYNC	JOG/SHUTTLE CONTROL	SPECIAL FEATURES	OPTIONS	PRICE
5	>0.009%	<-90 dB	RCA	Optical digital interface	ADAT Sync	No	Auto-punch; auto-record; rehearse mode; loop	BRC master remote/sync; ADAT/EDIT PCI Card	$1,399
10	<0.005%	<-90 dB	Elco; RCA	Optical digital interface	ADAT Sync	No	Auto-punch; auto-record; rehearse mode; loop; track copy	BRC master remote/sync; ADAT/EDIT PCI Card	$2,399
2	<0.007%	>90 dB	Bal. or unbal.	TDIF	See options	Yes	108 min on120 tape	Digital interface; remote; SMPTE; MIDI and Sony 9-pin sync	$5,199
2	<0.004%	>90 dB	D-sub 25 pin bal or RCA	TDIF; S/PDIF	SMPTE in/out/thru; wordclock; MIDI	Yes	Internal mixer, save-to-tape; backwards compatible w/existing 16-bit machines	Remote	$3,399
2	>0.006%	>90 dB	D-sub 25 pin bal or RCA	TDIF	SMPTE; MIDI; 9-pin	Yes	Internal digital trk, internal digital patchbay; confidence monitoring	Digital interface; remote	$6,499
10	<0.004%	>90 dB	Optional	TDIF	SMPTE, MIDI; video	Yes	Confidence monitoring; electronic patchbay; internal mixer, save to tape	High-resolution interface; analog card remote	$6,999
RTZ plus 10	<0.005% A/D; <0.0018% D/A	>95 dB A/D, >112 dB D/A	XLR	TDIF, AES/EBU, S/PDIF	Word in; video in; AES/EBU; SMPTE	Yes	DSD recorder, Dual mode 2-track DSD; PCM multitrack confidence monitor	IF-AN98HR analog I/O	$9,500

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 with parametric midband	MIDI clock w/SPP, MTC, SMPTE, RS422 serial TC	24, 25, 29.97 29.97d, 30, 30d	6	24-bit/128x	20-bit/8x	32, 44.1, 48, 96 kHz	Yes	2 terabyte	SMPTE, MIDI, RS422 intrfcs; ADAT, TDIF, AES/EBU 16 ch I/O, EQ	$4,295
3-band	MTC; MMC; SPP	N/A	1	24-bit	24-bit	32, 44.1, 48 kHz	Yes	6 GB	VS8F-2 card for 2 stereo effects with COSM	$1,795
Yes	MIDI MTC/MMC (master, slave)	N/A	1	20-bit/64x	20-bit/128x	44.1 kHz	Optional	2.1 GB	OP-1 expansion board	$695-$795
No	MIDI clock with SPP, MTC, SMPTE	24,25,29.97, 29.97d, 30, 30d	3	24-bit/128x	24-bit/128x	32, 44.1, 44.066, 48, 88, 96 kHz	Yes	137 GB	HD; DVD RAM,16-channel A/D	$3,495
No	MIDI clock with SPP, MTC, SMPTE	24,25,29.97, 29.97d, 30, 30d	3	24-bit/128x	24-bit/128x	32, 44.1, 44.066, 48, 88, 96 kHz	Yes	137 GB	DVD RAM; Ethernet; time code	$2,495
No	SMPTE, MTC, TDIF, AES/EBU; video; ADAT	All	0	16/24-bit	16/24-bit	32-192 kHz	Yes	32 terabytes	Multi ADAT, AES/EBU, TDIF, 48/96/192 kHz analog cards	$5,690
No	SMPTE; MTC	24, 25, 29.97, 29.97 D, 30, 30 D	N/A	24-bit with card option	24-bit with AID 8 card option	44.1, 48, 96 kHz	No	32 GB	M90 removable 20 GB HD Mackie media project orb drive; remote 48, remote 24	$4,999
No	SMPTE, MTC	24, 25, 29.97, 29.97 DF, 30, 30 DI	N/A	24-bit with card option	24-bit with AID 8 card option	44.1, 48, 96 kHz	No	32 GB	M90 removable 20 GB HD Mackie media project drive; remote 48, remote 24	$3,499
No	SMPTE; MTC; ADAT; Sony 9-pin	24, 25, 29.97, 29.97 DF, 30, 30 DI	N/A	24-bit/128x	24-bit/128x	44.1, 48, 96 kHz	No	128 GB	Removable 20 GB ORD drive; micro remote;	$2,499
No	SMPTE, word clock, video sync; MIDI, TL-Bus	All	3	24-bit	24-bit	44.1, 48, 88.2, 96 kHz	Yes	36 GB	Audio I/O, back-up media, remote	$3,999
No	SMPTE; word clock; MTC, video sync, MMC	23.976/24; 24/24; 24.975/25; 25/25; 29.97/DF, 30/DF; 30/ND	2 (for I/O)	24-bit	24-bit	44.1, 48, 88.2, 96 kHz	Yes	36 GB	IF-AN24EH, IF-AN24 analog modules; IF-TD24, IF-AD24, IF-AE24 digital modules	$4,499

rate sync and then using MTC. Simultaneously play back both the computer and MDM tracks, again using sample-accurate sync for playback of the first and MTC for playback of the second, and compare the two. You'll notice that the sample-accurate tracks sound louder, with little or no phasing, while the MTC tracks sound muted and noticeably phased.

Similarly, with MTC, tracks transferred in different record passes may have noticeable differences in phase. For best results when transferring phase-correlated audio (such as a drum kit recorded with multiple mics), it's best to transfer all tracks in a single pass.

Sample-accurate time code has certainly upped the ante in sample resolution. Remember, though, that almost every CD you own was recorded using SMPTE/MTC for synchronization (if the project used sync at all). They sound just fine, don't they? So, if SMPTE/MTC sync is all you have available, don't be too concerned.

Also, remember that regardless of start-point resolution, a proper word clock setup always ensures drift-free continuous sync. So, keep your eye on those word clocks, and be safe synchers. ■

Dan Phillips *is a singer, songwriter, and producer and is part of the team at Korg Research and Development.*

PORTABLE DIGITAL STUDIOS

MANUFACTURER	PRODUCT	# OF PHYSICAL/ VIRTUAL TRACKS	# OF SIMULTANEOUS RECORD TRACKS	DATA COMPRESSION	BUILT-IN STORAGE	RECORD/ BACKUP TO	EXTERNAL DEVICE	MARKERS/ LOCATORS	UNDO LEVELS	CD-R/RW SUPPORT
Akai	DPS12i	12/250	8	No	20 GB HD	HD/HD	CD-RW; DAT; MO	2/112	250	Yes
Akai	DPS16	16/250	16	No	20 GB HD	HD/HD	CD-RW; DAT; MO	2/109	250	Yes
Akai	DPS24	24/250	20 (24 in transfer mode)	No	30 GB HD	HD/HD	CD-RW; DAT; MO	2/100	250	Yes
Boss	BR-1180/ BR-1180CD	10/80	2	Yes	20 GB HD	No	N/A	100/999	1	No (Yes BR-1180CD)
Boss	BR-532	4/32	2	Yes	No	SmartMedia	N/A	0/1	1	No
Boss	BR-8	8/64	2	Yes	100 MB Zip	No	N/A	100/0	1	No
Fostex	VF-08	8/16	2	No	10 GB HD	HD/HD	CD-RW; DAT	99/14	1	Optional
Fostex	VF-16	16/8	16	No	5.1 GB HD	HD/HD	CD-RW; DAT	13/13	1	No
Fostex	VF-160	16/8	16	No	137 GB HD	HD/Int CD-RW; SCSI; DAT; MO	DAT	N/A	1	Internal
Fostex	VF-80	8/16	2	No	20 GB HD	HD/ (optional) CD-RW	DAT	0/16	1	Internal
Korg	D12	12/84	4	No	Optional IDE HD	HD/HD	CD-RW; MO	100/4	99	ATAPI; SCSI
Korg	D1600	16/128	16	No	20 GB HD	HD/HD	CD-RW; MO	100/4	99	ATAPI; SCSI
Korg	PXR4	4/8	2	Yes	No	SmartMedia	USB	99/0	1	No
Roland	VS-1824CD	18/288	8	No	10 GB HD	Internal CD-RW	N/A	N/A	N/A	Internal
Roland	VS-2480/ VS-2480CD	24/384	16	No	80 GB HD (expandable to 128 GB)	Internal CD-RW	N/A	1000/100	999	Yes (onboard VS-2480CD)
Tascam	788	8/250	4	No	4 GB HD	HD/HD	CD-RW; MO	0/999	999	Yes
Yamaha	AW2816	16/128	8	No	20 GB HD (exp to 64 GB)	N/HD; CD-RW; SCSI	DAT; MO; SCSI	98/8	16	Internal
Yamaha	AW4416	18/128	16	No	12 GB HD	N/HD; CD-RW	DAT; MO	98/8	16	Yes
Zoom	MRS 1044CD	10/90	2	No	40 GB HD	Internal CD	Optional USB and SCSI boards	100/0	1	Internal

By Bobby Owsinski

EFFECTS TRICKS AND TIPS TO CREATE AND ENHANCE DIMENSION

• For Fatter Lead Background Vocals—Use some chorusing (very short modulated delays) panned hard left and right to fatten up the sound. Use different EQ and reverb settings on the delays. (Make sure you check the mix in mono to be sure that the delays aren't canceling.) Ride the chorusing effect, adding and subtracting it according to what sounds best.

• For Out of Tune Vocals—Use a stereo pitch shifter with one side tuned slightly high and the other tuned slightly low. Pan these left and right. The more out of tune the vocal, the more you might want to detune the pitch up and down. This does an effective job of taking the listener's attention off the sour notes.

• For Electronic Keyboards—A nice delay effect that simulates a small room can be achieved by using a stereo delay and setting the delay times to 211 ms and 222 ms.

• For Fatter Guitars—Delay the guitar about 12 ms (or whatever the tempo dictates) and hard pan both the guitar and delay. This sounds like two people playing perfectly in sync, yet sounds bigger and still keeps a nice hole open in the middle for the vocals.

• For Fatter Guitars (2)—Pan the guitar track and the delay to the center (or put your monitors in mono), then slowly increase the delay time until it sounds bigger. Increase it a little more for good measure. You'll probably find the result is 25–30 ms.

• For Fatter Guitars (3)—For years, L.A. session guitarists have automatically dialed up a stereo delay of 25 ms on one side and 50 ms on the other.

• For Tommy Lee "Thunder Drums"—For this to work, the bass drum has to sound tight to begin with, with a decent amount of beater present, and all the drums should be gated with the gate timed to the track. Set a reverb on the "cathedral" or "large hall" setting and then add a little to all parts of the kit. Pan the reverb returns to sit the reverb sound behind each part of the kit. ■

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MIXER CHANNELS	XLR MICROPHONE INPUTS	FADERS	DYNAMIC AUTOMATION ONBOARD/MIDI	SCENES	EFFECTS PROCESSORS	MTC SEND/RECEIVE	MMC SEND/RECEIVE	WAVEFORM DISPLAY	OPTIONS	PRICE
20	0	12; 1 stereo master	N/Y	24	1	Y/Y	Y/Y	Yes		$1,295
26	2	16; 1 stereo master	N/Y	16	1	Y/Y	Y/Y	Yes		$2,795
44	12	12; 1 stereo master	Y/Y	24	4	Y/Y	Y/Y	Yes		$5,499
11	2	8; 1 stereo master	N/N	8	3	Y/Y	Y/N	No	BR-1180CD features built-in CD-RW drive. FS-5U footswitch; EV-5 expression pedal	$845/$1,245
4	1	5; 1 stereo master	N/N	N/A	1	Y/Y	Y/Y	No		$495
10	2	8; 1 stereo master	N/N	8	3	Y/Y	Y/N	Y/N	FS-5U footswitch; EV-5 expression pedal	$845
10	2	8; 1 stereo master	N/N	99	1	Y/Y	Y/Y	Yes	8340 SCSI card	$699
16	2	16; 1 stereo master	N/N	100	2	Y/Y	Y/Y	Yes		$1,399
16	2	16; 1 stereo master	N/N	99	2	Y/Y		Yes		$1,399
10	2	7; 1 stereo master	N/N	99	1	Y/Y	N/N	Yes	CD-1A CD-R/RW burner; 8340 SCSI card	$699
16	2	6 mono; 3 stereo; 1 stereo master	N/Y	100	3	Y/Y	Y/Y	Yes	VS-CDR11 CD-RW; PS-1 switch, EXP-2 pedal	$1,150
24	2	16; 1 stereo master	N/Y	100	3	Y/Y	Y/Y	Yes	VS-CDR11 CD-RW; PS-1 switch, EXP-2 pedal	$2,000
4	0	5; 1 stereo master	N/N	N/A	1	N/N	N/N	No		$500
28	2	12; 1 stereo master		N/A	1 (2 optional)	N/A	N/N	No	VS8F-2 effects card	$2,495
64	8	16; 1 stereo master (motorized)	Y/Y	100 per project	2 (expandable to 8)	Y/Y	Y/Y	Yes	R-BUS 16-channel A/D or D/A I/O	$3,995/$4,695
8	0	6 mono; 1 stereo; 1 stereo master	N/Y	10	2	Y/Y	Y/Y	No	$1,149	
28	2	16; 1 stereo master	Y/N	96	2	Y/Y	Y/Y	Yes	Mini-YGDAI I/O exp cards	$2,399
44	2	16; 1 stereo master	Y/N	96	2	Y/Y	Y/Y	Yes	Mini-YGDAI I/O exp cards	$3,799
10	2	6 mono; 2 stereo; 1 stereo master	N/Y	100	1	Y/Y	Y/Y	No	USB and SCSI boards	$1,920

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
Alesis	RA-300	90W per channel	150W per channel	10 Hz-70 kHz +/- 3 dB	>105 dB	<0.02%	200	60 V/ms
Alesis	RA-500	150W per channel	250W per channel	10 Hz-70 kHz +/- 3 dB	>105 dB	<0.02%	200	60 V/ms
Ashly Audio	FTX-1501	200W per channel	300W per channel	20 Hz–100 kHz	>100 dB	0.007%	>250 @ <1 kHz (ref. 8Ω)	50 V/µs
Ashly Audio	FTX-2001	300W per channel	500W per channel	20 Hz–100 kHz	>105 dB	0.007%	>250 @ <1 kHz (ref. 8Ω)	50 V/µs
Ashly Audio	MFA-8000	750W per channel	1,200W per channel	8 Hz–100 kHz	>105 dB	0.025%	>200 @ <1 kHz (ref. 8Ω)	25 V/µs
Ashly Audio	Powerflex-4400	275W x 4	400W x 4	20-20 kHz, +/- 0.5 dB	<-100 dB, A-weighted	<0.2%	N/R	>32 V/µs
Ashly Audio	Powerflex-6250	150W x 6	250W x 6	20-20k Hz, +/- 0.5 dB	<-100 dB, A-weighted	<0.2%	N/A	>32 V/µs
Ashly Audio	SRA-120	45W per channel	60W per channel	20 Hz–20 kHz	100 dB	<0.01%	>200 @ <1 kHz (ref. 8Ω)	10 V/µs stereo/ 20 mono
Behringer	PowerPlay Pro HA4400	N/A	N/A	10 Hz–100 kHz	>99 dB	0.005%	N/A	N/A
BGW Systems	Millennium Series 1	190W per channel	290W per channel	8 Hz–150 kHz	>100 dB	<0.1%	>200 (ref. 8Ω)	>40 V/µs
BGW Systems	Millennium Series 2	300W per channel	475W per channel	8 Hz–150 kHz	>100 dB	<0.1%	>200 (ref. 8Ω)	>40 V/µs
BGW Systems	Millennium Series 3	375W per channel	600W per channel	8 Hz–150 kHz	>100 dB	<0.1%	>200 (ref. 8Ω)	>40 V/µs
BGW Systems	Performance Series 1	190W per channel	290W per channel	8 Hz–175 kHz	>100 dB	<0.1%	>200 (ref. 8Ω)	>40 V/µs
BGW Systems	Performance Series 2	300W per channel	475W per channel	8 Hz–175 kHz	>100 dB	<0.1%	>200 (ref. 8Ω)	>40 V/µs
BGW Systems	Performance Series 3	375W per channel	600W per channel	8 Hz–175 kHz	>100 dB	<0.1%	>200 (ref. 8Ω)	>40 V/µs
BGW Systems	X2500	440W per channel	700W per channel	20 Hz-20 kHz	>110 dB	<0.1% @ 1 kHz	300	20 V/µs
BGW Systems	X3800	660W per channel	1050W per channel	20 Hz-20 kHz	>110 dB	<0.1% @ 1 kHz	300	20 V/µs
BGW Systems	X5600	880W per channel	1600W per channel	20 Hz-20 kHz	>110 dB	<0.1% @ 1 kHz	300	20 V/µs
Bryston	2-B-LP-PRO	70W per channel	120W per channel	0.5 Hz–100 kHz	>100 dB	<0.01%	>500 @ 20 Hz (ref. 8Ω)	>60 V/µs
Bryston	3B-ST Pro	150W per channel	250W per channel	<1 Hz–100 kHz	>106 dB	<0.007%	>500 @ 20 Hz (ref. 8Ω)	>60 V/µs
Bryston	4B-ST Pro	300W per channel	500W per channel	<1 Hz–100 kHz	>106 dB	<0.007%	>500 @ 20 Hz (ref. 8Ω)	>60 V/µs
Bryston	5B-ST Pro 3-channel	150W per channel	250W per channel	<1 Hz–1 kHz	>106 dB	<0.007%	>500 @ 20 Hz (ref. 8Ω)	>60 V/µs
Bryston	7B-ST Pro Mono Block	600W per channel	900W per channel	<1 Hz–100 kHz	>106 dB	<0.007%	>300 @ 20 Hz (ref. 8Ω)	>60 V/µs
Bryston	Power Pac 60	60W per channel	120W per channel	<1 Hz–>1 kHz	>106 dB	<0.007%	>500 @ 20 Hz (ref. 8Ω)	>60 V/µs
Bryston	Power Pac 120	150W per channel	250W per channel	<1 Hz–>1 kHz	>106 dB	<0.007%	>500 @ 20 Hz (ref. 8Ω)	>60 V/µs
Carver	pm125	50W per channel	62W per channel	20 Hz–20 kHz	>100 dB	<0.1%	<400	10 V/µs
Carver	pm420	135W per channel	210W per channel	20 Hz–20 kHz	>100 dB	<0.1%	<400	10 V/µs
Carver	pm700	225W per channel	350W per channel	20 Hz–20 kHz	>100 dB	<0.1%	<400	40 V/µs
Carver	pm950	325W per channel	475W per channel	20 Hz–20 kHz	>100 dB	<0.1%	<400	40 V/µs
Carver	pm1400	475W per channel	700W per channel	20 Hz–20 kHz	>100 dB	<0.1%	<400	40 V/µs
Carver	pt1800	600W per channel	900W per channel	20 Hz–20 kHz	>100 dB	<0.5%	<400 @ 1 kHz	25 V/µs
Carver	pt2400	750W per channel	1,200W per channel	20 Hz–20 kHz	>100 dB	<0.5%	<400 @ 1 kHz	25 V/µs
Carver	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	PX850	260W per channel	425W per channel	20 Hz–20 kHz	>106 dB	<0.1%	>600 @ 10–400 Hz (ref. 8Ω)	70 V/µs
Carver	PXm250	70W per channel	120W per channel	20 Hz–20 kHz	>104 dB	<0.1%	>180	29 V/µs
Carver	PXm450	140W per channel	215W per channel	20 Hz–20 kHz	>108 dB	<0.1%	>200	29 V/µs
Carver	PXm900	280W per channel	440W per channel	20 Hz–20 kHz	>113 dB	<0.1%	>200	29 V/µs
Carvin	DCM150	50W per channel	75W per channel	20 Hz–20 kHz	100 dB	0.1%	>300	>30 V/µs
Carvin	DCM 600	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	DCM 1001	225W per channel	350W per channel	20 Hz-20 kHz	>100 dB	0.03%	>400	>45V/ms
Carvin	DCM1500	300W per channel	500W per channel	20 Hz–20 kHz	107 dB	0.03%	>450	>50 V/µs

POWER CONSUMPTION	PROTECTION FEATURES	AC CIRCUIT BREAKER	GROUND LIFT	INDICATOR LIGHTS	DIMENSIONS (INCHES)	WEIGHT (LBS.)	PRICE
500W (max)	N/A	10A fuse	No	Power; clip; program	18.9x3.9x10.63	19	$359
500W (max)		10A fuse	No	Power; clip; program	18.9x5.63x10.63	28.5	$459
760W	Short circuit; thermal ovrld; DC offset; RF	Yes	Yes	11-seg LED mtrs; protect LEDs	19x3.5x16.5	41	$859
1,350W	Short circuit; thermal ovrld; DC offset; RF	Yes	Yes	11-seg LED mtrs; protect LEDs	19x5.25x16.5	53	$1,139
3,000W (max)	Short circuit; thermal ovrld; DC offset; RF limit/thermal/protect LEDs	Yes	Yes	11-seg LED mtrs;	19x5.25x16.5	61	$2,139
1,600W (max)	Short circuit; thermal overload; DC offset; RF; open circuit; soft clipping; on/off transient	13A fuse	No	Signal; limit; protect; thermal	19x5.25x16.5	45	$1,379
1,500W (max)	Short circuit; thermal overload; DC offset; RF; open circuit; soft clipping; on/off transient	13A fuse	No	Signal; limit; protect; thermal	19x5.25x16.5	45	$1,799
350W	Short circuit; thermal ovrld; DC offset; RF	Yes	Yes	Signal present; clip; protect LEDs	19x1.75x10	18	$579
40W	100-120V AC(630mA); 200-240V AC (315mA)	No	No	In level: 4 LED display; out level: 4 LED display	19x1.75x8.5	5.9	$149
350W	Short circuit; RF; spkr out rlys; trn on/off; thermal DC; inst shut-off	No	Yes	Clip; pwr; signal present	19x5.25x12.8	28	$786–$943
480W	Short circuit; RF; spkr out rlys; trn on/off; thermal DC; inst shut-off	No	Yes	Clip; pwr; signal present	19x5.25x12.8	34	$925–$1,088
675W	Short circuit; RF; spkr out rlys; trn on/off; thermal DC; spkr prtct; inst shut-off	No	Yes	Clip; pwr; signal present	19x5.25x15.4	40	$1,296–$1,459
350W	Short circuit; RF; spkr out rlys; trn on/off; thermal DC; spkr prtct; inst shut-off	No	Yes	Clip; pwr; signal present	19x3.5x12.6	26	$874
480W	Short circuit; RF; spkr out rlys; trn on/off; thermal DC; spkr prtct; inst shut-off	No	Yes	Clip; pwr; signal present	19x3.5x12.6	32	$1,028
675W	Short circuit; RF; spkr out rlys; trn on/off; thermal DC; spkr prtct; inst shut-off	No	Yes	Clip; pwr; signal present	19x3.5x13.6	37	$1,440
8 A/120V	Short circuit; thermal overload; DC offset; RF; open circuit; on/off transient	20A fuse	Yes	Power, signal; clip; protect	19x5.25x18.8	50	$1,346
11.5A/120V	Short circuit; thermal overload; DC offset; RF; open circuit; on/off transient; clip limit circuit	25A fuse	Yes	Power; signal; clip; protect	19x5.25x18.8	58	$1,593
12A/120V	Short circuit; thermal overload; DC offset; RF; open circuit; on/off transient	25A fuse	Yes	Power; signal; clip; protect	19x5.25x18.8	62	$1,762
15–250W	Short circuit; RF; thermal; DC offst	No	Yes	Tricolor LED	19x1.75x10	18	$1,150
30–500W	Short circuit; RF; thermal; DC offst	No	Yes	Tricolor LED	19x5.25x9	22	$1,890
50–1,000W	Short circuit; RF; thermal; DC offst	No	Yes	Tricolor LED	19x5.25x15.5	42	$2,470
15–250W	Short circuit; RF; thermal; DC offst	No	Yes	Tricolor LED	19x5.25x15.5	33	$2,670
50–1,000W	Short circuit; RF; thermal; DC offst	No	Yes	Tricolor LED	19x5.25x15.5	42	$2,630
15–250W	Short circuit; RF; thermal; DC offst	No	Yes	Tricolor LED	12x2x5.5	6	$630
15–250W	Short circuit; RF; thermal; DC offst	No	Yes	Tricolor LED	12x3.6x7.25	10	$1,000
250W	DC offset; ovr temp; short circuit; clipping	Yes	No	Power ready; signal; clip; protect	19x1.75x13.25	13.8	$619
1,000W	DC offset; ovr temp; short circuit; clipping; circuit breaker	Yes	No	Power ready; signal; clip; protect	19x3.5x13.25	23.8	$799
500W	DC offset; ovr temp; short circuit; clipping	Yes	No	Power; 7-LED display per chan	19x3.5x13.25	30	$1,069
725W	DC offset; ovr temp; short circuit; clipping	Yes	No	Power; 7-LED display per chan	19x3.5x13.25	34	$1,269
800W	DC offset; ovr temp; short circuit; clipping	Yes	No	Power; 7-LED display per chan	19x3.5x13.25	34.2	$1,539
N/A	Shrt crct; exc high frqncy; thermal; clipping; DC; soft start/input mute	Yes	Yes	Power ready; signal; clip; protect	19x5.25x12.75	46	$2,379
N/A	Shrt crct; exc high frqncy; thermal; clipping; DC; soft start/input mute	Yes	No	Power ready; signal; clip; protect	19x5.25x12.75	48	$2,779
750W	Thermal; short circuit protect; thermal and stndby	Yes	No	Power ready; signal; clip; protect	19x5.75x15.38	58.2	$1,245
840W	Thermal; short circuit	Yes	No	Power ready; signal; clip; protect; thermal and standby	19x5.75x15.38	46	$895
424W	Thermal; short circuit	No	No	Power ready; signal; clip; protect; thermal	19x3.5x15.38	24.4	$535
640W	Thermal; short circuit	No	No	Power ready; signal; clip; protect; thermal	19x3.5x16.38	26.3	$665
1,135W	Thermal; short circuit; DC fault	No	No	Power ready; signal; clip; protect; thermal	19x5.25x15.38	28	$795
180W	Short circuit; RF; thermal; DC offset	No	No	Power; clip; signal protect	19x1.75x10	11	$230
750W (max)	Short circuit; RF; thermal; DC offset	Yes	Yes	Power, clip, signal protect	19x3.5x10	23	$320
1,200W	Short circuit; RF; thermal; DC offset	Yes	Yes	Power; clip; signal protect	19x3.5x10	26	$370
1000W (max)	Short circuit; RF; thermal; DC offset	Circuit breaker	Yes	Signal; clip, protect, power	19x3.5x10	25	$469
1,800W	Shrt crct; RF; thermal; DC offset	Yes	Yes	Power, signal; clip; protect	19x5.25x10	31	$450

SEE PAGE 174 FOR A COMPLETE LISTING OF MANUFACTURERS' CONTACT INFORMATION

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
Carvin	DCM2000	450W per channel	700W per channel	20 Hz–20 kHz	109 dB	0.03%	>500	>5 V/µs
Carvin	DCM4000	425Wx4, 1,400Wx2	700x4/2,000Wx2	20 Hz–20 kHz	>100dB	<0.05%@1 kHz	>500	>50 V/µs
Chevin	A 500	200W per channel	350W per channel	20 Hz-20 kHz	-120 dB	0.06% @ 1 dB below clip	400	40 V/µs
Chevin	A 750	250W per channel	425W per channel	20 Hz-20 kHz	-125 dB	0.04% @ 1 dB below clip	400	70 V/µs
Chevin	A 1000	350W per channel	600W per channel	20 Hz-20 kHz	-125 dB	0.04% @ 1 dB below clip	400	N/A
Crate	SPA200	70W per channel	100W per channel	20 Hz–20 kHz	N/A	N/A	N/A	10 V/µs
Crate	SPA400	125W per channel	200W per channel	20 Hz–20 kHz	100 dB	0.02% @ 1 kHz	250 (1 kHz/8 Ω)	30 V/µs
Crate	SPA1400	260W per channel	450W per channel	20 Hz–20 kHz	100 dB	0.02% @ 1 kHz	Typically 250 (1kHz, 8 Ω)	40 V/µs
Crate	SPA1400C	260W per channel	450W per channel	20 Hz–20 KHz	100 dB	0.02%	N/A	40 V/µs
Crate	SPA200	100W per channel	70W (stereo); 200W (mono)	N/A	100 dB	0.02%	N/A	10 V/µs
Crate	SPA400	200W per channel	125W (stereo); 400W (mono)	N/A	100 dB	0.02%	N/A	30 V/µs
Crest Audio	PA-150	75W per channel	100W per channel	20 Hz-20 kHz	N/A	<0.07 @ 8 ohms	>200 (ref 8)	15 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	CE-4000	600W per channel	1,200W per channel	20 Hz–20 kHz	>102 dB	0.5%	>700 (10 Hz to 400 Hz)	N/A
Crown	CP 660	60W per channel	75W per channel	20 Hz–20 kHz	>100 dB	<0.3%	>250	N/A
Crown	K1	350W per channel	550W per channel	20 Hz–20 kHz	>100 dB	<0.1%	>3,000	N/A
Crown	K2	500W per channel	800W per channel	20 Hz–20 kHz	>100 dB	<0.1%	>3,000	N/A
Crown	CT-210	110W per channel	150W per channel	20 Hz–20 kHz	>105 dB	<0.05%	>1,000	N/A
Crown	CT-410	220W per channel	240W per channel	20 Hz–20 kHz	>105 dB	<0.05%	>1,000	N/A
Crown	CT-810	305W per channel	490W per channel	20 Hz–20 kHz	>105 dB	<0.05%	>1,000	N/A
Crown	CT-1610	540W per channel	870W per channel	20 Hz–20 kHz	>105 dB	<0.05%	>1,000	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	PT-1.1	220W per channel	305W per channel	20 Hz–20 kHz	>105 dB	<0.05%	>1,000	N/A
Crown	PT-2.1	325W per channel	460W per channel	20 Hz–20 kHz	>105 dB	<0.05%	>1,000	N/A
Crown	PT-3.1	540W per channel	760W per channel	20 Hz–20 kHz	>105 dB	<0.05%	>1,000	N/A
Crown	MA-602	225W per channel	325W per channel	20 Hz–20 kHz	>105 dB	<0.05%	>1,000	N/A
Crown	MA-1202	310W per channel	480W per channel	20 Hz–20 kHz	>105 dB	<0.05%	>1,000	N/A
Crown	MA-2402	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	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	XLS 202	145W per channel	200W per channel	20 Hz-20 kHz	>100 dB	<0.15% @ 1 kHz	>200 (ref. 8Ω)	N/A
Crown	XLS 402	260W per channel	400W per channel	20 Hz-20 kHz	>100 dB	<0.15% @ 1 kHz	>200 (ref. 8Ω)	N/A
Crown	XLS 602	370W per channel	600W per channel	20 Hz-20 kHz	>100 dB	<0.15% @ 1 kHz	>200 (ref. 8Ω)	N/A
Demeter	VT275HF	60W per channel	60W per channel	N/A	<90 dB	0.06% @ 1 kHz 1W	10:1	N/A
Demeter	VTHF-300m Tube Mono Block	300W mono	300W mono	N/A	<97 dB	0.06%	10:1	N/A
Electro-Voice	Eliminator i Amplifier	300W per channel	550W per channel	20 Hz-20 kHz	>105 dB	< 0.05%	>300/<200 (100 Hz/1,000 Hz)	>30 V/µs
FBT	HP400	100W per channel	140W per channel	20 Hz–20 kHz	>100 dB	<0.02%	>150 @ 8Ω–1 kHz	>40 V/µs

POWER CONSUMPTION	PROTECTION FEATURES	AC CIRCUIT BREAKER	GROUND LIFT	INDICATOR LIGHTS	DIMENSIONS (INCHES)	WEIGHT (LBS.)	PRICE
2,400W	Shrt crct; RF; thermal; DC offset	Yes	Yes	Power; signal; clip; protect	19x5.25x10	36	$540
4,400W	Short circuit; RF; thermal; DC offset; no load; mute on/off	Yes	Yes	Signal protect; clip; power	19x5.25x16	70	$1,100
1.2 kVA	Soft clipping; DC at output; RF at output	No	No	Signal; limit	19x1.75x 8.5		$999
1.5 kVA	Soft clipping; DC at output; RF at output	No	No	Signal; limit	19x1.75x15	19	$1,349
2 kVA	Soft clipping; DC at output; RF at output	No	No	Signal; limit	19x3.5x15	19	$1,595
N/A	N/A	No	No	No	19x3.5x7	19	$400
10 amps (120 VAC)	Short circuit; RF; spkr out relays; trn on/off trnsnt; thermal	No	No	Signal; limit; fault	19x3.5x15	27	$500
N/A	Short circuit; RF; spkr out relays; trn on/off trnsnt; thermal	Yes	No	Signal; limit; protect	19x3.5x15	27	$600
N/A	Short circut; RF burnout; overtemp; speaker out relays; off/on transient;DC protection	No	No	No	19x3.5x16.7	36	$699
N/A	Variable-speed fan; short circut.; RF burnout; overtemp; speaker out relays; off/on transient;DC protections	No	No	No	19x3.5x7	19	$399
N/A	Variable-speed fan; short circut; RF burnout; overtemp; speaker out relays; on/off transient; DC protection	No	No	No	19x3.5x15	27	$499
300W max	SPS compression system; thermal overload; overload	5A fuse	Yes	Power; limit	19x1.75x8	22	$570
N/A	Short; DC; clip; other	Yes	No	Power; signal; fault; clip	19x 5.25x13	32.4	$731
N/A	Short; DC; clip; other	Yes	No	Power; signal; fault; clip	19x 5.25x13	40.2	$1,043
N/A	Short; DC; others	No	No	Power; signal;clip; fault	19x5.25x16.25	33.3	$2,237
N/A	Short; DC; other	No	No	Power; signal; fault; clip	19x 3.5x12.75	25	$864
N/A	Short; DC; clip; other	No	Yes	Sgnl; TLC; IOC; clip; enable	19x 3.5x16	32	$1,559
N/A	Short; DC; clip; other	No	Yes	Sgnl; TLC; IOC; clip; enable	19x.3.5x16	38	$1,872
N/A	Short; DC; ODEP; quad mute; other	Yes	No	IOC; SPI; ODEP; power	19x3.5x16	29.4	$991
N/A	Short; DC; ODEP; quad mute; other	Yes	No	IOC; SPI; ODEP; power	19x3.5x16	31.9	$1,252
N/A	Short; DC; ODEP; quad mute; other	Yes	No	IOC; SPI; ODEP; power	19x5.25x16	47.25	$1,747
N/A	Short; DC; ODEP; quad mute; other	Yes	No	IOC; SPI; ODEP; power	19x7x16	57.9	$2,268
N/A	Short; DC; other	No	No	IOC; signal; power	19x1.75x9	10	$496
N/A	Short; DC; other	No	No	IOC; signal; power	19x1.75x9	10	$652
N/A	Short; DC; ODEP; other	Yes	Yes	Enable; IOC/SPI	19x3.5x16	30	$869
N/A	Short; DC; ODEP; other	Yes	Yes	Enable; IOC/SPI	19x5.25x16	33	$999
N/A	Short; DC; ODEP; other	Yes	Yes	Enable; IOC/SPI	19x7x16	36.5	$1,299
N/A	Short; DC; ODEP; other	No	Yes	IOC/SPI; ODEP; enable	19x.3.5x16	39.6	$1,559
N/A	Short; DC; ODEP; other	No	Yes	IOC/SPI; ODEP; enable	19x.3.5x16	44.1	$1,820
N/A	Short; DC; ODEP; other	Yes	Yes	IOC/SPI; ODEP; enable	19x.3.5x16	51.75	$2,339
N/A	Short; DC; ODEP; other	No	Yes	Enable; ODEP	19x3.5x16	36.25	$879
N/A	Short; DC; ODEP; other	No	Yes	Enable; ODEP	19x3.5x16	41	$1,119
N/A	Short; DC; ODEP; other	Yes	Yes	Enable; ODEP	19x3.5x16	46.9	$1,459
N/A	Anti-clip limiters; switchable HP filters; output current limiting; DC protection; fuses; thermal protection for transformers	Fuse	No	Clip; power; fault	3U	30	$429
N/A	Anti-clip limiters; switchable HP filters; output current limiting; DC protection; fuses; thermal protection for transformers	Fuse	No	Clip; power; fault	3U	31	$569
N/A	Anti-clip limiters; switchable HP filters; output current limiting; DC protection; fuses; thermal protection for transformers	Fuse	No	Clip; power; fault	3U	33	$829
300W	N/A	Yes	No	LED	19x7x12	45	$2,299
600W	N/A	Yes	No	LED	19x7x15	49	$2,699
550W	Short circuit; thermal overload; DC offset; RF; open circuit; on/off transient	Yes	No	Signal; limit; protect	5.25x19x15.17	35.2	$1,262
690W (max)	DC; thermal overload; SOA; soft start; open circuit	3A fuse	Yes	Signal active; limit/clip; protect	19x3.25x18	27	$700

SEE PAGE 174 FOR A COMPLETE LISTING OF MANUFACTURERS' CONTACT INFORMATION

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
FBT	HP600	150W per channel	200W per channel	20 Hz–20 kHz	>102 dB	<0.02%	>150 @ 8Ω–1 kHz	>40 V/µs
FBT	HP1000	260W per channel	420W per channel	20 Hz–20 kHz	>105 dB	<0.02%	>150 @ 8Ω–1 kHz	>40 V/µs
FBT	Symbol 9000	450W per channel	650W per channel	20 Hz–20 kHz	>110 dB	<0.02%	>250 @ 8Ω–1 kHz	>40 V/µs
FBT	Symbol 16000	600W per channel	950W per channel	20 Hz–20 kHz	>110 dB	<0.02%	>250 @ 8Ω–1 kHz	>40 V/µs
Furman	SP-20AB Half Rack	20W per channel	20W per channel	+0, -1 20 Hz–20 kHz	99 dB	0.05%	N/A	20 V/µs
Hafler	9505	250W per channel	375W per channel	0.15 Hz–300 kHz	100 dB	<0.07%	1,000 (to 1 kHz)	150 V/µs
Hafler	P1000	50W per channel	55W per channel	0.1 Hz–100 kHz	100 dB	<0.2%	900 (to 1 kHz)	20 V/µs
Hafler	P1500	75W per channel	85W per channel	0.15 Hz–300 kHz	100 dB	<0.1%	350 (to 1 kHz)	100 V/µs
Hafler	P3000	150W per channel	200W per channel	0.15 Hz–300 kHz	100 dB	<0.1%	400 (to 1 kHz)	100 V/µs
Hafler	P4000	200W per channel	275W per channel	0.2 Hz–200 kHz	100 dB	<0.1%	500 (to 1 kHz)	100 V/µs
Hafler	P7000	350W per channel	500W per channel	0.2 Hz–200 kHz	100 dB	<0.1%	600 (to 1 kHz)	100 V/µs
Hot House	Four Hundred	125W per channel	200W per channel	3 Hz–100 kHz	>100 dB	<0.01%	>200	>60 V/µs
Hot House	M500 High Current Mono Block	150W mono	275W mono	5 Hz–100 kHz	>100 dB	0.01%	>200	>60 V/µs
Hot House	M500HV High Voltage Mono Block	375W mono	600W mono	5 Hz-100 kHz	>100 dB	0.01%	>200	>60 V/µs
Hot House	One Thousand	350W per channel	500W per channel	3 Hz–100 kHz	>100 dB	<0.01%	>200	>60 V/µs
Hot House	Six Hundred	195W per channel	325W per channel	3 Hz–100 kHz	>100 dB	<0.01%	>200	>60 V/µs
Hot House	Two Thousand	450W per channel	700W per channel	3 Hz–100 kHz	>100 dB	<0.01%	>200	>60 V/µs
Mackie Designs	M800	150W per channel	225W per channel	10 Hz–70 kHz	>104 dB	<0.025% @ 8 Ω	>250 (0–400 Hz)	>40 V/µs mono/stereo
Mackie Designs	M1400i	250W per channel	425W per channel	10 Hz–70 kHz	>107 dB	<0.025% @ 8 Ω	>350 (0–400 Hz)	>50 V/µs mono/stereo
Mackie Designs	M2600	425W per channel	700W per channel	10 Hz–70 kHz	>107dB	<0.025% @ 8 Ω	350V (0–400 Hz)	>60V/µs mono/stereo
Manley Labs	Studio 240	240W per channel	240W per channel	10 Hz–30 kHz	N/A	N/A	N/A	N/A
Manley Labs	Studio 440	500W per channel	500W 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	20 Hz–20 kHz	>100 dB	0.15%	>400	Not slew limited
Peavey	CS200X	85W per channel	85W per channel	10 Hz–40 kHz	100 dB	<0.1%–0.07%	>200 @ 4Ω	15 V/µs
Peavey	CS500A	130W per channel	200W per channel	5 Hz–50 kHz	100 dB	0.03%	>100 @ 4Ω	40 V/µs
Peavey	CS800S	240W per channel	400W per channel	3 Hz–60 kHz	100 dB	0.03%	>1,000 @ 8Ω	40 V/µs
Peavey	CS1000X	325W per channel	525W per channel	5 Hz–50 kHz	100 dB	<0.03%	>200 @ 4Ω	40 V/µs
Peavey	PV260	100W per channel	130W per channel	10 Hz–40 kHz	100 dB	<0.1%	>200 @ 8Ω	20 V/µs
Peavey	PV500	130W per channel	210W per channel	10 Hz–40 kHz	100 dB	<0.1%	>300 @ 8Ω	20 V/µs
Peavey	PV1200	270W per channel	425W per channel	10 Hz–40 kHz	100 dB	<0.1%	>300 @ 8Ω	20 V/µs
Peavey	PV2000	400W per channel	700W per channel	10 Hz–40 kHz	100 dB	<0.1%	>300 @ 8Ω	20 V/µs
QSC Audio	MX1500a	350W per channel	500W per channel	20 Hz–20 kHz	100 dB	0.05%	>200	N/A
QSC Audio	MX3000a	800W per channel	1,200W per channel	20 Hz–20 kHz	100 dB	0.1%	>200	N/A
QSC Audio	PLX 1202	200W per channel	325W per channel	8 Hz–50 kHz	106 dB	<0.05%	>500	N/A
QSC Audio	PLX 1602	300W per channel	500W per channel	8 Hz–50 kHz	106 dB	<0.05%	>500	N/A
QSC Audio	PLX 2402	425W per channel	700W per channel	8 Hz–50 kHz	106 dB	<0.05%	>500	N/A
QSC Audio	PLX 3002	500W per channel	900W per channel	8 Hz–50 kHz	106 dB	<0.05%	>500	N/A
QSC Audio	PLX 3402	700W per channel	1,100W per channel	8 Hz–50 kHz	106 dB	<0.05%	>500	N/A
QSC Audio	PowerLight 1.0	200W per channel	325W per channel	20 Hz–20 kHz	108 dB	0.1%	>350	N/A
QSC Audio	PowerLight 1.0HV	300W per channel	500W per channel	20 Hz–20 kHz	108 dB	0.1%	>350	N/A
QSC Audio	PowerLight 1.4	300W per channel	500W per channel	20 Hz–20 kHz	108 dB	0.1%	>350	N/A
QSC Audio	PowerLight 1.5X Bi-amp	200W ch. 1; 450W ch. 2	325W ch. 1; 700W ch. 2	20 Hz–20 kHz	108 dB	0.1%	>350	N/A
QSC Audio	PowerLight 1.6HVX Bi-amp	300W ch. 1; 700W ch. 2	500W ch. 1; 100W ch. 2	20 Hz–20 kHz	108 dB	0.1%	>350	N/A
QSC Audio	PowerLight 1.8	400W per channel	650W per channel	20 Hz–20 kHz	108 dB	0.1%	>350	N/A
QSC Audio	PowerLight 2.0HV	650W per channel	1,000W per channel	20 Hz–20 kHz	108 dB	0.1%	>350	N/A
QSC Audio	PowerLight 2.4MB Mono-block	1,000W mono	1,600W	20 Hz–20 kHz	108 dB	0.1%	>350	N/A
QSC Audio	RMX 850	200W per chanel	300W per channel	5 Hz–50 kHz	100 dB	<0.03%	>300 @ 8Ω	N/A
QSC Audio	RMX 1450	280W per chanel	450W per channel	5 Hz–50 kHz	100 dB	<0.03%	>300 @ 8Ω	N/A
QSC Audio	RMX 2450	500W per chanel	750W per channel	5 Hz–50 kHz	100 dB	<0.03%	>300 @ 8Ω	N/A
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

POWER CONSUMPTION	PROTECTION FEATURES	AC CIRCUIT BREAKER	GROUND LIFT	INDICATOR LIGHTS	DIMENSIONS (INCHES)	WEIGHT (LBS.)	PRICE
880W (max)	DC; thermal overload;SOA; soft start; open circuit	4A fuse	Yes	Signal active; limit/clip; protect	19x3.25x18	27	$799
1,350W (max)	DC; thermal overload;SOA; soft start; open circuit	6.5A fuse	Yes	Signal active; limit/clip; protect	19x3.25x19	29	$900
1,500W (max)	DC; thermal overload;SOA; soft start; open circuit	8A fuse	Yes	Signal active; limit/clip; protect	19x3.25x19	53	$2,000
1,750W (max)	DC; thermal overload;SOA; soft start; open circuit	10A fuse	Yes	Signal active; limit/clip; protect	19x3.25x19	62	$2,400
130W	Short circuit; thermal ovrld	Yes	Yes	Clip; signal present	8.45x1.75x8.25	9	$369
840	± Rail fuses	Yes	Yes	Power	19x5.25x12.5	50	$2,200
260W	NOMAD	Yes	Yes	Pwr; signal; clip; therm	19x1.75x8.375	12	$569
325W	Short circuit	Yes	Yes	Pwr; signal; clip; therm	19x3.5x8.5	22	$599
600W	Short circuit	Yes	Yes	Pwr; signal; clip; therm	19x3.5x9.875	23	$779
720W	Short circuit	Yes	Yes	Pwr; signal; clip; therm	19x5.25x11	34	$999
1,100W	Short circuit	Yes	Yes	Pwr; signal; clip; therm	19x3.5x12.875	40	$1,399
600W	RC network for RF	Yes	No	No	19x3.5x10.5	28	$1,699
600W	RC network for RF	Yes	No	No	19x3.5x10.5	32	$2,099
800W	RC network for RF	Yes	No	No	19x3.5x10.5	34	$2,499
1,500W	RC network for RF	Yes	No	No	19x5.25x10.5	38	$2,999
1,000W	RC network for RF	Yes	No	No	19x5.25x10.5	32	$2,499
1,500Wx2	RC network for RF	Yes	Yes	True RMS clip/channel	19x8.75x17	95	$4,999
55W	Short circuit; thermal	No	No	Power; normal & hot	19x3.5x16.25	28	$569
65W	Short circuit; thermal	No	No	Power; cold & hot; signal	19x3.5x16.25	36	$749
140W	Short circuit; thermal	No	No	Power; cold & hot; signal	19x5.2x16.65	55	$1,299
1,400W	B+ fuse	Yes	No	Yes	19x8.75x11	75	$7,000
1,400W	B+ fuse	Yes	No	Yes	19x8.75x11	75	$9,500
780W	Short circuit; hi temp; DC offset	No	No	Pwr on; high temp; (6) signal; clip	19x3.5x12.7	25	$1,099
N/A	Short circuit; thermal ovrld; DC; RF	Yes	No	On; DDT	19x1.75x12.5	16.9	$460
N/A	Short circuit; thermal ovrld; DC; RF	No	No	On; DDT 3.5	19x3.75x16.88	30.3	$700
N/A	Short circuit; thermal ovrld; DC; RF	Yes	No	On; DDT	19x5.25x17	37	$900
N/A	Short circuit; thermal ovrld; DC; RF	Yes	No	On; DDT	19x5.25x17	51	$1,100
N/A	Short circuit; thermal ovrld; DC; RF	Yes	No	On; DDT	19x3.5x9.6	15.6	$340
N/A	Short circuit; thermal ovrld; DC; RF	Yes	No	On; DDT	19x5.25x9	30	$430
N/A	Short circuit; thermal ovrld; DC; RF	Yes	No	On; DDT	19x5.25x13	43.5	$650
N/A	Short circuit; thermal ovrld; DC; RF	Yes	No	On; DDT	19x7x14	58.7	$850
N/A	Full short circuit; thermal mtng; ultrasonc/RF	No	No	On; clip; protect; signal	17.9x3.5	42	$1,425
N/A	Full short circuit; thermal mtng; ultrasonc/RF	No	No	On; clip; protect; signal	17.9x5.25	69	$2,600
N/A	Full short circuit; thermal mtng; ultrasonc/RF	No	No	On; sgnl lddr; clip; prtct; parallel/bridge mode	19x3.5x13.25	21	$838
N/A	Full short circuit; thermal mtng; ultrasonc/RF	No	No	On; sgnl lddr; clip; prtct; parallel/bridge mode	19x3.5x13.25	21	$978
N/A	Full short circuit; thermal mtng; ultrasonc/RF	No	No	On; sgnl lddr; clip; prtct; parallel/bridge mode	19x3.5x13.25	21	$1,258
N/A	Full short circuit; thermal mtng; ultrasonc/RF	No	No	On; sgnl lddr; clip; prtct; parallel/bridge mode	19x3.5x13.25	21	$1,398
N/A	Full short circuit; thermal mtng; ultrasonc/RF	No	No	On; sgnl lddr; clip; prtct; parallel/bridge mode	19x3.5x13.25	21	$1,638
N/A	Full short circuit; thermal mtng; ultrasonc/RF	No	No	On; sgnl lddr; clip; prtct; parallel/bridge mode	17.9x3.5	18	$1,698
N/A	Full short circuit; thermal mtng; ultrasonc/RF	No	No	On; clip, signal; standby	17.9 x 3.5	18	$1,748
N/A	Full short circuit; thermal mtng; ultrasonc/RF	No	No	On; clip, signal; standby, protect	17.9x3.5	18	$1,778
N/A	Full short circuit; thermal mtng; ultrasonc/RF	No	No	On; clip; signal; standby	17.9 x 3.5	18	$1,778
N/A	Full short circuit; thermal mtng; ultrasonc/RF	No	No	On; clip; signal; standby	17.9 x 3.5	18	$1,948
N/A	Full short circuit; thermal mtng; ultrasonc/RF	No	No	On; clip; signal; standby; protect	17.9x3.5	18	$2,028
N/A	Full short circuit; thermal mtng; ultrasonc/RF	No	No	On; clip; signal; standby; protect	17.9x3.5	18	$2,198
N/A	Full short circuit; thermal mtng; ultrasonc/RF	No	No	On; clip, signal; standby	17.9 x 3.5	18	$2,068
N/A	DC; thermal overload	Yes	No	Signal; clip LEDs	19x3.5x15.9	35	$429
N/A	DC; thermal overload	Yes	No	Signal; clip LEDs	19x3.5x15.9	40	$549
N/A	DC; thermal overload	Yes	No	Signal; clip LEDs	19x3.5x15.9	40	$779
2,200W	Main fuse; chan fuses; forced cooling	No	No	Chan-rdy LED; clip limit LED; SOA limit LED	19x5.25x11	44	$1,649
N/A	Yes	No	Yes	Yes	19x14.375x1.9375	11.1	$795

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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
Samson	Servo 120	52W per channel	60W per chann	10 Hz–100 kHz	10[illegible] dB	<0.05%	>150	N/A
Samson	Servo 170	60W per channel	85W per chann	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
Sony	SRP-P50	50W per channel	75W per channel	20 Hz–20 kHz	N/A	<0 .05%	N/A	N/A
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	PL600M	255W mono	395W 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
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	PS1602	525W per channel	620W per channel	20 Hz–20 kHz	100 dB	<0.05%	200:1	56 V/µs
Stewart Audio	CA-400	110W per channel	200W per channel	20 Hz–20 kHZ	>100 dB	<0.1%	>500	30 V/µs
Stewart Audio	CA-800	200W per channel	400W per channel	20 Hz–20 kHz	>100 dB	0.1%	>500	30 V/µs
Stewart Audio	CVA-7400	N/A	200W per channel	30 Hz–20 kHz	>100 dB	<0.1%	>500	30 V/µs
Stewart Audio	CVA-7800	N/A	400W per channel	30 Hz–20 kHz	>100 dB	<0.1%	>500	30 V/µs
Stewart Audio	PR-500	110W per channel	190W per channel	15 Hz–20 kHz	>108 dB	<0.05%	>500	>35 V/µs
Stewart Audio	PR-1000	200W per channel	350W 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	400W per channel	650W 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	110W per channel	190W per channel	20 Hz–20 kHz	>100 dB	<0.1%	>500	>30 V/µs
Stewart Audio	PA-50B	25W per channel	50W per channel	20 Hz–20 kHz	100 dB	<0.08%	>200 @ 8Ω	30 V/µs
Stewart Audio	PA-100B	50W per channel	90W per channel	20 Hz–20 kHz	98 dB	<0.08%	<200 @ 8Ω	30 V/µs
Stewart Audio	PA-200B	50W per channel	90W per channel	20 Hz–20 kHZ	98 dB	<0.08%	>200 @ 8Ω	30 V/µs
Studiomaster	600E	140W per channel	210W per channel	20 Hz–20 kHz	100 dB	0.015%	100	12 V/µs
Studiomaster	900 E	210W per channel	350W per channel	20 Hz–20 kHz	100 dB	0.008%	200	20 V/µs
Studiomaster	1500 E	375W per channel	600W per channel	20 Hz–20 kHz	100 dB	0.015%	200	20 V/µs
Studiomaster	2000 E	500W per channel	800W per channel	20 Hz–20 kHz	100 dB	0.015%	200	20 V/µs
Tsunami	HQ-1302S (SMPS)	380W per channel	650W per channel	10 Hz-50 kHz	>/= 100 dB	</= 0.1% @ 1 0W ref 20-20 kHz	>/= 200 (@ 1 kHz, 8 ohms)	20V/µs (stereo 8 ohms)
Tsunami	HQ-2002S (SMPS)	600W per channel	1000W per channel	10 Hz-50 kHz	>/= 100 dB	</= 0.1% @ 10W ref 20-20 kHz	>/= 200 (@ 1 kHz, 8 ohms)	20V/µs (stereo 8 ohms)
Tsunami	HQ-3.4 (Conventional)	700W per channel	1200W per channel	10 Hz-60 kHz	100 dB AWTD	0.1% @ 10W ref 20-20 kHz	> 200 (50 Hz 8 ohms)	39V/µs (stereo 8 ohms)
Tsunami	HQ-702S (SMPS)	220W per channel	350W per channel	10 Hz-50 kHz	>/= 100 dB	</= 0.1% @ 10W ref 20-20 kHz	>/= 200 (@ 1 kHz, 8 ohms)	20V/µs (stereo 8 ohms)
Tsunami	HQ-902S (SMPS)	280W per channel	450W per channel	10 Hz-50 kHz	>/= 100 dB	</= 0.1% @ 10W ref 20-20 kHz	>/= 200 (@ 1 kHz, 8 ohms)	20V/µs (stereo 8 ohms)
Tube Works	1160 MosValve	60W per channel	80W per channel	N/A	>95 dB	N/A	N/A	N/A
Tube Works	1500 MosValve	185W per channel	250W per channel	N/A	>97 dB	N/A	N/A	N/A
Whirlwind	P-12	11W per channel	14W per channel	20 Hz–20 kHz	>96 dB	0.2% @6 W	N/A	9.6 V/µs
Yamaha	CP2000	400W per channel	600W per channel	20 Hz–50 kHz	104 dB	0.1%	>200 (ref 8Ω)	N/A
Yamaha	P1600	160W per channel	200W per channel	10 Hz–50 kHz	101 dB	0.05%	>200 (ref 8Ω)	±30 V/µs
Yamaha	P3200	340W per channel	440W per channel	10 Hz–50 kHz	104 dB	0.05%	≥200 (ref 8Ω)	±30 V/µs
Yamaha	P4500	460W per channel	620W per channel	10 Hz–50 kHz	105 dB	0.05%	200 (ref 8Ω)	30 V/µs
Yorkville Sound	SR-300	110W per channel	150W per channel	20 Hz–20 kHz	95 dB	<0.015%	>400	20 V/µs

POWER CONSUMPTION	PROTECTION FEATURES	AC CIRCUIT BREAKER	GROUND LIFT	INDICATOR LIGHTS	DIMENSIONS (INCHES)	WEIGHT (LBS.)	PRICE
240W	Short circuit; thermal; DC offset	No	No	Prot LED; 5-seg/3-color level meters; Pwr LED, spkr-dsbl LED (for headphone)	17.5 (19 w/rack ears incl) x 1.75x11.5	15.6	$280
838W	Thermal; DC offset	Yes	No	Clip; idle; protect; power	19x5.2x9.2	13.7	$240
420W	Short circuit; thermal ovrld; DC offset	No	No	Clip; peak; protect; power	19x1.72x10.4	14.3	$280
430W; 480W	Thermal; DC offset	Yes	No	Clip; idle; protect; power	19x3.5x9.5	7.6	$420
160W	N/A	No	No	2-color input/peak/fault-fornt panel LEDs	19x1.75x13.75	17	$545
310W; 335W	Thermal protection; DC offset	Yes	No	Clip; protect; power; mono bridge	19x1.72x10.4	14.3	$380
N/A	Thermal; DC offset	Yes	No	Clip; protect; power	19x3.5x14	26.4	$550
N/A	Thermal; DC offset	Yes	No	Clip; protect; power	3.5x19x14	33.5	$550
1,080W	Short circuit; thermal ovrld; DC offset; current limit; pwr-up/dwn	Yes	No	Clip; protect; power; mono bridge	19x3.47x14	34.1	$550
1,080W	Thermal overload; DC offset	Yes	No	Clip; protect; power; mono bridge	19x5.23x16	38	$700
1,000W	Short circuit; thermal overload; DC offset; current limit	Yes	Yes	Clip; protect; power; mono bridge	19x1.72x14	15.8	$600
1,800W	Thermal overload; DC offset	Yes	No	Clip; protect; power; mono bridge	19x3.5x16	52	$1,000
1,900W	Thermal overload; DC offset	Yes	No	Clip; protect; power; mono bridge	19x5.23x16	40	$1,000
1,900W	Thermal overload; DC offset	Yes	No	Clip, protect, power, mono bridge, temperature	19x3.5x14	21	$1,100
120 VAC	7-stage circuitguard protection/VIF limiting	Yes	No	3 pin XLR; barrier strip inputs	1.75x19x14.8	10	$749
120 VAC	7-stage circuitguard/VIF limiting	Yes	No	3 pin XLR; barrier strip inputs	1.75x19x14.8	11	$1,049
120 VAC	7-stage circuitguard protection/VIF limiting	Yes	No	3 pin XLR; barrier strip output	19x1.75x15.3	10	$749
120 VAC	7-stage circuit protection/VIF limiting	Yes	No	3 pin XLR, barrier strip inputs	17.5x19x14.8	11	$1,049
3.5 amps	7-stg crct guard, short circuit, thermal ovrld, DC offset; RF	Yes	No	Clip; signal; power	19x1.72x15	10	$799
5.25 amps	7-stg crct guard, short circuit, thermal ovrld, DC offset; RF	Yes	No	Clip; signal; power	19x1.72x15	11	$1,099
6 amps	7-stg crct guard, short circuit, thermal ovrld, DC offset; RF	Yes	No	Clip; signal; power	19x1.72x15	11	$999
5 amps	7-stg crct guard; short circuit, thermal ovrld, DC offset; RF	Yes	No	Clip, signal; power	19x1.72x15	16	$1,199
5 amps	7-stg crct guard; short circuit, thermal ovrld, DC offset; RF	Yes	No	Clip; signal, power	19x1.72x15	17	$1,399
5.25 amps	7-stg crct guard, short circuit, thermal ovrld, DC offset; RF	Yes	No	Clip; signal; power	19x1.72x5.5	5.5	$469
5.8 amps	7-stg crct guard, short circuit, thermal ovrld, DC offset; RF	Yes	No	Clip, signal; power	19x1.72x15	10	$699
100W	N/A	Yes	No	N/A	8.2x1.75x6.2	3.5	$325
100W	N/A	Yes	No	N/A	8.2x1.75x6.2	5.5	$425
200W	N/A	Yes	No	N/A	8.5x1.75x10.2	5.5	$455
6 amps	Gated pwr stg, crow bar spkr protection	No	Yes	Peak; temp; fault; power	19x3.5x17.1	30	$500
8.6 amps	Gated pwr stg, crow bar spkr protection	No	Yes	Peak, temp, fault; mono; bridge; power	17x16x3 9/16	38	$690
15 amps	Gated pwr stg, crow bar spkr protection	No	Yes	Peak; temp; fault; mono, bridge; power	19x3.5x17.1	42	$895
20 amps	Gated pwr stg, crow bar spkr protection	No	Yes	Peak, temp, fault; mono; bridge; power	19x3.5x17.1	45	$1,195
1,980W	Muting, DC sensing, temperature; overcurrent limiter	20A fuse	No	Power; protect; signal; peak	12x3.5x18.5	25	$995
2,900W	Muting; DC sensing; temperature; overcurrent limiter	20A fuse	No	Power; protect; signal; peak	12x3.5x18.5	27.5	$1,195
2,900W	Muting; DC sensing; temperature; overcurrent limiter	20A fuse	No	Power, protect; signal; peak	19x5.2x17.75	59.5	$1,195
1,100W	Muting, DC sensing; temperature; overcurrent limiter	20A fuse	No	Power, protect; signal; peak	12x3.5x18.5	21	$695
1,380W	Muting, DC sensing, temperature; overcurrent limiter	20A fuse	No	Power, protect; signal; peak	12x3.5x18.5	25	$895
400W	Short circuit, thermal	No	No	Power	19x3.5x7	13	$419
1,400W	Short circuit; thermal, time dly turn-on relay	No	No	Power; clip	19x3.5x11.5	30	$699
75W	SOAR	No	Yes	Clip	19x1.75	N/A	$300
400W	On mute; short circuit; thermal; DC detector	No	No	Signal; limit; protect; temp; power	19x3.5x16.5	30	$799
600W	On mute, thermal; DC detector	No	No	Power, temp; protection; clip; signal	19x3.5x18	34	$599
400W	On/off, mute; short circuit, thermal; DC detector	No	No	Signal; clip; power, protect, temp	19x3.5x18	32	$849
500W	On/off, short circuit, thermal; DC detector	No	No	Signal, clip; power, protect; temp		34.5	$999
500W	Current limit; thermal	Yes	No	Activity, clip, limit	19x15x3.5	22.5	$499

SEE PAGE 174 FOR A COMPLETE LISTING OF MANUFACTURERS' CONTACT INFORMATION

MANUFACTURER	PRODUCT	ENCLOSURE TYPE	POWERED / UNPOWERED	FREQUENCY RESPONSE	SENSITIVITY	CROSSOVER FREQUENCY	WOOFER SIZE AND TYPE
ADAM	P11-A	Ported	Powered	48 Hz-35 kHz	10 dB	2 kHz	-
ADAM	P22-A	Ported	Powered	35 Hz–35 kHz	10 dB	1.8 kHz	9" with Nomex cone
Alesis	M1 Active Mk2	Ported	Powered	45 Hz–22 kHz	N/A	2 kHz	6.5" non-woven carbon fiber
Alesis	Monitor One Mk2	Superport vented	Unpowered	45 Hz–18 kHz	88 dB	2.5 kHz	6.5" polypropylene cone
Ambiance Acoustics	California Cube Loudspeaker System	Vented	Passive enclosure; outboard processor	45 Hz –16.5 kHz (-5 dB)	90 dB	N/A	N/A
Ambiance Acoustics	Hyper Cube Loudspeaker System	Vented	Passive enclosure; outboard processor	45 Hz–16.5 kHz (-5 dB)	92 dB	N/A	N/A
Ambiance Acoustics	Super Cube Loudspeaker System	Vented	Passive enclosure; outboard processor	45 Hz–16.5 kHz (-5 dB)	91 dB	N/A	N/A
A.R.T.	ART SLM-1 Studio Linear Monitor	Ported tuned 2" cylindrical	Unpowered	40 Hz-20 kHz (±3 dB)	90 dB @ 1W/1m	2.5 kHz	6.5" foam surround
ATC	SCM10 Pro	Sealed	Unpowered	65 Hz–20 kHz (-6 dB)	80 dB	2.8 kHz	5"
ATC	SCM20 Pro	Sealed	Unpowered	60 Hz–20 kHz (-6 dB)	86 dB	2.8 kHz	6.5" superlinear
ATC	SCM20A Pro	Sealed 20 liter cast aluminum	Powered	N/A	N/A	2.8 kHz	6.5" superlinear
ATC	SCM50A Pro	Ported reflex	Powered	38 Hz–20 kHz (-6 dB)	N/A	380 Hz, 3.5 kHz	9" superlinear
ATC	SCM100A Pro	Sealed	Powered	32 Hz–20 kHz (-6 dB)	-115 dB	380 Hz, 3.5 kHz	12" superlinear
Audix	N-5	Bass reflex	Unpowered	40 Hz–20 kHz	87 dB	2.2 kHz	7" Kevlar
Audix	N-10	Bass reflex	Unpowered	40 Hz–20 kHz	89 dB	2.2 kHz	2x7" Kevlar
Audix	PH150	Bass reflex	Powered	50 Hz–20 kHz	86 dB	2.5 kHz	5.25" poly
Audix	PH250	Wood composite	Powered	50 Hz–18 kHz	96 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 (±3dB w/ELF processor)	92 dB	N/A	2x10" EL-10 woofers
Bag End	Infrasub-12 Subwoofer	Sealed	Powered	8-95 Hz	N/A	N/A	12" ELF
Bag End	Infrasub-18 Subwoofer	Sealed	Powered	8–95 Hz (±3 dB)	N/A	N/A	18" EL-18P woofer
Bag End	MM-8 Nearfield Monitor	Ported	Unpowered	95 Hz–20 kHz (±3 dB)	93 dB	Time-Align EQ filter @ 2.9 kHz	8" LF
Bag End	MM-8H	Ported	Unpowered	95 Hz–20 kHz (±3 dB)	93 dB	Time-Align EQ filter @ 2.9 kHz	8" LF
Barbetta	D-10	Ported reflex	MOSFET powered biamp	39 Hz–22 kHz (±1 dB)	N/A	2,330 Hz	10" carbon fibre
Barbetta	Diva D-9	Ported reflex	Powered	48 Hz-20 kHz	N/A	2.2 kHz	8" aerogel
Barbetta	Diva Omnifield D-8	Ported reflex	Powered	40 Hz-20 kHz	N/A	2.2 kHz	8" laminated fibre
Barbetta	Diva Omnifield D-10	Ported reflex	Powered	40 Hz-20 kHz (+/-3 dB)	N/A	2.2 kHz	10" treated fibre
Behringer	Truth B2031	N/A	Powered	50 Hz–20 kHz	116 dB	2 kHz	8.75" polycarbonate diaphragm
BGW Systems	M850i Subwoofer	Ported	Powered	20-180 Hz	>120 dB SPL max output	63-180 Hz	15" custom
Blue Sky	SAT 6.5	Sealed	Powered	80 Hz-20 kHz	200 mV = 90 dB SPL 1M	1.5 kHz	N/A
Blue Sky	SUB 12	Sealed	Powered	30-200 Hz (20-200 Hz in-room)	100 mV = 90 dB SPL 1M	80 Hz (bass management section)	12" long excursion
Blue Sky	Pyramid	Sealed	Unpowered	80 Hz-18 kHz	87 dB	N/A	N/A
Carvin	SRS 6.5	Ported reflex	Unpowered	50 Hz–20 kHz	92.5 dB	Switchable	6.5 Kevlar
Carvin	SRS6.5 "A"	Ported reflex	Powered	20 Hz-20 kHz	92.5 dB	Switchable	6.5" kevlar
Cerwin Vega	CM-80	N/A	Unpowered	40 Hz–20 kHz	93 dB	2.5 kHz	8"
D.A.S. Audio	Monitor 6	Ported reflex	Unpowered	40 Hz-40 kHz	85 dB	N/A	6.5 polyporpylene
D.A.S. Audio	Monitor 8	Ported reflex	Unpowered	38 Hz-33 kHz	89 dB	N/A	8" polyporpylene
Diamond Audio	S2 Pro-Media 1060 Subwoofer	Dual-port	Powered	50–140 Hz	N/A	12 dB/octave continuously variable from 70 to 140 Hz	6.5" long-throw neodymium DVC
Diamond Audio	S2 Pro-Media 1100 Subwoofer	Dual-port vented	Powered	30–140 Hz	N/A	12 dB/octave continuously variable from 70 to 140 Hz	8" long-throw neodymium DVC
Diamond Audio	S2 Pro-Media 4100 System	Dual-port vented	Powered	50 Hz–20 kHz (±3 dB)	N/A	120 Hz: 12 dB/octave active (HP and LP), 3.5 kHz: 12/6 dB/octave passive (HP/LP)	8" long-throw neodymium DVC
Dynaudio Acoustics	Air 6	Bass reflex	Powered	40 Hz-22 kHz	N/A	2.15 kHz	6.5"
Dynaudio Acoustics	Air 15	Bass reflex	Powered	33 Hz-22 kHz	N/A	2.15 kHz	10"
Dynaudio Acoustics	BM5	Composite	Unpowered	55 Hz–29 kHz	87 dB	2.5 kHz	7"
Dynaudio Acoustics	BM6A/BM6	Composite	Powered	42 Hz–21 kHz	86 dB	2.2 kHz	7"
Dynaudio Acoustics	BM15A/BM15P	Composite	Powered	40 Hz–21 kHz	88 dB	2.2 kHz	10"

MIDRANGE SIZE AND TYPE	TWEETER SIZE AND TYPE	MAGNETIC SHIELDING	CABINET DIMENSIONS (HXWXD)	WEIGHT (LBS.)	NOTES	PRICE (PER PAIR)
N/A	1.3" folded ribbon	Yes	11.03x12.99x8.27	22		$1,895
N/A	3.74" folded ribbon	Yes	17x13.39x10.25	28.7		$2,495
N/A	1" silk dome	Yes	8.5x15x9.25	21	Bi-amplified; shielded; new HF/LF transducers	$649
N/A	1" silk dome	Yes	15x8.5x10	18	5-way binding posts	$299
(4) 4.5" full-range drivers	N/A	No	13.6x13.6x13.6	Enclosure: 27 equalizer: 3	System includes two speakers and one processor	$1,295
(16) 4.5" full range drivers	N/A	No	13.6x13.6x13.6	Enclosure: 40 equalizer: 3	System includes two speakers and one processor	$1,995
(9) 4.5" full range drivers	N/A	No	13.6x13.6x13.6	Enclosure: 32 equalizer: 3	System includes two speakers and one processor	$1,595
N/A	1" soft (silk) dome	Yes	16x10x9	18		$299
N/A	1" soft dome	Optional	15x7.1x10	22		$1,900
N/A	1" soft dome	Optional	17.3x9.8x12.4	50.6		$3,600
N/A	1" soft dome	Optional	17.6x10.6x12.2	66		$5,400
3" soft dome	1" soft dome	Optional	28.2x13.8x18.8	107.8		$9,999
3" soft dome	1" soft dome	Optional	32.8x15.7x22.29	143		$12,999
N/A	1" cloth dome	No	15x9.5x11	24		$1,495
N/A	1" cloth dome	No	22x10x13.5	45		$1,995
N/A	1" dome	Yes	9x6x9	18		$479
N/A	1" dome	Yes	12.5x10x8	36		$649
N/A	1" cloth dome	Optional	13x9x10	18		$599
N/A	N/A	No	13x22x13	44	Studio subwoofer for use w/ELF processor	$760
N/A	N/A	Yes	15x18x16	57	Time-align subwoofer w/8Hz response, 400W power amp	$1,670 each
N/A	N/A	No	23.5x21.25x18.25	88	Time-align subwoofer w/8 Hz response, 400W power amp	$1,670
N/A	1.75" aluminum compression HF	No	16.5x12.5x8.5	28	For use w/ELF subwoofer, EQ, polarity switch	$2,640
N/A	1.75" aluminum compression HF	No	16.5x12.5x8.5	29	Includes cloth grille (no switches)	$2,440
N/A	1" silk dome	Optional	14.5x12x17	47	Bi-amplified; patented active control technology	$4,995
N/A	25 mm silk dome	Optional	16x12x13	36	Biamplified mosfet powered; mospath signal processor;	$1,295
N/A	26mm titanium dome	Optional	14.5x19.5x13.75	41.3	Biamplified mosfet power; mosdata signal processor; wide sweet spot	$3,995
N/A	26 mm titanium dome	Optional	16.5x20.5x14.75	53	Biamplified mosfet power mospath signal processor; wide sweet spots	$4,995
N/A	25 mm ferrofluid-cooled dome	No	15.75x9.84x11.41	30.8	2-way active; well-balanced vertical and horizontal dispersion; 2 amplifiers; XLR & phone	$490
N/A	N/A	No	21.25x21.25x31	180	Excursion protection circuits	$4,200 each
6.5" long excursion (midbass)	1" dual-concentric diaphragm, neodymium motor	Yes	12x 8x11.88 (with heatsink)	27	THX pm3 certified; designed to be used with the SUB 12	$1,000
N/A	N/A	Yes	18x16x22.07 (with heatsink and grill)	N/A	THX pm3 certified; designed to be used with the SAT 6.5	$595 each
3x5 paper	N/A	Yes	7.12x7.87x6.5	2.8	Emulates Consumer Systems	$299
N/A	N/A	Yes	9.25x9x14.75	21	Contour switch	$280
N/A	N/A	Yes	9.25Wx14.75Hx11.75D	N/A	Biamped; shielded	$450
N/A	1" system-matched dome tweeter	No	10.88 x20x1.5	26	Rear-loaded bass reflex cabinet design	$500
N/A	0.75 aluminum dome ferrofluid cooled	No	13.5x6.5x10.5	15.2		$798
N/A	1" ferrofluid cooled aluminum dome	No	16.5x11x11.5	28		$918
N/A	N/A	Yes	11.5x8.5x14.5	20	RCA (line lvl) or push-type spkr cnnctrs (amplified lvls); bass output lvl cnrt; polarity switch	$289
N/A	N/A	Yes	16.5x8.5x17	30	RCA (line lvl) or push-type spkr cnnctrs (amplified lvls); bass output lvl cnrt; polarity switch	$399
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 spkr stnds; mic input w/lvl cntrl; S2 TP-1 for use w/existing preamps	$649
N/A	1.10"	Yes	13.3x8.5x13.58	21.6	Digital and analog inputs; intelligent networking; bass management	$2,820
N/A	1.10"	Yes	16.73x10.82x15.55	34.17	Digital and analog inputs; intelligent networking; bass management	$3,620
N/A	1"	Yes	12x8x10	12.5		$799
N/A	1"	No	15x9x12/13x8x10	26.4/15.2		$2,599/$1,169
N/A	1"	No	18x11x5/17x10x13	41.8/27.1		$3,599/$1,529

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REFERENCE MONITORS

MANUFACTURER	PRODUCT	ENCLOSURE TYPE	POWERED/ UNPOWERED	FREQUENCY RESPONSE	SENSITIVITY	CROSSOVER FREQUENCY	WOOFER SIZE AND TYPE
Dynaudio Acoustics	BX30	Subwoofer	Powered	22–120 Hz	115 dB	95 Hz	2x12"
Dynaudio Acoustics	M1	Composite	Unpowered	50 Hz–20 kHz	88 dB	2 kHz	2x6"
Edirol	DM-5	Bass reflex	Powered	68 Hz–22 kHz	N/A	2.3 kHz	5" foam polypropylene
Edirol	MA-5A	Bass reflex	Powered	50 Hz-20 kHz	-10 dBu	N/A	3.62"
Edirol	MA-5D	Bass reflex	Powered	50 Hz-20 kHz	-10 dBu	N/A	2.62"
Edirol	MA-10A	Bass reflex	Powered	45 Hz-35 kHz	-10 dBu	N/A	3.62"
Edirol	MA-10D	Bass reflex	Powered	45 Hz-35 kHz	-10 dBu	N/A	3.62"
Edirol	MA-110	Bass reflex	Powered	75 Hz–18 kHz	87 dB	N/A	4.72
Edirol	MA-150U	Bass reflex	Powered	75 Hz–18 kHz	N/A	2.3 kHz	4.72" foam polypropylene
Electro-Voice	EVID Premium 4.2	Dual ported reflex	Unpowered	42 Hz-20 kHz	89 dB	2.2 kHz	Dual 4"
Electro-Voice	EVID Premium 6.2	Dual ported reflex	Unpowered	6.2 Hz-20 kHz	94 dB	1.6 kHz	Dual 6"
Electro-Voice	S-40	Vented	Unpowered	85 Hz–20 kHz	85 dB	3.5 kHz	5.25"
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	20/20/12 System Subwoofer	Ported	Powered	28–120 Hz (-3 dB)	N/A	LFE: 120 Hz, third order, monitor: variable, 30–80 Hz, third order	12" high temperature long-throw coated cone
Event Electronics	20/20/15 System Subwoofer	Ported	Powered	28–120 Hz (-3 dB)	N/A	LFE: 120 Hz, third order, monitor: variable, 30–80 Hz, third order	15" high temperature long-throw coated cone
Event Electronics	20/20bas Biamplified System	Ported	Powered	35 Hz–20 kHz, ±3 dB (-2 dB @ 38 Hz)	N/A	2.6 kHz, active fourth order	8" mineral-filled polypropylene cone
Event Electronics	Project Studio 5 Biamplified Direct Field Monitor	Ported	Powered	53 Hz–19 kHz (±3 dB)	N/A	2.6 kHz, active second order	5.25" mineral-filled polypropylene cone
Event Electronics	Project Studio 6 Biamplified Direct Field Monitor	Ported	Powered	45 Hz–20 kHz (±3 dB)	N/A	2.6 kHz, active fourth order	6.5" mineral-filled polypropylene cone
Event Electronics	Project Studio 8 Biamplified Direct Field Monitor	Ported	Powered	35 Hz–20 kHz (±3 dB)	N/A	2.6 kHz, active fourth order	8" mineral-filled polypropylene cone
FBT	Jolly 3	Ported	Unpowered	80 Hz–20 kHz	93 dB	3.5 kHz	5" polypropylene-coated paper cone
FBT	Jolly 3A	Ported	Powered	80 Hz–20 kHz	93 dB	3.5 kHz	5" polypropylene-coated paper cone
FBT	Esprit 3.0	Ported	Unpowered	70 Hz–19 kHz	97.5 dB	3.5 kHz	10" polypropylene-coated paper cone
FBT	Esprit 3.0A	Ported	Powered	70 Hz–19 kHz	97.5 dB	3.5 kHz	10" polypropylene-coated paper cone
Fostex	6301BEA	Sealed	Powered	80 Hz–13 kHz	84 dB	N/A	N/A
Fostex	NF-1	Ported bass reflex featuring HP sound reflectors	Unpowered	50 Hz–40 kHz	89 dB	10 kHz	6.5" cone
Fostex	NF-1A	Ported bass reflex featuring HP sound reflectors	Powered	50 Hz–40 kHz	89 dB	10 kHz	6.5" cone
Fostex	PM-1	Dual ported	Powered	50 Hz-20 kHz (±2 dB)	Max >118 dB ELM	3 kHz	6.5"
Fostex	PS-3.1	Sub: ported bass reflex; satellites: sealed full range	Powered	80 Hz–20 kHz	60 mV	N/A	5.25" cone in sub
Fostex	SPA-11	Sealed; dual cone	Powered	60 Hz–18 kHz	92 dB/1W	N/A	N/A
Galaxy	Hotspot Chameleon HF	Ported	Unpowered	50 Hz–29 kHz (±6 dB)	0.92 dB	N/A	5" poly paper woofer
Genelec	1029AP	Ported	Powered	68 Hz–18 kHz (±2.5 dB)	110 dB peak/pair	3.3 kHz electronic	5" coated cone
Genelec	1030AP	Ported	Powered	52 Hz–18 kHz (±2.5 dB)	115 dB peak/pair	3.5 kHz electronic	6.5" polymer composite
Genelec	2029A Digital Monitor System	Ported	Powered	68 Hz–18 kHz (±2.5 dB)	110 dB	3.3 kHz electronic	5" coated cones
Genelec	2029B Digital Monitor System	Ported	Powered	68 Hz–20 kHz	110 dB peak/pair	3.3 kHz	5" coated paper
Genelec	7050A Subwoofer	Laminar spiral	Powered	38-85 Hz	N/A	85 Hz	8"
Genelec	7060A Subwoofer	Laminar spiral	Powered	28-85 Hz	N/A	85 Hz	10"

MIDRANGE SIZE AND TYPE	TWEETER SIZE AND TYPE	MAGNETIC SHIELDING	CABINET DIMENSIONS (HXWXD)	WEIGHT (LBS.)	NOTES	PRICE (PER PAIR)
N/A	N/A	No	16x24x21	69.3		$2,200 each
N/A	1"	No	8x18x12	31		$3,199
N/A	3/4" soft dome	Yes	7.75x10.5x12.25	17.6	Digital input; USB, (2) stereo analog inputs	$595
N/A	N/A	Yes	4.75x5.81x7.81	R 2.4, L 1.1	Compact	$85
N/A	N/A	Yes	4.75x5.81x7.81	R 2.4, L 1.1	Compact	$105
N/A	2"	Yes	6.19x7.81x9.37	R 7.9, L 5.2	Front: headphone out; rear: stereo 1/8" and RCA	$135
N/A	2"	Yes	6.19x7.81x9.37	R 7.9, L 5.2	S/PDIF (coax, optical) I/O, headphone out; rear: stereo 1/8" and RCA	$175
N/A	1.18" cone	Yes	5.75x7.75x9.65	11.1		$185
N/A	1.18" soft dome type	Yes	5.75x7.75x9.65	11.1	Digital input 24-bit, S/PDIF, USB (2) stereo analog inputs	$245
N/A	1" titanium dome tweeter	Yes	12.2x6.9x8.5	8.5	Shielded, dual woofer	$340
N/A	1" titanium dome	Yes	16.5x9x11.75	12	Shielded, dual woofer	$580
N/A	1"	Yes	9.8x7.0x5.9	5.7		$418
N/A	1" ferrofluid-cooled silk dome	Yes	14.75x10.25x 11.75	22	Front-mounted lrg-diam port, 5-wy binding posts	$399
N/A	N/A	Yes	19.25x22.25x13.5	65	250W linear amplifier, 112 dB max SPL; Full bass management system with continuously variable phase and monitor blend crossover tuning	$899 each
N/A	N/A	Yes	29x21.5x17.5	88	250W linear amplifier, 117 dB max SPL; Full bass management system with continuously variable phase and monitor blend crossover tuning	$1,199 each
N/A	1" ferrofluid-cooled silk dome	Yes	14.75x10.25x11.75	30	200W per side; low/high freq & trim controls; subsonic filter; RF prot; gold 1/4"/XLR combo	$999
N/A	1" ferrofluid cooled natural soft dome neodymium	Yes	10.5x7.5x9	16.5	100W per side; balanced gold XLR and 1/4" inputs; front-panel volume control; RF interference protection; power-on/clip LED indicator; subsonic filter	$599
N/A	1" ferro-fluid cooled natural silk dome	Yes	12.5x8.25x10	23	100W per side; balanced gold XLR and 1/4" inputs; input level control; RF interference protection; power-on/clip LED indicator; subsonic filter	$699
N/A	1" ferro-fluid cooled natural silk dome	Yes	14.75x10.25x11.75	26.5	100W per side; balanced gold XLR and 1/4" inputs; input level control; RF interference protection; power-on/clip LED indicator; subsonic filter	$849
N/A	.75" Mylar cone	Yes	10.1x6.4x6.2	7	Available in 4 or 16 Ω models; white or dark grey finish; wall-/mic stand-mountable w/opt mounts	$1,299
N/A	.75" Mylar cone	Yes	10.1x6.4x6.2	9	Built power 60W power amp; 1/4" TRS bal input jack, aux out; gain/vol/tone control; white or dark grey; wall /mic stand mountable, w/optl mounts	$189
N/A	1.25" Mylar cone w/aluminum flat wound voice coil	Yes	16.9x11.4x11.2	23	1/4" TRS balanced input jacks; white or dark grey	$339
N/A	1.25" Mylar cone w/aluminum flat wound voice coil	Yes	16.9x11.4x11.2	33	1/4" TRS balanced input jacks; 1/4" aux out jack; gain/volume control; 2-band EQ; ground lift switch; white or dark grey	$419
4" full-range	N/A	Yes	6.5x4x5	7	Amplifier may be used independently	$189 each
N/A	1" soft dome	Yes	13.4 x10.8x10.8	20	'Hyperbolic parabolic' diaphragm for woofer, URD tangential diaphragm edge, push-pull damper, time-aligned encl	$1,198
N/A	1" soft dome	Yes	13.4x.5x12.6	24	Biamped w/2 60W amps, adj. boost/cut @ 60 Hz & 10 kHz, 3 dB attenuator at 3 kHz, tweeter level adj. ± 3dB	$1,998
N/A	1" soft dome	Yes	15x8.5x10	24	75-45W biamplified, shielded	$499
3" full-range cone in each satellite	N/A	Yes	10x11.25x 8.25 (subwoofer), 7.25x6-.56x4.69 (satellites)	14	Woofer contains 15W amp; x-over, 5W amps x2 for satellites	$349 (for entire system)
2x 4" full-range cones	N/A	No	7x12x7	16.75	100W internal amplifier, mic and line inputs, level control, daisy-chainable and stackable	$499 each
N/A	1" ferro fluid cooled soft cloth dome tweeter	No	6.75x10.94x6	6	High fidelity, permanent installation loudspeaker	$338
N/A	0.75" metal dome	Yes	10x6x7.25	12.5	XLR ins; power indicator; input-sens controls; amp/driver-prot, x-overs; EQ	$1,080
N/A	0.75" metal dome	Yes	12.5x8x9.5	15	XLR ins, power indicator, input-sens controls; amp/driver-prot, x-overs; EQ	$2,098
N/A	0.75" metal dome	Yes	10x6x7.25	12.5	S/PDIF and XLR ins, all features of 1029A	$1,325
N/A	0.75" metal dome	Yes	9.75x6x7.25	12.5	24-bit/96 kHz digital interface	$1,375
N/A	N/A	Yes	16.13x13.75x12.38	33	For use with 1029A/2029A	$750 each
N/A	N/A	Yes	20.75x18.19x14.19	57	Integrated 6.1 bass manager	$1,595 each

SEE PAGE 174 FOR A COMPLETE LISTING OF MANUFACTURERS' CONTACT INFORMATION

REFERENCE MONITORS

MANUFACTURER	PRODUCT	ENCLOSURE TYPE	POWERED/ UNPOWERED	FREQUENCY RESPONSE	SENSITIVITY	CROSSOVER FREQUENCY	WOOFER SIZE AND TYPE
Genelec	7070A Subwoofer	Laminar spiral	Powered	18-85 Hz	N/A	85 Hz	12"
Genelec	7071A Subwoofer	Laminar spiral	Powered	18-85 Hz	N/A	85 Hz	Dual 12"
Hafler	M5	MDF cabinet	Unpowered	N/A	N/A	3.2 kHz	5.25" polypropylene cone
Hafler	TRM6.1	Bass reflex	Powered	55 Hz–21 kHz ±2 dB	N/A	3.2 kHz	6" polypropylene cone
Hafler	TRM8.1	Bass reflex	Powered	45 Hz–21 kHz ±2 dB	N/A	2.5 kHz	8" polypropylene cone
Hafler	TRM10.1	Bass reflex	Powered	30–110 Hz ±2 dB	N/A	Variable 40-110 Hz	Down firing 10" cellulose fiber cone
Hafler	TRM12.1	Bass reflex	Powered	25–110 Hz ±2 dB	N/A	Variable 40-110 Hz	Down firing 12" cellulose fiber cone
HHB	HHB Circle 3	2-way non-ported	Active & passive	70 Hz–20 kHz	83 dB	3.5 kHz	4.5" NRSC cone
HHB	HHB Circle 5	Ported	Active & passive	48 Hz–20 kHz	87 dB	2.6 kHz	8" polymer cone
HHB	HHB Circle Sub	Twin chamber reflex	Powered	33 Hz–120 kHz	1V	5 main ch use Sallen & Key filters @ 120 Hz	12" double magnet
Hot House	ARM 265	6th-order reflex; rear ported	Bi-amped	30 Hz–20 kHz (±1.75 dB)	Adjustable input gain +4 or -10 line level	1.5 kHz	2x6.5" long throw
Hot House	ASB 310 Sub-Bass System	N/A	Powered	20–80 Hz	N/A	80 Hz	10" ultra-high excursion w/2x10" passive radiators
Hot House	PRM 165	Reflex, rear ported	Unpowered	49 Hz–20 kHz (±1.75 dB)	91 dB	2.4 kHz	6.5" long throw
JBL	4206	Bass reflex	Unpowered	65 Hz–20 kHz (±2 dB)	87 dB	2.8 kHz	6.5" woofer
JBL	4208	Bass reflex	Unpowered	60 Hz–20 kHz (±2 dB)	89 dB	2.8 kHz	8"
JBL	4408A	Bass reflex	Unpowered	50 Hz–20 kHz (±2 dB)	89 dB	2.5 kHz	8" cast frame
JBL	4410A	Bass reflex	Unpowered	45 Hz–20 kHz (±2 dB)	90 dB	900 Hz, 4 kHz	10" cast frame
JBL	4412A	Bass reflex	Unpowered	45 Hz–20 kHz (±2 dB)	89 dB	850 Hz, 4 kHz	12" cast frame
JBL	Control 1	Bass reflex	Unpowered	70 Hz–20 kHz (-10 dB)	87 dB	6 kHz	5.25"
JBL	LSR12P	Subwoofer	Powered	28–80 Hz (-6 dB)	96 dB	85 Hz	12" neodymium differential drive
JBL	LSR25P	Die-cast aluminum	Powered	70 Hz–20 kHz (+1, -2dB)	96 dB @ +4 dBu-10 dBv	2.3 kHz	5.25 SFG
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
KRK	Exposé E8	Tuned port	Powered	100 Hz–4 kHz (±1 dB) 46 Hz–22 kHz (±2.5 dB)	+6 to -30 dB	1.7 kHz	8" Kevlar
KRK	K-Rok/S	Tuned port	Unpowered	57 Hz–19 kHz (±3 dB)	92 dB	2.5 kHz	7" latex-coated, long stroke
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	Rokit Personal Shielded Monitor	Tuned port	Unpowered	69 Hz–24 kHz (±2 dB)	91 dB	1.5 kHz	6.5" long stroke polyvinyl
KRK	S8	Slotted port	Powered	N/A	N/A	N/A	8" coated paper
KRK	S10	Tuned port	Powered	30 Hz–50 kHz -130 kHz (variable)±2 dB	+6 to -30 dB	80 kHz fixed	10" woven kevlar
KRK	S12	Slotted port	Powered	31 Hz–50 kHz (variable)±2 dB	N/A	N/A	12" woven kevlar
KRK	V4	Slotted port	Powered	N/A	N/A	N/A	4" coated
KRK	V6	Tuned port	Powered	30 Hz–50 kHz, -130 Hz (vari) ±2 dB	+6 to -30 dB	80 Hz fixed	10" woven kevlar
KRK	V8	Tuned port	Powered	47 Hz–23 kHz (±2 dB)	+6 to -30 dB	1.66 kHz	8" woven kevlar
KRK	V88	Tuned port	Powered	35 Hz–2 kHz (±2 dB)	+6 to -30 dB	1.83 kHz	8" woven kevlar
Mackie Designs	HRS 120 Studio Subwoofer	N/A	Powered	21-150 Hz ±1.5 dB	N/A	55-110 Hz @ 24 dB	12" RCF precision with 4" voice coil
Mackie Designs	HR624	Bass reflex/passive radioid	Powered	52 Hz-QQQ	N/A	3 kHz	6.7"
Mackie Designs	HR824	Sealed	Powered	39 Hz–20 kHz (±1.5 dB)	>120 dB 1W/1m	2 kHz	8.75" mineral-filled polypropylene cone
M Audio	SP 5B	Ported reflex	Powered	48 Hz-22 kHz	200 mV	2.7 kHz	5.25" magnetically-shielded polypropylene 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	24.63x21.88x19.31	110	Integrated 6.1 bass manager	$2,250 each
N/A	N/A	Yes	28.75x31.63x19.31	178	Integrated 6.1 bass manager	$3,500 each
N/A	Proprietary 25mm silk dome	Yes	12.25x6.75x7	10	4th order Butterworth vented 2-way	$249
N/A	1" soft dome	Yes	13.25x8.875x11.5	25	150W + 33W trans*ana amps	$998
N/A	1" soft dome	Yes	15 7/16x10.25x13	35	150W + 75W trans nova amps	$1,498
N/A	N/A	No	14.75x16x16	60	200W class G trans*ana ampl; XLR, RCA ins; 90/180/270 dgr phsng	$599 each
N/A	N/A	No	18x19.5x19.25	96	200W class G trans*ana ampl; XLR, RCA ins; 90/180/270 dgr phsng	$699 each
N/A	1" softdome neodymium magnet	Yes	10.6x6.9x7.8	8.1 passive; 11 active	Active amp w/anti thump circ	$799 active; $429 passive
N/A	1" softdome with damping chamber	Yes	16.5x10x11.8	10 passive; 12.6 active	Active version: 2 ch amp Class AB	$1,490 active; $749 passive
N/A	N/A	No	18.3x16.3x16.3	47.3	Built in 5 ch active filtering	$1,399
N/A	1" recessed soft dome	No	25x14x12	52	Vertically aligned; adj LF/HF; pk SPL per pair 126 dB; avail in black, red, golden oak	$6,499
N/A	N/A	No	15x15x16	58	Stereo x-over w/ XLR & RCA I/O; HP outs; sens/lvl mtchng; pk SPL 118 dB	$2,499
N/A	1" recessed soft dome	Yes	12.5x8.5x13	25	Req 100-300W of hi qlty amplification for ruler-flat mastering performance	$1,299
N/A	1" titanium	Yes	15.375x9x9.5	15	Multiradial baffle	$410
N/A	1" titanium	Yes	17.75x11.25x9.5	20.5	Multiradial baffle	$540
N/A	1" titanium dome	No	17.25x11.625x12	26	Mirror image pairs	$750
5" cast frame	1" titanium dome	No	23.5x14.25x11.25	43	Mirror image pairs	$1,040
5" cast frame	1" titanium dome	No	14.25x23.5x11.25	47	Mirror image pairs in horizontal configuration	$1,560
N/A	0.75" polycarbonate	Yes	9.25x6.25x5.625	4	Multimedia brackets and adapters available	$328
N/A	N/A	No	15.5x25x11.5	50	Integrated bass management system	$1,279
N/A	1" titanium composite with waveguide	Yes	10.6x 6.8x9.5	17		$798
N/A	1" titanium composite on waveguide	No	13x16x12.75	50	Carbon fiber composite baffle	$2,358
5" neodymium w/2" voicecoil	1" titanium composite on waveguide	No	15.5x25x11.5	47	Carbon fiber composite baffle	$2,358
N/A	1" kevlar	Standard	17x15.25x14.5	61		$4,799
N/A	1" silk dome	Optional	14x12x9.75	46 (pair)		$599 ($750 shielded)
N/A	1" kevlar	Optional	13x9x10	36		$1,050 ($1,200 shielded)
N/A	1" kevlar	Optional	14.25x11x11	50		$1,500 ($1,800 shielded)
N/A	1" silk dome	Yes	12.5x10.5x8	29 (pair)		$450
N/A	N/A	No	N/A	N/A		$850
N/A	N/A	No	13x18.75x17	53 (pair)		$1,200
N/A	N/A	No	15x22x20	72		$1,499
N/A	1" titanium dome	Yes	N/A	N/A		$1,000
N/A	N/A	No	13.017x18.75x17	53 (pair)		$1,200
N/A	1" silk dome	Yes	N/A	38 (pair)		$1,800
N/A	1.25" silk dome	Yes	N/A	50 (pair)		$2,400
N/A	N/A	No	21x18x21.3	94	Biamplified	$1,499
N/A	1" viscous edge-damped aluminum dome	Yes	13x8.25x10.3	51	Biamplified	$1,298
N/A	1" alumin-alloy; ferrofluid cooled coil	Yes	15.75x10x10.5	32	Rear mass-loaded passive radiator	$1,598
N/A	1" silk dome	Yes	6.5x10x7.75	11		$400

SEE PAGE 174 FOR A COMPLETE LISTING OF MANUFACTURERS' CONTACT INFORMATION

REFERENCE MONITORS

MANUFACTURER	PRODUCT	ENCLOSURE TYPE	POWERED / UNPOWERED	FREQUENCY RESPONSE	SENSITIVITY	CROSSOVER FREQUENCY	WOOFER SIZE AND TYPE
M Audio	Studiophile SP 5B	Ported reflex	Powered	38 Hz-22 kHz	200 mV	2.7 kHz	5.25" polypropylene
M Audio	Studiophile SP 8B	Ported reflex	Powered	33-22k Hz	200 mV	1.8 kHz	8" polypropylene
M&K Professional	MPS-300	In-wall	Unpowered	80 Hz-22 kHz (±2 dB)	N/A	1.2 kHz	(2) 5.25" poypropylene mid-woofers
M&K Professional	MPS-1525 Tripole Surround	Sealed	Unpowered	80 Hz–20 kHz	90 dB	1.8 kHz	(2) 5.25"
M&K Professional	MPS-1625 Tripole Surround	Sealed	Unpowered	80 Hz–20 kHz	90 dB	1.8 kHz	6.5"
M&K Professional	MPS-1625P Tripole Surround	Sealed	Powered	77 Hz–20 kHz	90 dB	1.8 kHz	6.5"
M&K Professional	MPS-1510	Sealed	Unpowered	80 Hz–20 kHz	90 dB	1.8 kHz	5.25"
M&K Professional	MPS-1520 Center Channel	Sealed	Unpowered	80 Hz–20 kHz	90 dB	1.8 kHz	(2) 5.25"
M&K Professional	MPS-1610	Sealed	Unpowered	80 Hz–20 kHz	90 dB	1.8 kHz	6.5"
M&K Professional	MPS-2510	Sealed	Unpowered	77 Hz–20 kHz (±2 dB)	90 dB	1.5 kHz	(2) 5.25"
M&K Professional	MPS-2510 Powered	Sealed	Powered	77 Hz–20 kHz (±2 dB)	90 dB	1.5 kHz	(2) 5.25"
M&K Professional	MPS-2525 Tripole Surround	Sealed	Unpowered	80 Hz–20 kHz	90 dB	1.8 kHz	(2) 5.25"
M&K Professional	MPS-2525P Tripole Surround	Sealed	Powered	77 Hz–20 kHz	90 dB	1.8 kHz	(2) 5.25"
M&K Professional	MPS-2550	Sealed	Unpowered	77 Hz–20 kHz (±2 dB)	90 dB	200 Hz, 1,500 Hz	(2) 6.5"
M&K Professional	MPS-2575 Tripole Surround	Sealed	Unpowered	80 Hz–20 kHz	90 dB	1.8 kHz	(2) 6.5"
M&K Professional	MPS-2810 Subwoofer	Sealed	Powered	20–125 Hz	N/A	N/A	(2) 8"
M&K Professional	MPS-5150 Subwoofer	Sealed	Powered	20–125 Hz	N/A	N/A	(2) 12"
M&K Professional	MPS-5310 Subwoofer	Sealed	Powered	20–125 Hz	N/A	N/A	(2) 12"
M&K Professional	MPS-5410 x Subwoofer	Sealed	Powered	18–125 Hz	N/A	N/A	(2) 12"
NHT Pro	A-10	Sealed	Dedicated outboard amplifier	50 Hz–20 kHz	116 dB	2 kHz	6.5" paper cone
NHT Pro	A-20	Sealed	Dedicated outboard amplifier	40 Hz–20 kHz	117 dB	2 kHz	6.5" paper cone
NHT Pro	B-20	Air suspension	Powered	29–100 Hz	N/A	5 position variable 70, 85, 95, 105, bypass (230 Hz)	(2) 10" ultra long throw (1" linear peak-peak)
NHT Pro	C-20	Acoustic suspension	Powered	48 Hz–20 kHz	N/A	N/A	6.5" treated paper (shielded)
NHT Pro	M-00	Sealed, cast aluminum	Powered	80 Hz–20 kHz	111 dB	N/A	4.5" paper cone
NHT Pro	S-00	Acoustic suspension	Powered	39 Hz–90 Hz	N/A	Varable 50–90 Hz	8" long throw, treated paper
Paradigm Reference	Mini Monitor	Bass reflex	Unpowered	43 Hz–20 kHz (±2 dB)	89 dB	2 kHz	6.5" injection molded copolymer polypropylene
Paradigm Reference	Monitor 3	Bass reflex	Unpowered	36 Hz–20 kHz (±2 dB)	90 dB	2 kHz	8" injection molded copolymer polypropylene
Paradigm Reference	Studio/20	Bass reflex	Unpowered	38 Hz–22 kHz (±2 dB)	89 dB	1.5 kHz	6.5" mica-polymer cone
PMC	IB-1	Transmission line	Unpowered	25 Hz–25 kHz	91 dB	380 Hz, 3.8 kHz	10" flat carbon fiber; Nomex piston driver
PMC	PMC IB-1S	Transmission line	Option	25 Hz–25 kHz	89 dB	380 Hz, 3.8 kHz	10" flat carbon fiber; Nomex piston driver
PMC	PMC LB-1	Transmission line	Option	35 Hz–25 kHz	87 dB	2.5 kHz	4.5" 1 kw pulse with 4" voice coil
PMC	TB-2S	Transmission line	Powered (unpowered avail)	35 Hz–25 kHz	90 dB	3 kHz	6.5" domed-cast magnesium
PMC	XB-1P Subwoofer	Transmission line	Powered (unpowered avail)	25–200 Hz	90 dB	100 Hz	Die-cast 10" dual voice coil
Precision Systems	T16 Active	Ported	Powered	80 Hz–20 kHz	83 dB	2.8 kHz	6" ATC proprietary
Quested	F 11a	Bass reflex	Powered	65 Hz–20 kHz (±2 dB)	N/A	N/A	6.5" custom
Quested	F11p	Bass reflex	Unpowered	65 Hz–20 kHz	84.5 dB	N/A	6.5" custom

MIDRANGE SIZE AND TYPE	TWEETER SIZE AND TYPE	MAGNETIC SHIELDING	CABINET DIMENSIONS (HXWXD)	WEIGHT (LBS.)	NOTES	PRICE (PER PAIR)
N/A	1" magnetically shielded silk dome	Yes	9.8x6.5x7.87	11		$399
N/A	1" magnetically shielded silk dome	Yes	14.96x9.8x11.81	11		$599
N/A	(2) 1" soft dome; 1" ferrofluid open-back transmission line	No	12.1x10.5x3.1	N/A	In-wall studio monitor with white metal grill	$999 each
(2) 3.5"	1" soft dome	Yes	10.5x8.5x6	11	Switchable power response	$1,399
(4) 3.5"	1" soft dome	Yes	12.6x10.5x8	14	Switchable power response	$1,998
(4) 3.5"	1"	Yes	12.6x10x9	18	Switchable power response	$2,499
N/A	1" soft dome	Yes	10.5x6.25x7.4	9		$499 each
N/A	1" soft dome	Yes	5.6x6.18.5x8.25	17	Horizontal center channel monitor	$699 each
N/A	1" soft dome	Yes	12.6x18.4x7.5	12		$650 each
N/A	(3) 1" soft dome	Yes	12.5x10.5x12	24	THX PM3 appr; user selectible wide/narrow vertical directivity	$899 each
N/A	(3) 1" soft dome	Yes	12.5x10.5x12	24	THX PM3 appr; user selectible wide/narrow vertical directivity	$1,999 each
(4) 3.5"	(3) 1" soft dome	Yes	12.5x10.5x12	26	Tripole surround monitor; switchable power response	$1,399
(4) 3.5"	(3) 1"	Yes	12.5x10.5x14	26	Switchable power response	$2,999
(2) 5.25"	(3) 1"	Yes	12.5x10.5x14	32	User selectible vertical directivity	$1,399 each
(2) 5.25"; (2) 3.5"	(5) 1" soft dome	Yes	12.375x10.5x14	36	Tripole surround monitor; switchable power response	$1,799 each
N/A	N/A	Yes	14.5x17.5x12.125	41	Dual driver push-pull; headroom maximizer; backfire dsgn	$1,499 each
N/A	N/A	Yes	23.25x15.5x19.625	72	Dual driver push-pull; headroom maximizer; XLR in; THX PM3 appr	$1,499
N/A	N/A	Yes	23.25x15.5x19.625	82	Dual driver push-pull design; headroom maximizer; XLR in; THX PM3 appr	$1,999
N/A	N/A	Yes	23.25x15.5x26	115	Dual driver push-pull design; headroom maximizer; XLR in; THX PM3 appr	$2,999
N/A	1" ferrofluid cooled soft dome	Yes	12x7.5x10.75 Amp dimensions: 3.5x19x12.75 (2u)	14	XLR/TRS in; output (amp-monitors)-XLR cables; controls listening position-NF/MF, wall prox-0/1, input sensi—10/-3/+4,+11 dBu, mute	$1,200
N/A	1" ferro fluid cooled, metal dome	Partial	3.5x19x12.75 (2u)	17	XLR/TRS in; output (amp-monitors)-XLR cables; controls listening position-NF/MF, wall prox-0/1, input sensi—10/-3/+4,+11 dBu, mute, LED readout-SPL, VAC, heat sink temp.	$2,000
N/A	N/A	No	(2) 14x14x16 (inc. grill)	38	Includes 250W/ch control amplifier	$2,000/system
N/A	1" aluminum dome; . fluid cooled; shielded	Partial	14x8x9.375	19	Center channel complement for A-20 system	$1,250
N/A	1" ferrofluid cooled; soft dome	Full, including transformer	9x5.7x7.3	14	Inputs: XLR, TRS, RCA; controls-NF/MF, +4/-10 dBu, auto power	$750
N/A	N/A	No	13.25x10.25x13	30	Optional footswitch bypass	$750 each
N/A	1" pure titanium dome	Optional	13.25x8x11.25	15.5	Black ash, light cherry, and dark cherry laminates	$349
N/A	1"pure titanium dome	Optional	20x9.19x11.37	24	Black ash, light cherry, and dark cherry laminates	$399
N/A	1" pure aluminum dome	Optional	14.5x8.25x11.37	28	Black ash, light cherry, and rosenut laminate and wood veneer	$650 laminate, $900 veneer
3" fabric dome	Silk soft dome with double chamber	Optional	30x13x21	65	Available in several finishes	$5,900
5.5" dome fabric	3.5" silk dome w/double chamber	Optional	29x18x13	76	Optional Bryston power modules	$4,950
N/A	Silk soft dome w/double chamber	Yes	21x10x7	21	Optional Bryston power modules	$2,360
N/A	Aluminum alloy phase shield ferrofluid	Optional	15.75x7.5x11.75	Powered: 30; unpowered: 20	Available in several finishes	$900 and up
N/A	N/A	No	31x17x10.5	Powered: 71; unpowered: 60	Available in several finishes	$1,250 and up
N/A	1"	Optional		40		$3,800
N/A	1.10" soft dome	Yes	12.5x8.5x11.25	24.5	Bass/treble boost/cut, level control	$,2190
N/A	1.10"	Yes	12.5x9x11.5	26	Integral mounting points	$1,390

SEE PAGE 174 FOR A COMPLETE LISTING OF MANUFACTURERS' CONTACT INFORMATION

REFERENCE MONITORS

MANUFACTURER	PRODUCT	ENCLOSURE TYPE	POWERED/ UNPOWERED	FREQUENCY RESPONSE	SENSITIVITY	CROSSOVER FREQUENCY	WOOFER SIZE AND TYPE
Quested	H108	Bass reflex	Unpowered	55 Hz–18 kHz	90.5 dB	N/A	8" custom
Quested	VH2108		Unpowered	55 Hz-17 kHz +/-1.5 dB	90.5 dB @ 1W 1m	N/A	8" high excursion
Quested	VH3208	Bass reflex	Unpowered	45 Hz–20 kHz (±2 dB)	92 dB	N/A	2x8" custom
Quested	VS2108	Bass reflex	Powered	55 Hz–19 kHz (±2 dB)	N/A	N/A	8" custom
Quested	VS2205	Bass reflex	Powered	75 Hz–19 kHz	N/A	N/A	2x5" custom
Roland	DS-90 24-bit Digital	Bass reflex	Powered	Flat, w/user-adjustable settings	0 dBm (0.775 Vrms)	2.6 kHz active 4th order	6.5" polypropylene cone
Samson	DMS80		Powered w/2x40 W amp included	40 Hz–18 kHz	N/A	N/A	5.25"
Samson	Resolv 65	Ported tuned	Powered	40 Hz-20 kHz	N/A	2.6 kHz	6.5" copolymer surround
Samson	Resolv 65a	Ported tuned	Powered	40 Hz-20 kHz		2.6 kHz	6.5" copolymer surround
SPL Electronics	Sigma 6.2	Ported	Unpowered	40 Hz-40 kHz	87 dB, 1W/1m	N/A	6.5"
Studer	Active A1	Ported	Powered	58 Hz–22 kHz	0.775V for 100 dB SPL @1m	3.5 kHz	5.6"
Studer	A3 Active	Ported	Powered	43 Hz–23 kHz	0.775V for 100 dB SPL @1m	2.2 kHz	8.5"
Sundholm Acoustics	Sundholm PS/8 Sub	Ported reflex	Powered	24–100 Hz (±3 dB), 28–100 Hz (±1 dB)	N/A	50–100 Hz variable	8" treated paper cone
Sundholm Acoustics	Sundholm PS/10T Powered Sub	Ported reflex	Powered	34 Hz–100 kHz (±3 dB)	N/A	50–100 Hz variable	10" polycone
Sundholm Acoustics	SL 5.0	Ported reflex with wave guide	Unpowered	56 Hz–20 kHz (±3 dB), 150 Hz–20 kHz (±1 dB), 24—28 Hz–20 kHz (±1 dB)	87dB	3.2 kHz	5.25" coated paper cone fully shielded
Sundholm Acoustics	SL 6.5	Ported reflex	Unpowered	45 Hz–20 kHz (±2 dB)	88 dB	2.5 kHz	6.5" polycone
Sundholm Acoustics	SL 8.0	Ported reflex	Unpowered	40 Hz–20 kHz (±3 dB)	88 dB	2.2 kHz	8" polycone
Tannoy	Proto-J	Ported reflex	Unpowered	60 Hz-20 kHz	87 dB	3 kHz	6.5" pulp
Tannoy	PS110B	Ported reflex	Powered	31-150 Hz	N/A	Variable	10" pulp
Tannoy	PS350B	Ported reflex	Powered	29-300 Hz	N/A	Variable	15" treated pulp
Tannoy	Reveal	Ported reflex	Unpowered	65 Hz-20 kHz	87 dB	3 kHz	6.5" plastic
Tannoy	Reveal Active	Ported reflex	Powered	62 Hz-20 kHz	N/A	3 kHz	6.5" plastic
Tannoy	System 600	Ported reflex	Unpowered	52 Hz-20 kHz	90 dB	1.8 kHz	6.5" molded plastic
Tannoy	System 600A	Ported reflex	Powered	44 Hz-20 kHz	N/A	1.6 kHz	6.5" molded plastic
Tannoy	System 800	Ported reflex	Unpowered	47 Hz-20 kHz	92 dB	1.8 kHz	8" molded plastic
Tannoy	System 800A	Ported reflex	Powered	44 Hz-20 kHz	N/A	1.6 kHz	8" molded plastic
Tannoy	System 1000	Ported reflex	Unpowered	45 Hz-20 kHz	94 dB	1.5 kHz	10" molded plastic
Tannoy	System 1200	Ported reflex	Unpowered	40 Hz-20 kHz	95 dB	1.3 kHz	12" molded plastic
Triple P	Pyramid	Sealed	Unpowered	80 Hz-18 kHz	87 dB	N/A	N/A
Vienna Acoustics	Bach	Bass reflex	Unpowered	38 Hz–20 kHz (±3 dB)	90 dB	N/A	7" paper cone
Vienna Acoustics	Haydn	Bass reflex	Unpowered	42 Hz–20 kHz (±3 dB)	89 dB	N/A	5.5" XPP cone
Vienna Acoustics	Mozart	Bass reflex	Unpowered	35 Hz–22 kHz (±3 dB)	90 dB	N/A	2x5.5" XPP cone
Westlake Audio	BBSM-4	Bass reflex	Unpowered	65 Hz–20 kHz	89 dB	1.5 kHz	4" polypropylene
Westlake Audio	BBSM-5	Bass reflex	Unpowered	55 Hz–20 kHz ±3 dB	90 dB	1.2 kHz	5" polyglass
Westlake Audio	Lc265.1	Bass reflex	Unpowered	48 Hz–18 kHz	91 dB	180 Hz, 4 kHz	6.5" polypropylene
Westlake Audio	Lc3w10	Bass reflex	Unpowered	42 Hz–20 kHz	88 dB	160 Hz, 4.5 kHz	10" polypropylene
Westlake Audio	Lc3w12	Bass reflex	Unpowered	40 Hz–18 kHz	91 dB	160 Hz, 4.5 kHz	12" polypropylene
Westlake Audio	Lc 4.75	Bass reflex	Unpowered	60 Hz-20 kHz	85 dB	4.5 kHz	4" polypropylene
Westlake Audio	Lc 5.75	Bass reflex	Unpowered	60 Hz-20 kHz	86 dB	4.5 kHz	5" polyglass
Westlake Audio	Lc6.75	Bass reflex	Unpowered	60 Hz–18 kHz	87.5 dB	4 kHz	6.5" polypropylene
Westlake Audio	Lc8.1	Bass reflex	Unpowered	55 Hz–18 kHz	90.5 dB	3.6 kHz	8" polypropylene
X-Vision Audio	Amber Active	N/A	Powered	38 Hz-2 kHz (+/-2 dB)	91 dB 1W/1m @ 0.5% THD	N/A	10" dual coil, long excursion
X-Vision Audio	Amber HR Active	N/A	Powered	32 Hz-2 kHz (+/-2 dB)	91 dB 1W/1m @ 0.5% THD	N/A	10" dual coil, long excursion
X-Vision Audio	Black HR Active	N/A	Powered	43 Hz-20 kHz (+/-2.5 dB)	89 dB 1W/1m @ 0.35% THD	N/A	6.75" polyprophylen

MIDRANGE SIZE AND TYPE	TWEETER SIZE AND TYPE	MAGNETIC SHIELDING	CABINET DIMENSIONS (HXWXD)	WEIGHT (LBS.)	NOTES	PRICE (PER PAIR)
N/A	1.125" high frequency soft dome	Optional	15x9x9	26		$1,990
N/A	1.125" soft dome ferrofluid cooled	No	13x16x13	42	Easy replace back panel	$2,590
3" custom midrange soft dome	1.125" high frequency soft dome	Optional	24x 9x16.5	84		$4,990
N/A	1.125" high frequency soft dome	Optional	16x13x13	48		$3,990
N/A	1.125" high frequency soft dome	Yes	10x13x11	29		$3,590
N/A	1" soft dome	Yes	19.6x9x12.7	24	24-bit digital ins (S/PDIF) on each speaker	$1,190
N/A	1"	Yes	N/A	N/A		$300
N/A	1" titanium	Yes	13.58x8.5x9.78	N/A		$280
N/A	1" titanium dome	Yes	13.58x8.5x9.78	N/A	Biamp 75W-low/25W-high, adjustable midrange control	$400
N/A	3.25"	Yes	16.75x15.5x9.5	N/A	Time coherent response	$3,000
N/A	2.75"	Yes	9x6x7	11	Negative impedance and group delay compensation	$1,590 ($795 each)
N/A	4"	Yes	16x10x12	28	Negative impedance and group delay compensation	$3,790 ($1,895 each)
N/A	N/A	No	15.25x15.25x15.25	50	Phase reversal switch, stacking outputs ; level control	$820 each
N/A	N/A	No	29x12x15.25	55	Pair serve as speaker stand for full-range monitors	$899 each
N/A	1" aluminum dome; fully shielded	Yes	15x7.75x8	2 each	5.1 mixing system with PS/8 powered sub	$795
N/A	1" silk dome	No	15.5x10.6x11.6	25	Bi-wire connector; time offset correction plate, assym technology	$795
N/A	1" aluminum dome	No	15.5x12x14.25	35	Bi-wire connector; time offset correction plate, Assym technology	$995
N/A	0.75" soft dome	No	14x9x9	12		$279
N/A	N/A	Option	18x12x16	33	110W subwoofer	$499 each
N/A	N/A	Option	20x19x20	61	170W subwoofer	$999 each
N/A	1" soft dome	Yes	14x9x11	15.4		$399
N/A	1" soft dome	Yes	14x9x11	19	50W + 50W	$899
N/A	1" aluminum dome	Option	9x15x11	17	Dual concentric	$695
N/A	1" aluminum dome	Option	9x15x12	23	Dual concentric 70W + 70W	$1,395
N/A	1" aluminum dome	Option	11x18x11	51	Dual concentric	$995
N/A	1" aluminum dome	Option	11x18x12	22	Dual concentric 90W + 90W	$1,895
N/A	1" aluminum dome	Option	13x22x12	37	Dual concentric	$1,795
N/A	1" aluminum dome	Option	16x26x16	60	Dual concentric	$2,495
3x5" paper	N/A	Yes	7.12x7.87x6.5	2.8	Emulates consumer systems	$299
N/A	1" silk dome; ferrofluid	Yes	33.7x7.5x9.8	34		$1,500
N/A	1" silk dome; ferrofluid	No	13.6x6.7x10.2	19		$995
N/A	1" silk dome; ferrofluid	No	37x6.7x11.6	44		$2,500
N/A	0.75" dome	No	8x15x10	31	Electro/mech/acoustical dampening, integrated passive cross-over for single/bi-amp operation	$2,995
N/A	1" soft dome	No	10x18x11.75	42	Electro/mech/acoustical dampening, integrated passive cross-over for single/bi-amp operation	$3,495
5"	1" dome	No	8.5x22x11	42	Electro/mech/acoustical dampening, integrated passive cross-over for single/bi-amp operation	$1,899
5"	0.75" soft dome	No	12.25x21.5x13.37	69	Electro/mech/acoustical dampening, integrated passive cross-over for single/bi-amp operation	$4,125
6"	1" dome	No	15x25x15.5	107	Electro/mech/acoustical dampening, integrated passive cross-over for single/bi-amp operation	$5,087
N/A	0.75 soft dome	Optional	12x5.5x7.25	12		$999
N/A	0.75" soft dome	Optional	14x6.5x9	18		$1,398
N/A	0.75" soft dome	Optional	16x8x10.37	21.5	Electro/mech/acoustical dampening, align signal path	$1,498
N/A	1" dome	Optional	18x10x11.62	31	Electro/mech/acoustical dampening, align signal path	$1,948
N/A	N/A	No	11.5x16.5x12	52	Sub	$1,199 each
N/A	N/A	No	15x19x13.75	63	Sub	$1,399 each
N/A	1" textile dome	Yes	15x8.25x10	18	Biamped, shielded	$1,730

SEE PAGE 174 FOR A COMPLETE LISTING OF MANUFACTURERS' CONTACT INFORMATION

REFERENCE MONITORS

MANUFACTURER	PRODUCT	ENCLOSURE TYPE	POWERED/ UNPOWERED	FREQUENCY RESPONSE	SENSITIVITY	CROSSOVER FREQUENCY	WOOFER SIZE AND TYPE
X-Vision Audio	Blue HR Active	N/A	Powered	37 Hz-20 kHz (+/-2.0 dB)	90 dB 1W/1m @ 0.3% THD	N/A	(2) 7" carbon
X-Vision Audio	Cyan HR	N/A	Powered	36 Hz-20 kHz (+/-2.5 dB)	91 dB 1W/1m @ 0.3% THD	N/A	(4) 7" carbon
X-Vision Audio	Orange HR	N/A	Powered	38 Hz-20 kHz (+/-2.5 dB)	90 dB 1W/1m @ 0.32% THD	N/A	(2) 7" carbon
X-Vision Audio	Owl System	N/A	Powered	42 Hz-20 kHz (+/-1.5 dB)	90 dB 1W/1m @ 0.3% THD	N/A	(2) 7" carbon
X-Vision Audio	Pink TV Active	N/A	Powered	58 Hz-19 kHz (+/-2.5 dB)	89 dB 1W/1m @ 0.4% THD	N/A	5.5" paper carbon
X-Vision Audio	Violett HR Active	N/A	Powered	48 Hz-20 kHz (+/-2.5 dB)	89 dB 1W/1m @ 31% THD	1.2 kHz	7" carbon
X-Vision Audio	Yellow HR	N/A	Powered	38 Hz-1 kHz (+/-2 dB)	93 dB 1W/1m @ 0.5% THD	N/A	(2) 15" paper membrane
Yamaha	MS60S	Bass reflex	Powered	20 Hz–20 kHz	91 dB	2.8 kHz	8" treated paper
Yamaha	MSP5	Bass reflex	Powered	50 Hz–40 kHz	101 dB	2.5 kHz	5" paper cone w/rubber surround
Yamaha	MSP10/10M	Bass reflex	Biamplified	40 Hz–40 kHz (-10dB)	-6 dB to +4 (variable)	2 kHz	8" poly w/rubber surround
Yorkville Sound	YSM-1	Bass reflex	Unpowered	40 Hz–20 kHz	90 dB	2.5 kHz	6.5" stamped, proprietary, foam surround
Yorkville Sound	YSM1I	Ported reflex	Unpowered	40 Hz-20 kHz	90 dB	2.5 kHz	6.5" foam surround
Yorkville Sound	YSM1p	Ported relex	Powered	40 Hz-20 kHz	90 dB	2.5 kHz	6.5" foam surround

By Bill Gibson

CHARACTERISTICS OF A GOOD MIX

Strong and solid—but controlled — lows. It's extremely important to build a mix that's distributed evenly in the lows. If the kick is boosted at 100Hz, the bass should not be boosted at 100Hz—in fact, most likely the bass should be cut at 100Hz. Always consider the ramifications of boosting or cutting the same frequency on two or more instruments. If you're limited on your mixer to simple two- band, fixed frequency cut/boost EQ, you must use good mic choice and technique along with educated EQ choices during recording of tracks.

Mids distributed evenly among various instruments. Too much mid-range results in a "honky" sound. Too few mids results in a hollow, empty sound.

Strong, smooth highs that are easy to listen to. A mix that has one particular high frequency boosted on several instruments can take on an abrasive and irritating character. Highs must be distributed evenly.

Balance. A mix that sounds like it's stronger on one side than the other can be distracting. A good way to check the balance of a mix is on headphones. I'll usually listen to a mix on the phones just before I print the master. Headphone are very telling when it comes to stray instruments that might distract if not placed properly.

Depth. A mix can sound okay if it's two-dimensional (just left-right), but when a mix sounds three-dimensional—or if the sounds seem distributed from near to far as well as left to right—it becomes much more real sounding. Reverb and delays add depth. It's typically best to have one instrument define the near character and one instrument define the farthest character. A simple dry percussion instrument is usually a good choice for the closest instrument. A synth string pad or guitar part might be a good choice for the most distant sounding instrument. These choices are all dependent on the desired musical impact.

Width. A stereo mix is more interesting if there is one or two instruments defining the far left and far right boundaries. These boundaries might be far left and far right, but care must be taken to ensure that the mix sounds good in both mono and stereo. Mixes with boundaries closer in toward the center position—3:00 and 9:00 or 10:00 and 2:00—transfer very well to mono, but they aren't as fun to listen to in stereo.

Momentum. If a song maintains the same intensity and texture from start to finish, it probably won't hold the listener's

MIDRANGE SIZE AND TYPE	TWEETER SIZE AND TYPE	MAGNETIC SHIELDING	CABINET DIMENSIONS (HXWXD)	WEIGHT (LBS.)	NOTES	PRICE (PER PAIR)
N/A	1.1" silk dome	No	19x10x12	40	Biamped	$3,598
(2) 5.5" polypropylene	1.1"	No	26.75x22x15.75	85	Triamped	$6,798
(2) 3.12" paper	1.1"	No	20.5 x 13 x 13.75	50	Triamped	$3,578
N/A	(2) 1.1" silk dome	No	15x15x12	45	Biamped	$3,449
N/A	1" textile neodymium	Yes	11.5x6.75x7.75	11	Biamped; shielded	$1,198
	1.1" silk dome	No	15x8.5x9.75	21	Biamped	$2,650
N/A	N/A	No	26.75x31.5x15.75	85	Sub	$1,599 each
N/A	0.75" horn loaded dome	Yes	17.5x10.5x9.5	22	3-input mixer intergrated	$1,258
N/A	1" titanium dome	Yes	11x6.62x8.75	16.5		$598
N/A	1" titanium dome with waveguide	Yes	16.56x10.4x12.31	44	MSP10 black finish/ MSP10M high gloss maple finish	$1,498/$1,598
N/A	1" soft dome	Optional	16x9.5x9	18	2" forward-firing port; binding posts; available in black or white	$290
N/A	1" dome	Yes	9x10x16	18		$320
N/A	1" soft silk dome	Yes	11x10x16	25	Biamped; environmental control EQ (switchable); XLR and 1/4" TRS inputs; front mounted power and clip lights; user defeatable limiting	$640

SEE PAGE 174 FOR A COMPLETE LISTING OF MANUFACTURERS' CONTACT INFORMATION

interest. As a mixing engineer, you should always strive to give the song the appropriate flow. That might include starting from just one instrument and the lead vocal and building to a full orchestration with exaggerated effects, or it might include subtle changes throughout the song that are barely noticeable but add enough to maintain the listener's interest.

Consistency. A mix is only good if it sounds good on any system it's played on. Too often a mix will sound really good in the studio or on your own recording setup, but when you play the mix in your car, living room, the club sound system, the radio or on your friend's mondo home entertainment complex, it sounds embarrassingly bad. Use near-field reference monitors to monitor most of your mix on and, as a cross-check, include some larger far-field monitors and some very small radio-like monitors in your setup. Being able to check your mix on two or three sets of speakers within your setup can make the difference between good, usable mixes and bad, waste-of-time mixes.

Sounds good in stereo and mono. Continually cross-reference the sound of your mix in stereo and mono. As I've mentioned, an instrument, sound or mix can sound great in stereo but terrible in mono. Some of the slight delay or chorus changes that make a mix sound good in mono make practically no difference to the sound of the mix in stereo. ■

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SEQUENCERS (MIDI AND DIGITAL AUDIO)

MANUFACTURER	PROGRAM	PLATFORM	SIMULTANEOUS MIDI TRACKS	MAXIMUM CLOCK RESOLUTION (PPQN)	QUANTIZATION TYPES	SEQUENCING METHOD	EDITING VIEWS	GRAPHIC FADERS	SYSEX EDITING	LOOPING	# OF AUDIO TRACKS
Cakewalk	Guitar Tracks Pro	Win 98/SE/ME/ 2000/XP	N/A	Sample accurate	N/A	Linear audio recording	Audio edit; mixer	Up to 42	No	Region; sequence	32
Cakewalk	Home Studio 2002	Win 98/SE/ME/ 2000/XP	Unlimited	960	Groove; swing %; tick offset	Linear; pattern	Piano roll; sysx; event; notation; console; studioware; tempo; markers	Unlimited	Yes	Region; groove-clips	Unlimited
Cakewalk	Logic Platinum 5	Win; Mac	Unlimited	960	MIDI; groove templates	Linear	Matrix; event; hyper; transform; score; key; time change	Unlimited	Yes	Yes	96 stereo
Cakewalk	Plasma	Win 98/SE/ME/ 2000/XP	Unlimited	960	Groove; swing by %; tick offset	Linear; pattern	Piano roll; track; loop explorer; loop editor event; console; big time; video; temp	Unlimited	No	Region; groove clips	Unlimited
Cakewalk	Sonar 2.0	Win 98/SE/ME/ 2000/XP	Unlimited	960	Groove; swing by %; offset; randomize	Linear	Piano roll; event list; staff; drum editor; controller; console loop construction; loop explore lyrics; studioware	Unlimited	Yes	Region; clip	Unlimited
Emagic	MicroLogic AV 4.7	Mac; Win 98/ME/ 2000/XP	Unlimited	960	Normal; swing	Linear	List; score; matrix	Yes	No	Yes	16
FASoft	n-Track Studio	Win 95/98/NT	Unlimited	960	Grid	Linear	Timeline; piano roll; events list	Yes	Yes	Yes	Unlimited
Future Retro	Mobius	Hardware	1	16th note	Up to 16th note	Loop-based step	N/A	No	Yes (dumping)	Yes	0
Midisoft	Studio Recording Session 1.0	Win 95	Unlimited	1,000	Percentage	Linear	Notation; MIDI list	Yes	Yes	No	8
MOTU	Digital Performer 3.1	Mac	Unlimited	Config-urable	Input; output; swing; groove; humanize	Linear; pattern	Track overview; graphic; drum editor; event list; notation	Yes	Yes	Yes	Unlimited
MOTU	FreeStyle 2.3 (Mac/PC)	Mac; Win	Trackless	960	Straight; offset	Linear; loop	Piano roll; notation; event list	No	Yes	Yes	0
MOTU	Performer 6	Mac	Unlimited	480	Input; output; swing; groove; humanize; GrooveEditor	Linear; pattern; chunk	Graphic; event list; notation	Yes	Yes	Yes	Up to 8
Musicator	Musicator Win 4.0	Win 95/98/ME/ NT/2000	255	480	Swing; percentage	Linear	Track/passage/bar; roll view; notation; audio; effects	Yes	Yes	Yes	32
Personal Composer	Personal Composer	Win	8, 16, 44	1024	Note-on; note-off	Linear	Page; scroll; split-screen	Yes	No	No	0
PG Music	PowerTracks Pro	Win 3.1/95/NT/ ME/2000/ 2002/XP	48	960	Swing; percentage; randomize	Linear; step	Tracks; audio; mixer; events; bars; roll notation; SysEx editor	Yes	Yes	Yes	Up to 48
Roland	MC-50mkII	Roland S-MRC	8 (32 chan)	96	Grid	Linear; step	Track; event	No	Yes	Yes	0
Steinberg	Cubase SX	Win 2000/XP, Mac OS X	Unlimited	Sample-level	Auto; custom; swing; groove	Linear; loop	Key; piano roll; list; drum; logical; sample; part; loop; score	Unlimited	Yes	Yes	200+
Steinberg	Cubase VST 5.1	Win 95/98/ME/ 2000/XP; Mac OS 9	Unlimited	1,920	Over; note on; interactive; analytic; freeze; groove	Linear; loop	Key; list; score; drum logical; controller	Yes	Yes	Yes	72
Steinberg	Cubasis 3.0	Win 98/ME/ 2000/XP, Mac OS 8.6	+64	384	Normal; over	Linear	Key; list; score	Yes	Yes	Yes	48
Technosaurus	Cyclodon	Hardware 16 step sequencer	N/A	N/A	N/A	16-step	N/A	No	No	Yes	0
Voyetra	Digital Orchestrator Pro	Win 3.1/95/ NT 4.0	Unlimited	1,920	Intensity; sensitivity; offset; inside/outside range	Linear	Graphic controller; MIDI mixer; multitrack; notation; conductor	Yes	Yes	Yes	Unlimited
WinJammer	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
Yamaha	QY 100	Hardware	24	480	Percentage; swing	Linear; pattern	Event list	16	Yes	Pattern section	0
Yamaha	QY 700	Hardware sequencer tone generator	48	480	Percentage; swing; groove templates	Linear; pattern	Piano roll; event list	48	Yes	Track; pattern	0
Yamaha	RM1x	Hardware sequencer	16	480	Grid; percentage; groove templates	Step; real, pattern; linear	Event; track; pattern chain	Yes	Yes	Yes	0
Yamaha	RS 7000	Hardware sequencer TG sampler	16	480	Percentage; swing; groove grid	Linear; pattern	Event list	16	Yes	Pattern section	16
Yamaha	XGworks 3.0	PC	100	480	Strength; sensitivity; swing; gate; velocity	Step; real, pattern; linear	Track view; piano roll; staff; drum; event list	Yes	Yes	Yes	6 stereo

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
Audio only application	2-band EQ, amp sim, chorus, delay, flanger, dynamics processor, limiter, 4-band parametric EQ, pitch shifter, reverb	Yes	No	Formant-preserving	Yes	DirectX	No	No	Import ACID wave files; Revalver SE amp simulator; delay time calc; tuner; support for multi-I/O audio hardware; support for 24-bit/96kHz audio; includes Fruity Loops Express 2.7	$139
Yes	Reverb; chorus; flange; delay; parametric EQ	Yes	Yes	Yes	No	DirectX; DX	No	No	Input monitoring; DD wave loops; AUI; slip editing; ACID file support	$129
Yes	4-band parametric EQ; multieffects	Yes	Yes	Formant preserving; traditional	No	VST, VST2, DirectX, Premier, AudioSuite	No	Yes	8-channel surround in 12 formats, 16 stereo busses; integrated stereo sample editor; OMF and Open TL import/export	$949
Yes	FX pad; parametric EQ; pitch shift, delay; reverb; flange; chorus	Yes	Yes	Yes	11025, 44100, 22050, 48000	DirectX; DXi	No	No	DD audio loops; WAV files; MIDI FX; input monitoring; ACID file support; extra CD of loop content	$49
Yes	2-band EQ; amp sim; chorus; delay; flanger; tape sim; EQ, reverb; parametric EQ; pitch shifter; time stretch	Yes	Yes	Formant-preserving; traditional	On import (if necessary)	DirectX; DX; MFX	No	Yes	Studioware; CAL; video; real-time MIDI plug-ins; control surface support; SMPTE sync; ACID support; sysex librarian; DX soft synths; screen layout input monitroing; WDM driver support; OP panel support	$129
Yes	9 native plug-ins	Yes	No	N/A	Yes	ASIO	No	No	ASIO 2.0; Audiowerk8/2; Direct I/O; MME/Mac AV, real-time seq edit; supports E-magic, ESX24, ESI, EVP88	$99
Yes	Reverb; echo; pitch shift; chorus; EQ	No	Yes	Formant	Yes	DirectX; VST, DXi; VSTi	No	No	Works with WDM and ASIO drivers	$35-$55
No	N/A	No	No	N/A	No	N/A	No	No	Copy/paste pattern shifting; realtime pattern editing; MIDI to control voltage conversion	$325
No	Delay; echo; chorus; flanger; EQ	Yes	No	Traditional	Yes	N/A	No	No	Multisequence playback; articulation marks; more	$150
Yes	50+ native MIDI and audioplug-ins	Yes	Yes	Formant and traditional	Yes	TDM, MAS, Premiere	No	No	MIDI time stamping; MAS plug-in automation; 24-bit waveform editor; support QuickTime	$795
No	N/A	No	No	N/A	No	N/A	No	No	Sense tempo, note-spelling algorithms; step sequencing	$195
Yes	EQ; dyn; chorus, flanger, delay, phase shfter, autopan, echo, trml	Yes	No	N/A	No	MAS	No	No	QuickTime support; Unisyn; custom consoles for Roland VS-880; window sets; WYSIWYG notation editing	$495
Yes	N/A	No	No	N/A	Yes	N/A	No	No	Notation; front-panel controls for GS, XG, SC-88 PRO FX	$299
No	NA	No	No	N/A	No	NA	No	No	Transpose, copy to WP and DTP apps	$70–$200
Yes	Comp; gate; dist; reverb; echo; chorus; flanger; ring mod; trem	Yes	No	N/A	Yes	Proprietary	No	No	Supports MID, .KAR, WAV, MP3, international lang; guitar tuner	$29–$49
No	N/A	No	No	N/A	No	N/A	No	No	2 MIDI outs; 1.4 MB floppy drive, read/write, mid	$795
Yes	Delays, dynamics, de-esser, overdrive, quadra fuzz; flange, phase, rotary, chorus, symphonic, reverb; vocoder, ring mod, SMPTE generator	No	Yes	Yes	Yes	VST, DirectX	No	Yes	Surround sound, unlimited undo/redo, VST system link technology; video track with thumbnail; Apogee UV22 dithering multiple bit depths; multiple projects open	$4,800
Yes	4-band EQ, reverb; chorus, delay, pan; fuzz, special; overdrive; flange	Yes	Yes	Yes	Yes	VST, DirectX	No	Yes	Built-in virtual instruments: JXile, CS40, LM7, UBI, VSM; LTB linear time base for MIDI timing; PIII, PIV, AMD processor optimized; 11 new virtual effects: datube, phatsync, vocoder, more	$500
Yes	Yes, realtime	Yes	Yes	N/A	No	VST, DirectX	No	No	VST instruments; built-in synth bass, drum, universal sound module; MP3 and RealAudio export, mastering and CDR software; surround simulation	$100
No	N/A	No	No	Knobs	No	N/A	No	No	Analog 16-step sequencer	$329
Yes	EQ, dly	Yes	Yes	Traditional	Yes	N/A	No	No	Mixdown; export to ACM-compat, export to any avail codes	$199
No	N/A	No	No	N/A	No	N/A	No	No		$200
No	(3) hardware, (11) reverb, chorus, (43) variation	No	No	N/A	No	N/A	No	No	A/D input with effects for guitar and microphone	$630
No	(3) processors, (63) effects	No	No	N/A	No	N/A	No	No	XG tone generator, phrase database; FDD 2 MIDI outs, pitch and modulation	$1,495
No	(11) reverb, (11) chorus, (43) variation	Yes	Yes	Normal	No	N/A	No	No	654 normal voices; 46 drum kits; 3.5 FDD; SMF compatable; 8 realtime control knobs with 16 parameters	$900
Yes	(4) hardware, (12) reverb, (2) delay/chorus, (100) variation, (8) master	No	Yes	Intellegent Slice Type X	Yes	N/A	Yes	No	Integrated sampling sequencer; AIEB2 output expander; SIMMs expansion	$1,695
Yes	Hardware dependent	Yes	Yes	Normal	Via software (TWE)	Proprietary (hardware)	Yes	Yes	Guitar arranger, auto arranger; XG editor; Voice to score, multiple notation formats	$100

SEE PAGE 174 FOR A COMPLETE LISTING OF MANUFACTURERS' CONTACT INFORMATION

SONIC TREATMENT

MANUFACTURER	MODEL	TYPE	FIRE RATING	DIMENSIONS	SPECIAL FEATURES	PRICE
Acoustical Solutions	AAP Alpha Pyramid	Sound-absorbing foam	Class 2	2'x2' sheets; 2, 3, 4" thick	Matching pattern; variety of colors; NRC 0.70-1.05	$180–$215/box
Acoustical Solutions	AB10-NR Audio-Seal Sound Barrier	Sound-transmission blocker; high temperature–fused vinyl	N/A	54"x60'x0.125" roll	Stops noise from transmitting through walls, floors and ceilings	$1.75–$2.25/sq ft
Acoustical Solutions	AS1, AS2 AlphaSorb Panels	Fabric wrapped wall panels and hanging baffles	Class 1	Any size up to 4'x10'; 1" or 2" thick	NRC 0.80–1.05; 48 colors; custom shapes and cut-outs	$39–$280
Acoustical Solutions	Sonex Acoustical Foam UNX	Polyurethane	Class 2	2'x4' or 4'x4', 2, 3, or 4" thick	Charcoal, beige, and brown	$167 (3"), $169 (2")
Acoustical Solutions	Sonex Acoustical Foam SOC-2	Melamine	Class 1/Class A	2'x4'x2"	White or colortec charcoal	$213–$299
Acoustical Solutions	Sonex Contour Ceiling Tiles	Drop in T-grid or surface mount	Class 1/Class A	2'x2'	White, gray, almond, or black hypalon finish	$374
Acoustical Solutions	Soundtex, Linear II	Fabric wall covering	Class 1	Bolt: 54"x24 yards; linear yard: 54"x36"	35 colors; NRC 0.25; easy to install	$432/bolt, $24/yard
Acoustics First	1014 AcoustiKit	Acoustical room treatment	Class 3	Various	(24) 1'x1' and (6) 2'x2' sections of Cutting Wedge foam; (2) 2'x2' Art Diffusor Model F; (2) 2' Bermuda Triangle Traps; treats 10'x14' room	$398
Acoustics First	Art Diffusor Model C-ADCS	Styrene	N/A	24"x24"x4.5"	Custom colors	$100
Acoustics First	Art Diffusor Model C-ADCT	Thermoplastic	Yes	24"x24"x4.5"	Custom colors	$166
Acoustics First	Art Diffusor Model E	EPS plastic	N/A	15"x15"x9"	Custom colors	$88
Acoustics First	Art Diffusor Model F-ADFS	Styrene	N/A	24"x24"x2"	Custom colors	$100
Acoustics First	Art Diffusor Model F-ADFT	Thermoplastic	Yes	24"x24"x2"	Custom colors	$166
Acoustics First	Art Diffusor Model W	Wood	N/A	15"x15"x9.5"	7 finish choices	$170–$260
Acoustics First	Art Transfusor	2-Dimensional binary array diffusor	N/A	2'x2' ceiling grid	Translucent light and sound diffusion	$166/unit
Acoustics First	Bermuda Broadband Triangle Trap	Corner absorber	Class 1/3	1'x1'x4'	Also avail as bermuda shorts (24") and stand-alone sound cylinde	$42
Acoustics First	Cutting Wedge	Acoustic foam	Class 3	1'x1', 2'x4', 2'x8' sheets; 2", 3", 4" or 6" thickness	Pattern creates extra surface area; available in charcoal, brown, beige, blue, burgundy, and hunter green	$3-$11/sq ft
Acoustics First	Double Duty Diffusor	Polycylindrical diffusor/ bass trap	Class A	2'x2'–4'x8'	Uniform high-frequency dispersion; increases the acoustic size of a mixing room	$200
Acoustics First	Geometrix	Broadband	Class A	8" diam; up to 10' high	Formed fiberglass covered with 1.00 above Guilford FR701 fabrics; 84 absorption at 125 Hz	$157
ASC	Acoustical Soffit System	Absorptive/diffusive soffit	Class 1	Custom	Broadband control	$78/ln ft
ASC	Mix Station	Room acoustic control package	N/A	5'x5' arrays, 6"x60" panels	Low-frequency and reflection control	$1,500
ASC	Monitor Stand Acoustic Control Product	Reference monitor stand	N/A	11, 13, 16, 20" diameters; height varies	Low-frequency control; reduces vertical mode problems	$374-$678
ASC	Quick Sound Field System	Sub-space	N/A		Increase/decrease ambience via placement; adjustable for bright or dead recording	$2,520 and up
ASC	Studio Trap	Adjustable/tunable floor-standing acoustic control device	N/A	9" diameter x 4' tall	Diffusive side and absorptive side; adjustable	$315
ASC	Tube Trap	Bass trap	N/A	9", 11", 13", 16", 20" diameters; 4' tall	Bass absorption down to 30 Hz with built-in diffusion above 400 Hz	$248–$678
ASC	Sound Panel	Acoustic wall panel	Meets code	2"x8"x48"	Controls flutter echo, excess reverb and brightness while maintaining ambiance and presence	$398 (set of 8)
ASC	Sub-Stand Cube	Bass trap/ resonant control	N/A	Standard 17"x17"x9", 24"x24"x9", custom sizes available	Decouples sub; controls vertical resonant mode; improves bass articulation	$399–$499

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Vary the Ratio to select anywhere from gentle down-ward expansion to gating.

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Connect the unit hassle free using either unbalanced or balanced 1 4" TRS or balanced XLR connectors.

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Add processing to detector path (using the sidechain) for frequency-conscious compression/gating/special effects.

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Why do the best ears in the business time and time again turn to dbx for their processing needs? Maybe it's because we invented the modern day compressor. Perhaps it's because we have over 30 patents to our credit. It could that our technology like OverEasy and PeakStopPlus won't be found in any other compressor. However, we think it's because dbx just sounds better.

It's no wonder that countless gold and platinum albums have used dbx processing and that eight out of the top ten U.S. tours use dbx each night because their sound is too valuable to trust to anyone else. But don't take our word for it, head on down to your local dealer today and hear for yourself why dbx just sounds better.

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SONIC TREATMENT

MANUFACTURER	MODEL	TYPE	FIRE RATING	DIMENSIONS	SPECIAL FEATURES	PRICE
ASC	WallDamp IsoWall System	Soundproof wall and ceiling construction kit	Meets fire codes	N/A	Room soundproofing/isolation construction kit for new construction or remodeling	$2–$3/sq ft
Auralex Acoustics	ATOM-12 Corner Treatment Kit	Bass traps	Class B	12"x12"x17" LENRDs, 12"x12"x12" cubes	Kit contains 12 LENRD bass traps and 4 corner fill cubes; 12 colors	$399/kit
Auralex Acoustics	GRAMMA (Gig & Recording Amplifier & Monitor)	Amp and monitor riser	N/A	Decking: 15"x23"x2.5"	Lightweight, portable, standard size fits most amps	$59.95
Auralex Acoustics	MAX-Wall 420	Absorptive foam	Class B	20"x48" panels; 4.37" thick	Portable, expandable, adaptable, interlocking panels, available in 3 colors; includes 4 panels 2 MAX stands & clamps	$349/kit
Auralex Acoustics	MAX-Wall 521	Absorptive foam	Class B	20"x48" panels; 4.37" thick	Portable, expandable, adaptable, interlocking panels; available in 3 colors; incl. 5 panels, 2 MAX stands, 1 MAX-Wall Window kit & clamps	$499/kit
Auralex Acoustics	MAX-Wall 633	Absorptive foam	Class B	20"x48" panels; 4.37" thick	Portable, expandable, adaptable, interlocking panels; available in 3 colors; incl. 6 panels, 3 MAX stands, 3 MAX-Wall Window kits & clamps	$849/kit
Auralex Acoustics	MAX-Wall 831	Absorptive foam	Class B	20"x48" panels; 4.37" thick	Portable, expandable, adaptable, interlocking panels; available in 3 colors; incl. 8 panels, 3 MAX stands, 1 MAX-Wall Window kit & clamps	$749/kit
Auralex Acoustics	MAX-Wall 1141VB	Absorptive foam	Class B	20"x48" panels; 4.37" thick	Portable, expandable, adaptable, interlocking panels; available in 3 colors; incl. 11 panels, 4 MAX stands, 1 MAX-Wall Window kit & clamps	$999/kit
Auralex Acoustics	MAX-Wall Window Kit	Absorptive foam, plexiglas	Class B	20"x48" panel; 4.37" thick; window 8"x49"x25"	Portable, expandable, adaptable, interlocking panels; MAX-Wall panel with plexiglas window; 3 colors	$99/kit
Auralex Acoustics	MoPads	Monitor isolation pads	N/A	12x4x2 w/wedge adjuster	Charcoal; set of 4 monitor pads and 4 wedge adjusters	$29.95/set
Auralex Acoustics	Platfoam	Isolation device	N/A	2"x4"x48"	24 pieces per box charcoal gray only	$179/box
Auralex Acoustics	SheetBlok	Sound barrier	Class B	1/8" thick; 4'x10' and 4'x30' rolls	Approx. 6 dB more effective than solid lead at stopping the transmission of sound	$360/roll
Auralex Acoustics	T'Fusor	For floated drum risers	N/A	23.75" x23.75" square; 5.5" thick	Wall mountable; fits drop ceilings; easily painted; 4 pieces/box	$280/box
Auralex Acoustics	Roominators Alpha 1 Kit	Absorptive foam	Class B	Wedge panels: 1'x1'x2", LENRD: 12"X12"X17" triangle, 24" long	64 Studiofoam wedge panels; 4 LENRD bass traps and 1 can Foamtak spray adhesive; charcoal gray only	$319/kit
Auralex Acoustics	Roominators Deluxe Plus Kit	Absorptive foam	Class B	Wedge panels: 2'x2'x2", LENRD: 12"X12"X17" triangle, T-Fusors: 23.75"x23.75"x5.5"	24 Studiofoam wedge panels; 8 LENRD bass traps and 6 T-Fusor 3D sound diffusors; 2 cans Foamtak spray adhesive; charcoal gray only	$699/kit
Auralex Acoustics	Roominators Project 2 Kit	Absorptive foam	Class B	Wedge panels: 1'x1'x2" LENRD: 12"X12"X17" triangle, 24" long	24 Studiofoam wedge panels; 8 LENRD bass traps and 5 tubes of Tubetak Pro liquid adhesive; charcoal gray only	$429/kit
Auralex Acoustics	Roominators Pro Plus Kit	Absorptive foam	Class B	Wedge panels: 2'x2'x2" LENRD: 12"X12"X17" triangle, T-Fusors: 24"x24"x5.5"	36 Studiofoam wedge panels;12 LENRD bass traps and 8 T-Fusor 3D sound diffusors, 3 cans Foamtak spray adhesive; charcoal gray only	$999/kit
Auralex Acoustics	Stand-Mounted LENRD Bass Traps	Bass traps	Class B	12"x12"x17" triangular, 48" long	12 colors, 4 pieces/box, 4 tripod-style mic stands included, overall NRC 1.35	$319/box
Auralex Acoustics	Studiofoam Metro	Absorptive foam	Class B	2'x4' panels; 2" thick	12 colors, unique "city-scape" profile; seamless installations; 12 pieces/box	$229/box
Auralex Acoustics	Studiofoam Pyramids	Absorptive foam	Class B	2'x4' panels; 2, 4" thick	12 colors, pyramid cut; seamless installations; 6–12 pcs per box; overall NRC 0.70 to 0.95	$279/box
Illbruck	Sonex	Acoustical and sound absorptive foam	Class A/B	2'x4'x2" and up	Many colors and patterns available	$2.50–$6/sq ft

The Fantastic Four

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SONIC TREATMENT

MANUFACTURER	MODEL	TYPE	FIRE RATING	DIMENSIONS	SPECIAL FEATURES	PRICE
Middle Atlantic	Acoustical Panels	Acoustic panel	Class 1 (ASTM E-84)	24"x24", 24"x48", 30"x48", 30"x84"	Faced with 100% polyester fabric; available in grey or beige	$150-$402
Netwell Noise Control	Pyramids	Acoustic foam	Class 1/2	2'x2'x3"	Absorbs 90% of reflected sound	$2–$4/sq ft
Noren	AcoustiLock	Noise reduction cabinet	N/A	14, 20, 24 space racks	Silent cooling	$540/$2,965/$3,215
Primeacoustics	Freeport	Movable baffle	California C117	3"x24"x48", 6' high with stand	Movable panel can be used to create studio anywhere	$149
Primeacoustics	London Studio	Complete studio in a box	California 117	Any size room	Easy to install (comes with the adhesive)	$450 and up
Primeacoustics	Razor Blade	Quadratic diffusor	Wood--not required	8"x24"x48"	True diffusion from 400 Hz-10 kHz	$259
RPG Diffusor	Abffector	Absorbing/diffusion panel	Class A	48"x19"x 6"	Simultaneously offers diffusion and moderate mid-band absorption; internal hinge	$73.50-$82.50
RPG Diffusor	Flatffusor	Flat sound diffsorber	Class A	2'x2' nominal x1"	Omnidirectional diffusion from a thin, flat binary amplitude grating	$138-$162/box
RPG Diffusor	Modex Corner	Pressure zone membrane absorber	Class A	24"x24"x12.25"	Corner wall mounting or freestanding, high bass asorption efficiency, stackable; lightweight	$576-$676/box (2 per box)
RPG Diffusor	ProCorner	Corner-mount foam bass trap	Class A/B/C	48"x1.62"x6.37"	Optimized corner profile, seamless integration with Profoam, NRC 1.0	$271-$454/box (4 per box)
RPG Diffusor	ProFoam	Absorbing foam panel	Class A Melaflex or ClassB/C Polyflex	1'x1'x2", 2'x2'x2", 4'x2'x"	Nestable to any depth required; varible depth air cavity technology	Up to $260
RPG Diffusor	Skyline	2-dimensional diffusor	Class A	24"x24"x47"	Patented optimized primitive root reflection phase grating; omnidirectional, ideal for small rooms	$298-$398/box (2 per box)
Silent Source	SoundSucker	Corner bass traps	Class A/CC	12"x24", 12"x48"	Available in charcoal, beige, brown, blue, hunter green, burgundy; 8 and 4 units/box	$200
Silent Source	Whisper Wedge	Absorptive foam	Class A/C	24"x48"x2, 3, 4, 6" thick	Many colors to choose from, 2–12 sheets/box (16–96 sq ft); class 1 available	$160–$250/box
Sorber		Absorption baffle	N/A	48"x24", 44", or 66"	Free-standing; durable; lightweight	$35-$180
Soundsuckers	Acoustic Foam	Foam panels	Class 2	2'x4' to 4'x8'	Custom sizes, densities, thickness available	$20-$69
Soundsuckers	Premium Barrier Panels	Soundproofing panels	Fire retardant	2'x4'/ 4'x4'/4'x8'	High-density panel with 2" acoustic foam	$69/$138/$276
Soundsuckers	Standard Barrier Panels	Soundproofing panels	Fire retardant	2'x4'/ 4'x4'/4'x8'	High-density panel with 2" acoustic foam	$55/$110/$220
Systems Development Group	Cutting Wedge 2000	Absorptive foam	Available upon request	Various	Sawtooth pattern across face and back for easy stacking	$3/sq ft and up
Systems Development Group	Bass Eraser	Broadband bass trap	Class A	24"x48"x10"	Mounts horizontally or vertically	$360–$450
Systems Development Group	Cutting Wedge Classic	Absorptive foam	Fire/smoke analysis available	Various	Sawtooth pattern for greatest absorption per sq ft; tear resistant with shape memory	$3/sq ft and up
Systems Development Group	Model C	Diffusor	Full Class A	24"x24"x4.5"	Install on wall or drop into 24"x24" opening of a T-Bar grid; available with center cutout	$97-$166
Systems Development Group	Model E	Diffusor	Available	15"x15"x9"	Small footprint; light weight; simple install	$88
Systems Development Group	Model F	Acoustic diffusor	Full Class A	2"x24"x1.75"	Specialized high-frequency diffusion on wall or ceiling	$97-$166
Systems Development Group	Reflektors	Absorptive face/ reflective panel	N/A	24"x48"x8"	Creates relection-free listening space	$166
Systems Development Group	Sonora Panels	Absorptive fiberglass panel	Class A	Up to 48"x120"x2"	Molded fiberglass board non-resin chemically hardened edges, wrapped in Guillford fabrics	$8–$10/sq ft
Taytrix	Absorptive Panels	Absorptive panels	Class 1	2'x2', 2'x4', 2'x6'	Fiberglass absorption panels trimmed with decorator fabrics	$129 and up

PROFESSIONAL RECORDING EQUIPMENT

MANLEY Langevin

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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http://www.manleylabs.com

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SONIC TREATMENT

MANUFACTURER	MODEL	TYPE	FIRE RATING	DIMENSIONS	SPECIAL FEATURES	PRICE
Taytrix	Stack It Gobo System	Gobo	Class 1	15"x8"x48", 30"x8"x48"	Stackable, lightweight, modular, interlocking acoustical control panels	$300–$445
Vibrant Technologies	Diffuser Panel	Diffuser panel	Class A	23.75x23.75x6.25		$
Wave Forms CV-24	Diffusor	Diffusor panel	Class A	23.75"x23.75"x4.25"	Available in 48 colors	$69–$99
Wenger	Ceiling Diffusor	Acoustical panels	Class A	2'x2', 4'x4', 4'x2'	Convex shape; impact-resistant PVC/acrylic plastic	$90–$135
Wenger	Pyramidal Diffusor	Acoustical panels	Class A	2'x2', 4'x4'	Offset pyramid shape; impact-resistant PVC/acrylic plastic	$57–$156
Wenger	Quadratic Diffusor	Acoustical panels	Class A	4'x4'	Based on quadratic theory; effective over freq range of 750 Hz to 3.3 kH	$452
Wenger	Trapezoidal Diffusor	Acoustical panels	Class A	2'x2', 4'x4'	Offset trapezoid shape, fiberglass resin with white gel-coat finish	$101; $153
Wenger	V-Room Sound-Isolating Room	Modular studio with optional active LARES-based acoustics	N/A	From 5'8"x5'8" to 10'8"x13'2"	Provides acoustical simulations of 10 different environments	$9,000 and up
Wenger	Wall Diffusor	Acoustical panels	Class A	4'x4', 4'x8', other sizes available	Convex shape; PVC/acrylic plastic with reinforced corners and fabric covering	$276; $550
Whisper Room	SE Series	Sound-isolation enclosures	N/A	Various sizes available	Portable, modular; easy assem, cable passage; ventilation sys; door window	$1,995 and up

STUDIO FURNITURE

MANUFACTURER	PRODUCT	TYPE	DIMENSIONS (INCHES)	SPECIAL FEATURES	PRICE
Anthro	Console	Workstation for non-linear video editing, mixing, and post prod	72x23.5x37	Holds (3) 21" monitors, keyboard area adj for sitting/standing, shelves adj in 1" incr, lifetime warranty	$999
Anthro	RackCarts	Rack cart	13x17x21x29	Rack mounting on tapped mounting rails front/back, rack accessories avail	$719–$929
Anthro	AnthroBench	Studio furniture	48x60x72	Modular, open design, lifetime warranty, holds 600 lb	$999 and up
Argosy Console	90 Series Console Housing	Workstation for mixers	89.5x45x39	Expandable/modular enclosure with full padded armrest; for Mackie 8-bus, Digi ProControl and others	$1,529 and up
Argosy Console	70 Series for Digidesign Control 24	Specialized furnishings for Digidesign Control 24	68.2W x 42D x 40.1H	Houses Digidesign Control 24 and 12 rack spaces	$900 and up
Argosy Console	70 Series for Digidesign Procontrol	Specialized furnishings for Digidesign ProControl	68.2W x 44.5D x 37H	Houses up to 24 channels of ProControl; 10 rack spaces available	$800 and up
Argosy Console	70 Series for Mackie 8-bus	Specialized furnishings for Mackie 8-bus	68.2W x 44.5D x 37H	Houses Mackie 8-bus and 11 rack spaces	$800 and up
Argosy Console	70 Series for Mackie Digital 8-bus	Specialized furnishings for Mackie digital 8-bus	68.2W x 42D x 37H	Houses Mackie digial 8-bus with optional 8 rack spaces or 21" monitor insert	$900 and up
Argosy Console	70 Series for Sony DMX-R100	Specialized furnishings for Sony DMX-R100	68.2W x 42D x 38H	Houses Sony DMX-R100 and 9 rack spaces	$1,150 and up
Argosy Console	70 Series for Yamaha O2R	Specialized furnishings for Yamah O2R	68.2W x 44.5D x 40.1H	Houses Yamaha O2R and 13 rack spaces	$880 and up
Argosy Console	90 Series for Digidesign Control 24	Specialized furnishings for Digidesign Control 24	Starts at 89.5 wide, expandable to fit your needs	Houses Control 24, monitor, and rack gear, multiple configurations available	$1,780 and up
Argosy Console	90 Series for Digidesign ProControl	Specialized furnishings for Digidesign ProControl	Starts at 89.5 wide, expandable to fit your needs	Houses Procontrol and rack gear, multiple configurations available	$1,500 and up

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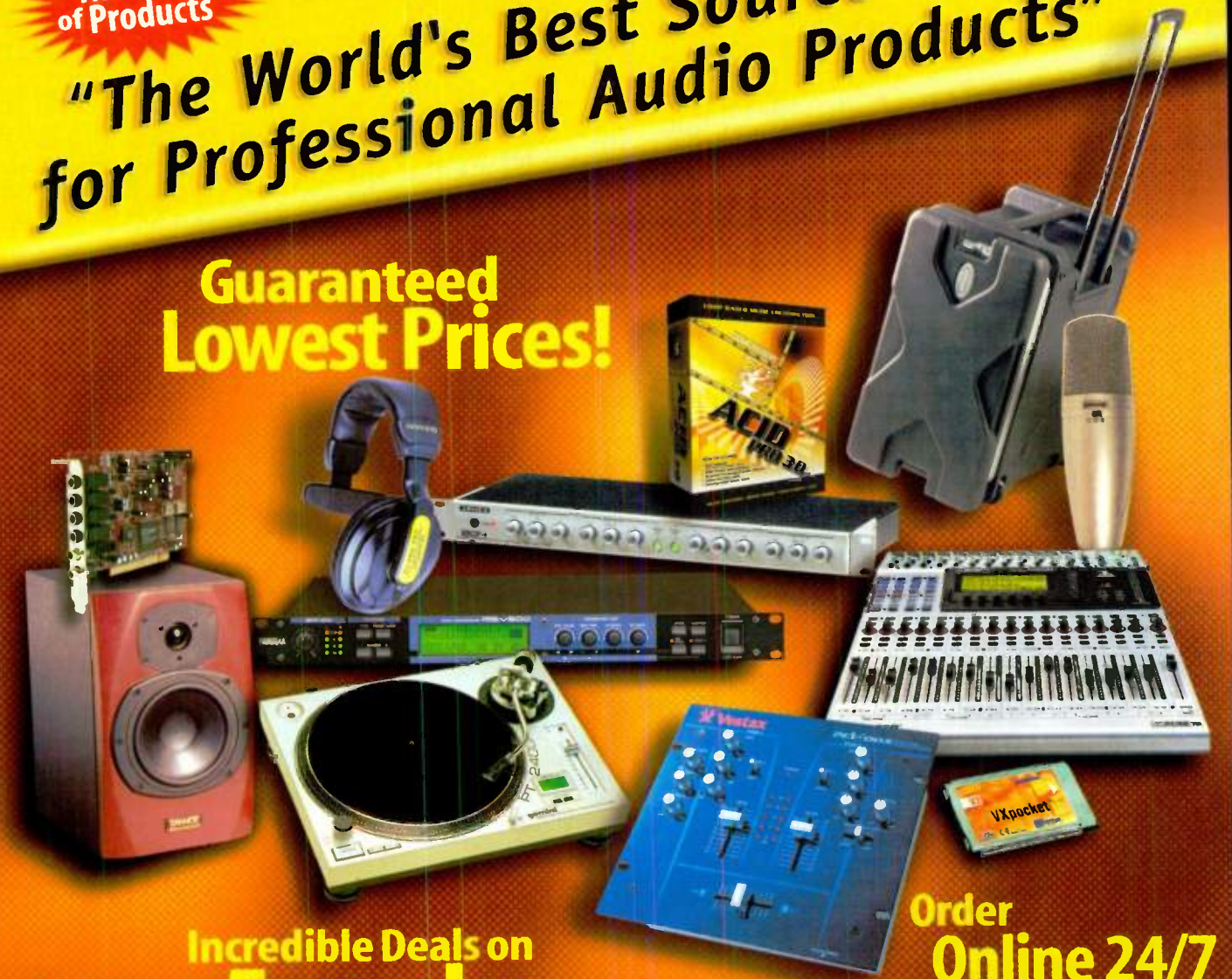

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MANUFACTURER	PRODUCT	TYPE	DIMENSIONS (INCHES)	SPECIAL FEATURES	PRICE
Argosy Console	90 Series for Sony DMX-R100	Specialized furnishings for Sony DMX-R100	Starts at 89.5 wide, expandable to fit your needs	Houses Sony DMX-R100, monitors and rack gear; multiple configurations available	$1,950 and up
Argosy Console	90 Series Studio Furnishings	Specialized enclosures for popular mixers	Starts at 89.5 wide, expandable to fit your needs	Expandable enclusre w/full padded armrest, removable back panel; modular design, heavy gauge steel legs, casters and mahogany end panel available	$1,476 and up
Argosy Console	90 Series for Yamaha O2R	Specialized furnishings for Yamaha O2R	Starts at 89.5 wide, expandable to fit your needs	Houses Yamaha O2R, monitors and rack gear, multiple configurations available	$1,614 and up
Argosy Console	90 V Series	Enclosure for video editing systems	Starts at 89.5 wide, expandable to fit your needs	Expandable enclosure w/full padded armrest, mix and match monitor inserts, rack units to suit, casters and mahogany end panels available	$1,100 and up
Argosy Console	Dual 15	Workstation for computer-based systems	94W x 50D x 43H	Holds two 21" computer monitors, houses 38 spaces, alternative rack modules available; mahogany end panels and casters available	$1,200 and up
Argosy Console	Dual 15	Workstation for digital-based rec/mix/post computer systems	90x50x43	Holds two 21" computer monitors plus 38 rack spaces; space for controllers and computer keyboard; full length padded armrest	$1,200
Argosy Console	Dual 15-K	Workstation for keyboard-based systems	94W x 50D x 43H	Holds two 21" monitors and up to 57" full size keyboard, houses 38 rack spaces, alternative rack modules available, mahogany end panels and casters available	$1,220 and up
Argosy Console	Dual 15K	Workstation for keyboard-based systems	94x50x43	Holds two 21" computer monitors plus 38 rack spaces; up to a 57" full size keyboard	$2,000 and up
Argosy Console	Dual 15M-3	Workstation for mastering facilities	94x50x29.25	Full length padded armrest, 24 rack spaces; customizable	$1,400
Argosy Console	Nevis 70 Series Console Housing	Workstation	68x45x30	Full padded armrest; multi-access bridge lids, optional oak end panels; casters available	$700 and up
Argosy Console	Nevis 70 Series Studio Furnishings	Specialized enclosures for popular mixers	68.2W x 45 x 30	Full padded armrest; multi-access bridge lids, steel legs; oak end panels and casters available	$800 and up
Argosy Console	Nevis 70V Series	Enclosure for video editing systems	68.2x42.7x33.75	Full padded armrest, mix & match rack units & monitor inserts to suit	$690 and up
Argosy Console	Spire Rack Enclosures	Single, double, triple and quad rack bays, 14 or 28 spaces high	22–82x33x24	Optional finishes; producers desk attachments; removable access doors; optional shelves; casters available	$300 and up
Argosy Console	Spire Speaker Stands	42" speaker stand	Base: 16x16; top: 12x12	Optional finishes	$55-$140
Argosy Console	Spire V Series Rack Enclosures	Rack bays	22.6-82.25x41.5-86.5x30	Optional finishes, removable access doors; optional front doors available	$890 and up
Boutique Audio	Rack	Racks for vintage modules	5.25x19x14	Steel enclosure, internal shielded power supplies; 1/4" instrument input on front panel; XLRs on rear panel	$995
Bryco Products	CD60, CDB60	Solid oak CD racks	21.63x11.25x4.88	Table or wall mount; holds 60 CDs	$55
Bryco Products	CDP-60	Thick plastic CD rack	15.75x13.88x4.25	Wall or table mount; holds 60 CDs	$25
Bryco Products	CP-48	Cassette tape storage racks	18.5x11.5x2	Wall or table mount; holds 48 cassettes	$22
Bryco Products	DLT-18	DLT storage rack	14x8.5x2.5	Holds 18 DLT tapes	$20
Bryco Products	DR-60 DATRAX, DRB-60 DATRAX	DAT tape holder— solid oak (natural or black)	21.25x9.5x2	Wall or table mount; holds 60 DATs	$55
Bryco Products	DRP-40	DAT tape holder	17.38x7.38x2	Wall or table mount; holds 40 DATs	$22
Bryco Products	DSD-320/DSD 320L	DAT tape storage cabinet	19.5x21.75x15.5	Stores 320 DATs	$349/$399
Bryco Products	MD-80	Minidisc holder	17.38x7.38x2	Wall or table mount; holds 80 Minidiscs	$22
Bryco Products	MDV-24	Mini DV tape rack	9.5x7.38x1.75	Wall or table mount; holds 24 mini DV tapes	$15
Bryco Products	MDV-50	Mini DV tape rack	15.88x8.88x1.75	Holds 50 tapes; wall or table mount	$22
Bryco Products	PDVL-18	DV tape storage rack	17x6.25x2.38	Holds 18 tapes; wall or table mount	$20
Bryco Products	V8-36 & V8-36 Pro	8 mm tape storage racks	Reg: 17.5x10.25x2.38 Pro: 18.25x9.63x2.19	Wall or table mount; holds 36 tapes	$22
HSA	Oak Rolltop Desks and Racks	Oak rolltop desks and racks	Variable	Locking tambour doors, cover racks, and worksurface	$1,995 and up
Littlite	Task Lamp	Task lamp	6, 12, or 18 goosenecks	Flexible task lamp avail in 5W or 2.5W	$25–$160
Middle Atlantic	MultiDesk Video Modular Furniture System	Recording/mixing workstation	Custom	Choice of four desks, side racks, and connecting wedge	$488-$840
Middle Atlantic	OBRK Series Racks	Oak laminate rack	Various heights, 18" deep	Deep; concealed fasteners	$169-$238
Middle Atlantic	RK/BRK Series Racks	Black laminate rack	Various heights, 18" deep	Deep; concealed fasteners	$108-$184
Omnirax	C2	Keyboard composing/audio-video workstation	45.75x43.4x107.25	Holds keyboard, two comp monitors, near-field monitors, comp keyboard; 58 rack spaces	$2,120
Omnirax	CHKSC24	Optional solid mahogany cheeks for the S6C24	16.5x42.7x1.1	Enhances the look and feel of the Synergy console	$400
Omnirax	Cheeks-Synergy	Solid mahogany	17.9x41.7x1.25		$400
Omnirax	CHKSR100	Optional solid mahogany cheeks for the S8R100 console	15.9x41.6x1.1	Enhances the look and feel of the Synergy console	$400

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STUDIO FURNITURE

MANUFACTURER	PRODUCT	TYPE	DIMENSIONS (INCHES)	SPECIAL FEATURES	PRICE
Omnirax	Coda	Digital editing/mixing workstation	38.75x38.5x67.9	For computer and peripherals; fits Mackie HUI and other compact mixers/controllers	$990
Omnirax	Coda 328	Mixing workstation for Spirit 328	38.75x46.25x42.25	Ergonomic environment for Spirit 328, computer, and peripherals	$990
Omnirax	Coda 2328	Mixing workstation for 2 Spirit 328s	38.75 46.25x70.4	Ergonomic multi-level; 42 rack spaces	$1,190
Omnirax	Coda D8	Mixing workstation	38.5x36.6x71.38	Workstation for Mackie Designs Digital 8-bus mixer and peripherals	$1,060
Omnirax	Coda EX	Mixing workstation	38.14x40.38x71.38	For digital mix/edit environments; 18 rack spaces	$1,130
Omnirax	Commander	Keyboard, composing, and mixing workstation	48x44.5x88	Holds up to 88-note keyboards with room for computer and near-field monitors; 60 rack spaces	$1,720
Omnirax	CW-22	22 rack-space rolling console	50.25x24 x20.6	22 rack spaces: 8 vertical below, 14 slanted above	$330
Omnirax	CW-30	30 rack-space rolling console	36.5x36.5x20.6	14 rack spaces on sloping top, 10 rack spaces below, 6 lower rear	$430
Omnirax	E-146	Slanted rolling rack	30.63x26x20.6	Slanted rolling rack; 14 spaces front, 6 spaces lower rear	$250
Omnirax	E-Series	Studio racks	8.75–19.25x12x20.6	4, 6, and 10-space racks 12" overall depth	$100–$250
Omnirax	Fido	CPU cart	14.5x16x10	Rolling cart for any CPU up to 10" wide	$140
Omnirax	Force 12	Multi-purpose mixing/composing/ audio video workstation	36x52.9x86	12 rack spaces above desk; expansive video/near field monitor bridge	$1,590
Omnirax	Force 12 MF Mahogany Finish	Multi-purpose mixing/composing/ audio video workstation	36x52.9x86	12 rack spaces above spacious desk; expansive video/near field monitor bridge	$1,890
Omnirax	Force 24	Multi-purpose mixing/composing/ audio video workstation	39.7x39x94	24 rack spaces below spacious desk; expansive video/near field monitor bridge	$1,590
Omnirax	Force 24 MF Mahogany Finish	Multi-purpose mixing/composing/ audio video workstation	39.7x39x94	24 rack spaces below spacious desk; expansive video/near field monitor bridge	$1,890
Omnirax	Forte	Keyboard/nearfields/computer workstation	42x54.25x101.25	Holds keyboards up to 59" wide; 64 rack spaces	$2,600
Omnirax	Fusion	Keyboard composing workstation and riser bridge	38.6x53.9x93.8	Holds 88-note keyboard with 3 rack bays	$1,650
Omnirax	FUSTB	Hardwood tambour back for fusion	36x1x58.8	Covers all cable runs	$450
Omnirax	Hush Box	13-space quiet cabinet with exhaust fan	29.4x27.8x25.6	Curved glass door front, lined with acoustical foam; rear door, integrated fan	$1,500
Omnirax	KMS	Computer keyboard and mouse shelf; access for OmniDesk	0.75x9.2x28.5	Computer keyboard/mouse shelf	$90-$170
Omnirax	KMSD8	Computer keyboard/mouse shelf	0.75x10.25x38.5	Fully articulating mechanism fits MixStation D8	$170
Omnirax	KMSF	Computer keyboard/mouse shelf	0.75x8x28.5	Fully articulating mechanism fits Fusion	$170
Omnirax	KSHLF	Computer keyboard shelf	7.75x8x19	Stand positions computer keyboard	$90
Omnirax	M8	Compact mixing workstation	45.5x36x40.5	Fits Mackie 24.8 mixer and others; 8 total rack spaces	$590
Omnirax	MiniStation	Compact keyboard/ computer workstation	39.75x30x48	Holds keyboards up to 46.5"wide; space for computer, keyboard/writing shelf; 6 rack spaces	$880
Omnirax	MixStation 2O2R	Mixing workstation for 2 Yamaha 02Rs	43.4x39x97.25	Ergonomic multi-level for 2 Yamaha 02R; 42 rack spaces	$1,720
Omnirax	MixStation D8	Mixing workstation for Mackie d8b	43.4x39x83.25	Ergonomic multi-level for Mackie d8b; 42 rack spaces	$1,590
Omnirax	MixStation DA7	Mixing workstation for Panasonic DA7	43.4x39x71.87	Ergonomic multi-level for Panasonic DA7; 42 rack spaces	$1,590
Omnirax	MixStation MAK24	Console workstation for Mackie 24/8 bus mixer	43x37.9x81.6	Multilevel unit for Mackie 24.8 mixer, computer, and peripherals; 42 rack spaces	$1,590
Omnirax	MixStation MAK32	Console workstation for Mackie 32/8 bus mixer	43x37.9x90.5	Multilevel unit for Mackie 32.8 mixer, computer, and peripherals; 42 rack spaces	$1,650
Omnirax	MixStation O2R	Console workstation for Yamaha O2R	43.4x39x70.75	Multilevel unit for Yamaha O2R mixer, computer, and peripherals; 42 rack spaces	$1,590
Omnirax	Mobi	Mobile computer workstation	55.1x28.75x20.6	Room for 14" monitor, CPU, and computer keyboard; 10 rack spaces	$530
Omnirax	OM13	13-space cabinet	29.4x24x31.6	For OmniDesk; right- or lefthanded versions; 13 rack spaces	$330
Omnirax	OM13D	13-space cabinet with CPU cubby	29.4x24x42.3	For to OmniDesk; right- or lefthanded versions; solid door; 10" CPU cubby; 13 spaces	$550
Omnirax	OmniDesk	Audio/Video workstation desk	35.5x34.6x77.6	Curved work surface and monitor bridge; 29 rack spaces	$1,150
Omnirax	Presto	Computer/nearfields desk	37.13x31.38x55.88	Optional KMS-PR	$500
Omnirax	Pro-20	Rolling studio rack	44.5x18x20.6	Slant front; 20-sapce rolling rack	$250
Omnirax	Pro-316	3-bay producer's studio rack	34.56x27.6x62	Rolling rack; 48 rack spaces in 3 slanted bays of 16 spaces; large top surf area	$790
Omnirax	Producer's Corner	5-piece audio/video suite	36.1x3x120.6	Workstation suite for audio/video editing; enclosed CPU space holds multiple video monitors and near fields; 28 rack spaces	$1,760
Omnirax	ProStation	Digital audio workstation	44x36x72.25	For computer and near-field monitors; 30 rack spaces	$1,390

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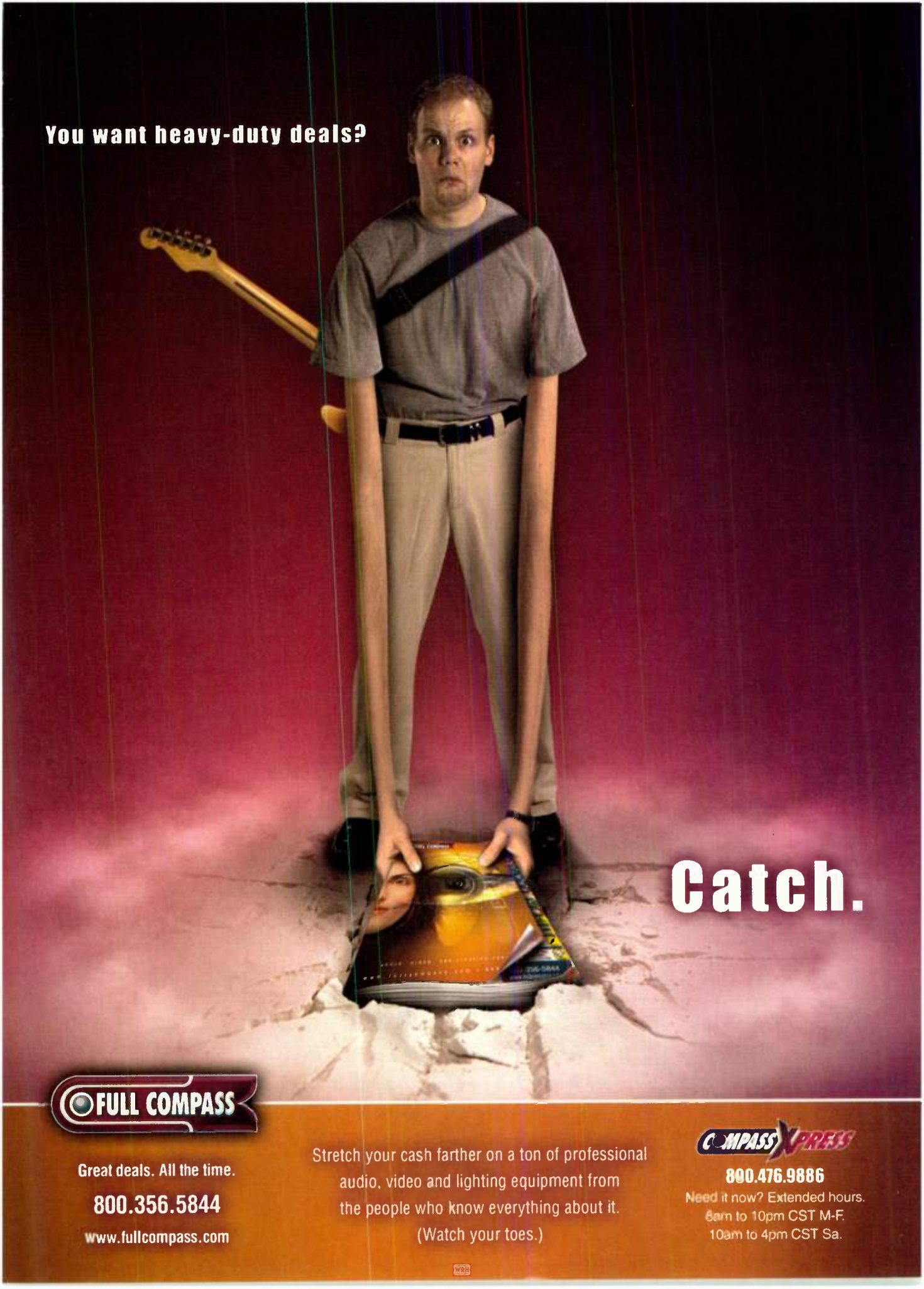
MANUFACTURER	PRODUCT	TYPE	DIMENSIONS (INCHES)	SPECIAL FEATURES	PRICE
Omnirax	ProStation Junior	Digital audio workstation	42.5x29.5x60.4	For computer and near-field monitors; 14 rack spaces	$990
Omnirax	ProStation Junior M/C	Keyboard, composing workstation	43x29.5x60.4	Compact workstation for keyboard composing; holds computer and near-field monitors; 12 rack spaces	$950
Omnirax	ProStation M/C	Keyboard composing/ mixing workstation	45.5x36x72.25	For mixing boards or keyboard composing; holds computer and near-field monitors; 26 rack spaces	$1,350
Omnirax	S1000 2 D8	Console housing for 2 Mackie d8b	41.37x41.7x121.5	Fits Mackie d8bs; contoured padded wrist rest; two 12-space rack bays	$2,500
Omnirax	S6C24	Console workstation for the Digidesign Control 24	40x42.7x87.5	Dedicated Synergy console for Digidesign's Procontrol 24; 24 rack spaces	$1,500
Omnirax	S8R100	Console workstation for Sony DMX R100	38.2x41.6x91.1	Padded wrist with lift out section for access to drive; 20 spaces	$1,990
Omnirax	Sidecars D8/EX	Sidecar	38.5x39.38x36	Sidecars attach directly to the Coda D8 or EX; left or right-handed;17 rack spaces each	$530
Omnirax	Sidekick	Rolling workstation	44.37x24.9x20.6	13 rack spaces; space for controllers and peripherals	$430
Omnirax	Synthrax 88	Multiple keyboard housing and 30 rack spaces	48.9x24x60.4	Holds three 88-note synths on sliding, locking shelves; 30 rack spaces	$1,090
Omnirax	Synergy Jr	Console workstation for the Sony VM C-7200 and other small mixers	39.5x39.6x70.8	Adaptable console; housing for smaller format mixers; padded wrist rest; mixer specific kits available; 18 spaces	$1,450
Omnirax	Synergy 600	Mixing console housing	41.1x41.7x83.5	Adaptable console housing for most mixers; padded wrist rest; 12-space rack bay	$1,300 and up
Omnirax	Synergy 600 D8	Console housing for Mackie d8b	41.1x41.7x83.5	Fits Mackie d8b; contoured padded wrist rest; two 12-space rack bays	$1,590
Omnirax	Synergy 800	Mixing console housing	41.37x41.7 x101.1	Adaptable console housing for most mixers; padded wrist rest; 12-space rack bay	$1,720 and up
Omnirax	Synergy 800 2D8	Console housing for 2 Mackie d8b	41.37x41.7x101.1	Fits 2 Mackie d8b; contoured padded wrist rest; one 12-space rack bay	$2,100
Omnirax	Synergy 800 D8	Console housing for Mackie d8b	41.37x41.7x101.1	Fits Mackie d8b; contoured padded wrist rest; two 12-space rack bays	$2,100
Omnirax	Synergy 1000	Mixing console housing	41.37x41.7x121.5	Adaptable console housing for most mixers; padded wrist rest; 12-space rack bay; many mixer-specific kits available	$2,120 and up
Omnirax	Synergy 1000 D8	Console housing for Mackie d8b	41.37x41.7x121.5	Fits Mackie d8b; contoured padded wrist rest; two 12-space rack bays	$2,500
Omnirax	Synergy Kits	Add-on kits for Synergy series console housings	Varies according to mixer	Additional rack bays, writing surfaces and filler panels for 600, 800, 1,000	$110–$370
Omnirax	Synthrax 76	Three-tier synthesizer station	48.9x24x54.75	3 sliding, locking shelves for 76-note and smaller keyboards; 20 rack spaces below	$990
Omnirax	SX-C24	Computer/nearfields desk	40x42.7x23.75		$790
Omnirax	Tyro	Ultra-compact keyboard/ computer workstation	34x23.75x45.25	For keyboards up to 43" wide, piano shelf slides out/locks in place; computer kybord slides out/locks in place; 12 rack spaces	$830
Per Madsen Design	RACKIT System 19 Base 19	Foundation for System 19 units	20.75x16x1.5	Provides a foundation for stacking System 19 units	$40
Per Madsen Design	RACKIT System 19 Cassette 19	Media storage drawers (3 drawers)	15x20.75x16	Modular, stackable oak or birch drawer units hold DAT, 8 mm, minidiscs, floppy discs	$275–$295
Per Madsen Design	RACKIT System 19 Cassette 19-10	Media storage cabinet	20.75x16x10	Stores audio, video, and DAT tapes; two drawers	$225 (birch)/ $245 (oak)
Per Madsen Design	RACKIT System 19 CD 19 unit	Media storage drawers	15x20.75x16	Modular, stackable oak or birch drawer units hold CD, Minidisc, and zip VHS	$245–$265
Per Madsen Design	RACKIT System 19 Component Rack	Equipment rack with shelves	5,7.5,10,15x20.75x16	Modular, stackable oak equipment racks	$90/$95/ $105/$110
Per Madsen Design	RACKIT System 19 Component Rack Rails	Equipment racks with mounting rails	10,15,30x20.75x16 EIA standard 5, 8, and 16 unit sizes	Modular, stackable oak equipment racks	$110/$125/$185
Per Madsen Design	RACKIT System 19 Disc Cabinet 19	Media storage cabinet glass door	15x20.75x16	Stores LPs, laser discs, books	$185
Per Madsen Design	RACKIT System 19 Disc Cabinet 19	Media storage cabinet open front	15x20.75x16	Stores LPs, laser discs, books	$135
Per Madsen Design	RACKIT System 19 DVD/VHS 19 unit	Media storage drawers	15x20.75x16	Modular, stackable oak or birch drawer units hold DVD, and zip VHS	$245–$265
Per Madsen Design	RACKIT System 19 Dolly 19	Dolly for all RACKIT System 19 units	4x20.75x16	4 twin-wheel casters; 300 pounds rolling load	$55
Per Madsen Design	RACKIT System 19 Dolly 19 PC Tower	Dolly for RACKIT System 19 units	4x30x16	Holds RACKIT 19 units and PC tower	$110
Per Madsen Design	RACKIT System 19 File 19-25	Storage drawers for hanging files (2 drawers)	25x20.75x16	Stores letter or legal hanging file folders	$330–$365



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STUDIO FURNITURE

MANUFACTURER	PRODUCT	TYPE	DIMENSIONS (INCHES)	SPECIAL FEATURES	PRICE
Per Madsen Design	RACKIT System 19 File 19-25	Storage drawers for hanging files (3 drawers)	25x20.75x16	Stores letter or legal hanging folders, cassettes, DATs and CDs	$360–$395
Per Madsen Design	RACKIT System 19 Tabletop 19	Tabletop for any System 19 unit	20.75x16x0.75	Provides a solid wood surface for System 19 units	$40
Quik-Lok	A-50	Tripod studio boom stand	Height: 53.5–91.5; Boom : 46.5–87	Tripod leg design with solid steel legs; holds mics, locking casters, 7' boom, mic cable clips	$180
Quik-Lok	BS-300	Height adjustable near field	Shelf: 9 square; height: 31.5–48; base 17.7 each side	All-steel, arc-welded construction, cable management, triangle base with adj leveling floor spikes	$180/pair
Quik-Lok	BS-336	36" fixedheight near field studio monitor stand	Shelf: 11 square; height 36; base 17.7	All-steel, arc-welded construction, cable management; triangle base with adj leveling floor spikes	$150/pair
Quik-Lok	BS-342	42" fixed-height near field studio monitor stand	Shelf: 11 square; height 42; base 17.7"	All-steel, arc-welded construction, cable management, triangle base with adj leveling floor spikes	$160
Quik-Lok	Z-250	Triple-shelf computer workstation	33.6x29.8x22.3	Main shelf with pull-out and peripheral shelves; holds computer equip/access	$320
Quik-Lok	Z-544	Z-500 Series expandable music project station (44"w)	64.6x40.1x27.5	Expandable, holds computer peripherals, spkrs, rack equip, keyboards, mixers, shelves and crossbars	$280
Quik-Lok	Z-555	Z-500 Series expandable music project station (55"w)	55–75.6x28.75x35.4	Expandable; shelves and crossbars, computer-welded steel frame	$300
Quik-Lok	Z-750L	Computer workstation	52.8x28.9x22.3	Large left-angled main shelf with pull-out and peripheral shelves; scratch-resistant 3/4" laminate shelves	$350
Quik-Lok	Z-750R	Computer workstation	28.9x52.8x22.2	Main shelf with pull-out and peripheral shelves	$350
Rackcraft	Desktop Studio Rack	Black laminated melamine board with T-mold edging	25.5x2x48.16	Desktop, 20 rack spaces; ideal for Mackie ADAT studio with effects and monitors	$299
SoundAnchors	ADMID	Adjustable studio monitor stand	Custom	Adjustable platform heights; variable speaker tilt	$425
SoundAnchors	Digital Audio Workstation	Workstation for digital-based recording, mixing, post-production	Custom	Adjustable platform heights; built-in cable management, can be configured for multiple monitors	$450 and up
SoundAnchors	Mixer Table	Custom mixing table	Custom	Adjustable platform heights, can be configured for multiple monitors	$750 and up
SoundAnchors	PROJ	Studio monitor stand	Custom	Spikes at floor, sorbathane pads	$235
SoundAnchors	PROVID	Adjustable studio video monitor stand	Custom	Adjustable platform heights, spikes at floor, variable tilt platform	$275 and up
SoundAnchors	STUDADJ	Adjustable studio monitor stand	Custom	Adjustable platform heights, prefilled and damped, variable speaker tilt	$335
SoundAnchors	STUDADJR	Adjustable studio monitor stand	Custom	Adjustable platform heights, prefilled and damped, variable speaker tilt, heavy duty platforms	$375
Soundsuckers	Sound Isolation Booth	Iso booth	4'x4'x7' 2" to 8'x8'x7' 2"	Compression door sealing, cam door closure, optional low-profile ventilation ($355), easy assembly	$1,999-$6,835
Standtastic	100KS Single Tier Keyboard Stand Frame	Keyboard stand	48 tall, variable width; folds to 6x48	Fully adjustable	$149
Standtastic	100TK Tier kits	Accessory for stands and wall mount kits	12–24 depth; 3 angle adjustments	Fully adjustable	$68/pair
Standtastic	102KS 2 Tier Keyboard Stand 60° Frame	2-tier keyboard stand	60 tall; adjustable width, holds 2 keyboards	Fully adjustable; folds to compact size	$209
Standtastic	103KS 3 Tier Keyboard Stand 60° Frame	3-tier keyboard stand	60 tall frame; adjustable width	Fully adjustable	$259
Standtastic	122KS Double Tier Keyboard Stand Frame	For live or studio performance	48 tall; variable width, folds to 6x48		$199
Standtastic	P3 Wood Adjustable Stand	Home or studio	36–54 width adjustment	Adjustable width	$200
Standtastic	UB-1 U Bolts	Wall-mount kit accessory	N/A	Adjusts 100TK's to 90° when used with VF-1s on the wall	$10
Standtastic	VF-1 Vertical Frames	Wall-mount kit accessory	36 tall	Attaches to wall so 100TKs can be attached for wall mounting keyboards	$53/pair
Taytrix	Counter tops	Counter tops	Varies	Straight, angle wing, corner units	$35/sq ft and up
Taytrix	Rack Units	12, 14 and 16 rackspace units	29.5–32x16.5–23	Available in square or unique front-angle design, maple or cherry furniture-grade plywood	$117–$300
Taytrix	Workstations	Workstation	6.5' and 5' mini ovals	Adjustable meter bridge shelf, 180° swivel speaker wings, rack packages available	$2,875 and up
Ultimate Support	HS26BP	Studio organizer stand	Height adjustable from 27.5–32 surface: 16x35.5	Large work surface, center tier and side arms support gear; many accessories available	$250
Ultimate Support	MS36	Studio monitor stand	Height: 36, top plate 9x9, triangle base diameter: 14	Cable mangement, triangle cast zinc base, available in black and pewter	$210/pair
Ultimate Support	MS45	Studio monitor stand	Height: 45, top plate 9x9, triangle base diameter: 14	Cable mangement, triangle cast zinc base, available in black and pewter	$230/pair
Wenger	Workstation	Computer/synthesizer workstation	48x37x32	Cockpit-like design, steel and wood frame, cord-mangement system	$1,143

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EQ - June 2001

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Electronic Musician - February 2002

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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
Access	Virus B	24/16	N/A	24/12 dB LP, BP, HP, BS	512	128	Yes	N/N/N	No	N/A	0
Alesis	DM5 Drum Module	16/1	4 MB	LP/No	0/20	0/0	No	Y/N/N	No	N/A	12 trigger
Alesis	DM Pro	64/16	16/8 MB with flash cards	LP/No	1,536/128	0/64	Yes	Y/N/N	No	N/A	Pedal, 16 trigger 1/4" inputs
Analogue Solutions	Vostok Suitcase	1/1	256/0	LP, HP, BP/Yes	N/A	N/A	Y	N/N/N	No	N/A	Joystick
Doepfer	A-100 Modular Synthesizer	Depends on configuration	N/A	6	0	None	With port module	Optional	No	N/A	0
Edirol	SC-8820 Sound Canvas	64/32	64 MB	Yes	1,608	N/A	Yes	Y/Y/N	Yes/serial; USB	N/A	0
Edirol	SC-8850 Sound Canvas	128/64	64 MB	Yes	1,640	N/A	Yes	Y/Y/N	Yes/serial; USB	N/A	0
Edirol	Studio Canvas SD-20	64/32	N/A	LP	660/23 Drums sets	N/A	Yes	Y/Y/Y	USB, serial	N/A	0
Edirol	SC-D70	64/32	64 MB	LP/Yes	1,608	0	Yes	Y/Y/N	Yes/USB	N/A	0
Edirol	Studio Canvas SD-80	128/32	N/A	LP	1,050/30 Drums sets	N/A	Yes	Y/Y/Y	USB	N/A	0
Edirol	Studio Canvas SD-90	128/32	N/A	LP	1,050/30 Drums sets	N/A	Yes	Y/Y/Y	USB	N/A	0
Edirol	Studio Canvas SK-500	64/32	N/A	LP	1,608/63 Drums sets	N/A	Yes	Y/Y/N	USB, serial	N/A	0
E-mu Systems	B-3	64/16	32 MB (exp to 64)/0	17/Yes	384/512	64	Yes	N/N/N	No	N/A	0
E-mu Systems	E5000 Ultra	64/16 (exp to 32)	0 MB (exp to 64)/ 4 (exp to 128)	21/Yes	1,000/1,000	1	Yes	N/N/N	Yes/SCSI	N/A	0
E-mu Systems	E5000 Ultra Turbo	64/16 (exp to 32)	32 MB (exp to 64)/ 64 (exp to 128)	21/Yes	1,000/1,000	1	Yes	N/N/N	Yes/SCSI	IDE	0
E-mu Systems	E6400 Ultra	64 (exp to 128)/ 16 (exp to 32)	0 MB (exp to 64)/ 16 (exp to 128)	21/Yes	1,000/1,000	1	Yes	N/N/N	Yes/SCSI	N/A	0
E-mu Systems	Mo'Phatt	64 (exp to 128)/ 16 (exp to 32)	32 MB (exp to 64)/0	12th order/Yes	512/512	64	Yes	N/N/N	No	N/A	0
E-mu Systems	Orbit 3	128/32	64 (exp to 128)/0	Over 50/Yes	1024 factory/ 512 user	64	Yes	N/N/N	No	N/A	N/A
E-mu Systems	Planet Earth	64/16 (exp to 128)	32 MB (ex to 64/128)	50/Yes	512/512	64	Yes	N/N/N	No	N/A	0
E-mu Systems	Proteus 1000	64/16	32 (exp to 64)	Over 50/Yes	1024 factory/ 512 user	64	Yes	N/N/N	No	N/A	N/A
E-mu Systems	Proteus 2000	128/32	32 MB (exp to 128)	17/Yes	1024/512	64	Yes	N/N/N	No	N/A	0
E-mu Systems	Proteus 2500	128/32	32 (exp to 128)/0	50+/Yes	512 factory/ 512 user	64	Yes	N/N/N	Yes/USB	N/A	(2) footswitch
E-mu Systems	Turbo Phatt	128/32	32 (exp to 128)	50/Yes	512/512	64	Yes	N/N/N	No	N/A	0
E-mu Systems	Virtuoso 2000	128/32	64 MB (exp to 128)/0	17/Yes	512/512	64	Yes	N/N/N	No	N/A	0
E-mu Systems	XL-1 Turbo	128/32	32 (exp to 128)	50/Yes	512/512	64	Yes	N/N/N	No	N/A	0
E-mu Systems	Xtreme Lead-1	64/16	32 MB (exp to 64)/0	12th order/Yes	512/512	64	Yes	N/N/N	No	N/A	0
Ensoniq	ASR-X Pro	32/16	2/2 MB (exp to 66)	LP, HP, BP/Yes	0/0	1	Yes	N/N/N	Yes/SCSI	N/A	0
Future Retro	FR-777	1	0	LP, HP/Yes	0	NA	Yes	N/N/N	No	N/A	0
Korg	EA-1	2/2	N/A	LP/Yes	0/448	0/256	Yes	N/N/N	No	N/A	0
Korg	ES-1	10/0	N/A	LP	0/100	N/A	No	N/N/N	No	SmartMedia	0
Korg	MS2000R	4/1	DWGS in ROM	LP, BP, HP	0/128	N/A	Yes	N/N/N	No	N/A	(2) assignable pedal and switches
Korg	Triton Rack	62/16	32 MB in ROM/ up to 128 in RAM	HP, LP	0/640	0/512	Yes	N/N/N	No	3.5" HD/DD	0
Kurzweil	K2600R/K2600RS	48/16	8 MB ROM (exp to 128)	LP, HP, BP, notch, AP/Yes	200/1,000	100/1,000	Yes	Y/N/N	Yes/SCSI	Floppy	0
Kurzweil	Micro Ensemble	32/16	16/0	LP, HP, BP, notch	256/0	0/0	Yes	N/N/N	No	N/A	0
Kurzweil	Micropiano	32/0	6/0	N/A	32/0	0/0	No	N/N/N	No	N/A	0
Kurzweil	PC2R	64/16	16/0	LP, HP, BP, notch	272/128	32/128	Yes	Y/N/N	No	N/A	4 knobs
MAM	ADX 1 Analog Drum	5/5	N/A	LP/Yes	0/0	N/A	No	N/N/N	No	N/A	N/A
MAM	MB33 II Analog Bass	1/1	N/A	VCF 18 dB LP/Yes	1	N/A	No	N/N/N	No	N/A	VCF

# OF SEQUENCER TRACKS / PPQN	SEQUENCER MEMORY	TYPES OF QUANTIZATION	ARPEGGIATOR	# OF EFFECTS PROCESSORS / EFFECTS	# OF AUDIO OUTPUTS / TYPE	SPECIAL FEATURES	OPTIONS	PRICE
N/A	N/A	N/A	Yes	1/32	(6) mono; (3) stereo	Stereo filter inputs; 3 LFOs, 2 env; sine, triangle, saw, pulse, plus 64 waveshape	Virus KB (keyboard version)	$1,795
N/A	N/A	N/A	No	N/A	(4) 1/4"			$449
16/480	8 MB/50 seq on PCMCIA card	N/A	No	1/5	(6) 1/4" TRS	16 trigger ins; 2 RCA ins		$899
1/4	8	9ths	No	8	N/A	Full patchable discrete component analog modular synth; pin matrix board patch panel; portable modular in suitcase		$2,595
N/A	N/A	With quantize module	No	Depends on configuration	Depends on configuration	100% analog modular synth system; 50 different modules available		$50 and up
N/A	N/A	N/A	No	1/64	(2) RCA	Hybrid CD-ROM; GSAE sound editing software; power supplied by USB bus		$549
N/A	N/A	N/A	No	1/64	(4) RCA	Includes hybrid CD with GSAE editing software		$1,195
N/A	N/A	N/A	Yes	1/2	1/8" line I/O; headphone; S/PDIF (optical)	24-bit, 44.1kHz and 48 kHz Sampling Rates; USB powered		$375
N/A	N/A	N/A	No	1/64	(6) RCA	24-bit USB audio/MIDI interface		$798
N/A	N/A	N/A	Yes	3/3	1/4" line I/O; headphone; S/PDIF (coax, optical)	24-bit, 44.1kHz and 48 kHz Sampling Rates		$899
N/A	N/A	N/A	Yes	3/90	RCA line I/O; headphone; S/PDIF (coax, optical)	Audio Capture: 2-channel, 24-bit A/D/A, 44.1 and 48 kHz Sample Rates; (2) MIDI I/O		$1,125
N/A	N/A	N/A	Yes	1/5	(2) headphone; line I/O			$649
N/A	N/A	N/A	No	2/30+	(2) 1/4"	Plays custom ROMs	Expansion sound ROMs; opt. 6 analog outs, S/PDIF	$995
48/480	4 MB	1/4–1/64 w/swing	No	2/60	(4) analog; ADAT, AES/EBU	Digital modular synthesis; burns custom flash ROMs	32-channel RFX-32 FX/Mixer card; MIDI, word clock; S/PDIF	$1,795
48/480	4 MB	1/4–1/64 w/swing	No	2/60	(4 exp to 12 analog); ADAT, AES/EBU; S/PDIF	16 MB Orbit/Phatt sound ROM, int hard drive; digital modular synthesis	32-channel RFX-32 FX/Mixer; ADAT, AES/EBU,S/PDIF options	$2,495
48/480	4 MB	1/4–1/64 w/swing	No	2/60	(8 exp to 16) ADAT	Digital modular synthesis	MIDI x 2 exp; digital I/O, ASCII; resampling, ROM brd, ADAT I/O	$2,295
N/A	N/A	N/A	Yes	2/30+	(2) analog	Control knobs; plays back custom sound ROMs created with E4 Ultra Samplers	Expansion sound ROMs; polyphony/output/MIDI/ROM expansion hardware upgrade	$995
N/A	N/A	N/A	Yes	2/70	(6) analog + S/PDIF; balanced 1/4"	SuperBEATS	Exp. sounds	$1,349
N/A	N/A	N/A	Yes	2/30+	(2) analog (expand to 6+ S/PDIF)	Expandable sound sets; real-time controls SuperBEATS mode	12 pole filters	$995
N/A	N/A	N/A	No	2/70	(2) 1/4" TRS	Expandable sound set		$795
N/A	N/A	N/A	No	2/30+	(6) 1/4"; S/PDIF	32 MIDI channels; 4 real-time controls; plays back custom ROMs	Additional 16 MB and 32 MB sound ROMs	$995
16/384	>300,000	32d triplet swing	Yes	2/70	(6) 1/4" TRS; S/PDIF	Real-time controls		$1,329
N/A	N/A	N/A	Yes	2/30+	(6) analog; SPIDF	Expandable sound set; 12-pole filters; SuperBEATS mode	4 real-time controls	$1,295
N/A	N/A	N/A	No	2/30+	(6) analog; S/PDIF	4 real-time contol knobs; plays back custom sound ROMs	Expansion sound ROMs	$1,395
N/A	N/A	N/A	Yes	2/30+	(6) analog; S/PDIF	Expandable sound sets; 12-pole filters; SuperBEATS mode	Real-time controls	$1,295
N/A	N/A	N/A	Yes	2/30+	(2) 1/4"	4 real-time control knobs; SuperBEATs mod	Expansion sound ROMs	$995
16/384	70,000 notes (exp to 140,000)	Adjustable	No	2/40	Headphone			$1,695
256	256 patterns/ 16 songs	16th note; 3/4; 4/4	No	1/2 (overdrive)	1/4"	Pure analog synthesis; external audio input; MIDI to CV converter		$777
2 /0	64 steps	12T; 16; swing 16, 32	No	2/2	(2) 1/4"; headphone	Audio in for gating audio with patterns; realtime control		$399
10/0	Up to 64 steps per part	16; 16 swing; 32; triplets	No	2/12	(2) 1/4"	Resample; time motion sequencer; Smartmedia storage		$599
3 part motion sequencer	16 steps	N/A	Yes	2/7	(2) 1/4"; RCA	16-band vocoder; 3-part motion sequencer		$850
N/A	NA	N/A	Dual Polyphonic	8/102 inserts; 89 master, 3-band stereo EQ	(6) 1/4" outs; headphone jack	Sampler up to 96 MB; user expandable upgrades	SCSI; physical modeling; sound expansion; MLAN	$2,500
32/768	30,000 notes	Groove; reference; swing, shift	Yes	1/37	(8)1/4"; AES/EBU; XLR; optical KDS	Reads samples frm Akai, Roland, Ensoniq, AIFF, Wave	128 MB smpl RAM; 28 MB smpl ROM	$3,490/$4,000
N/A	N/A	N/A	No	2/9	(2) 1/4" stereo; headphone			$449
N/A	N/A	N/A	No	1/16	(2) 1/4"	Can link two mics for 64-voice polyphony		$550
N/A	N/A	N/A	Yes	2/163	N/A	24-bit stereo digital output; 4-20AE MIDI; stereo multi-strike recording	Polyphony expansion; orchestral ROM	$1,415
N/A	N/A	N/A	No	N/N	1/4"			$519
N/A	N/A	N/A	No	N/N	1/4"		Distortion	$319

SEE PAGE 174 FOR A COMPLETE LISTING OF MANUFACTURERS' CONTACT INFORMATION

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
MAM	MIDI Arpeggiator	N/A	N/A	N/A	16/0	N/A	No	N/N/N	No	N/A	N/A
Nord	Electro Rack	146/1	0/6	LP/No	0/6	0/1	No	N/N/N	No	N/A	(2) pedal
Nord	Nord Micro Modular	4/1	N/A	15 types	99	N/A	Yes	N/N/N	No	N/A	0
Nord	Nord Modular Rack	16/4	N/A	15 types	500	N/A	Yes	N/N/N	No	N/A	(1) switch; (1) exp pedal
Nord	Nord Rack2	16/4	N/A	24 dB BP, HP; LP/Yes	99	100	Yes	N/N/N	No	N/A	(1) pedal switch; (1) exp pedal
Quasimidi	Polymorph	16/4	N/A	24 dB LP; +12 dB HP	0/128	0/64	Yes	N/N/N	No	N/A	0
Quasimidi	QM-309 Rave-O-Lution	17/5	N/A	24 dB/12 dB LP	0/384	N/A	Yes	N/N/N	No	N/A	(1) footswitch
Red Sound Systems	Dark Star XP2	8/5	no samples	LP, HP, BP, notch/Yes	0/200	5/5	Yes	N/N/N	No	N/A	2
Red Sound Systems	eleVAta	16/8	no samples	LP; HP; BP; notch/Yes	0/200	8/8	Yes	N/N/N	No	N/A	2
Roland	JP-8080	10/2	N/A	LP; BP; HP; peaking/Yes	384/128	192/64	Yes	N/N/N	No	N/A	0
Roland	JV-1010	64/16	32 MB (exp to 48)	LP; BP, HP; peaking/Yes	895/128	64 Prest/ 32 User	Yes	Y/N/N	Yes/serial; Mac/PC	N/A	0
Roland	S4-32 Synthesizer	32/4	N/A	LP; BP; HP; Peak/Yes	128/128	0/64	Yes	N/N/N	No	N/A	(1) foot switch
Roland	SP-505 Groove Sampling Workstation	8 voice/4 part multitimbral	4 MB/expandable	LP/Yes to 128 MB	250/256	100	No	N/N/N	No	Smart Media	(1) pedal
Roland	SP-808 Exemix-studio	4/0	250 MB RAM cached from disk	HP; LP; BP	1,024 RAM	N/A	No	N/N/N	No	ZIP 250 MB (2x)	(6) assign knobs; D-Beam
Roland	VP-9000	6/6	8 MB (exp to 136)	LP/Yes	1,024 RAM	1 RAM	Yes	N/N/N	No	ZIP 250 MB	0
Roland	XV-5050 Synthesizer Module	64/16	64/0	(3) LP, BP; HP; Peak	1,280/128	Yes	Yes	Y/N/N	Yes/USB	N/A	N/A
Roland	XV-5080	128/32	64 MB ROM (exp to 512)	LP; BP; HP; peaking/Yes	1,152/128	64/64	Yes	Y/N/N	No	128 MB SmartMedia; SCSI	0
Sound Chaser	GigaDAW TK1 Analog	160/32	70 GB/768 MB	LP; BP; HP; notch	N/A	48/48	Yes	N/N/N	IDE; USB	Floppy; CD-ROM; hard disk	N/A
Sound Chaser	GigaDAW TK1 Digital	160/32	70 GB/768 MB	LP; BP; HP; notch	N/A	32/32	Yes	N/N/N	IDE; USB	Floppy; CD-ROM; hard disk	N/A
Studio Electronics	ATC-1	Monophonic	N/A	Moog 24 dB	512 RAM	0	Yes	N/N/N	No	N/A	CV/gate I/O
Studio Electronics	Omega 2	2/2	N/A	12 dB LP; BP; HP; BR; Moog 24 dB	256 RAM	128 RAM	Yes	N/N/N	No	N/A	0
Studio Electronics	SE-1	Monophonic	N/A	12 dB LP; BP Moog 24 dB	198 RAM	0	Yes	N/N/N	No	N/A	0
Studiologic/Fatar	Blue Chip OX-7 Virtual Tonewheel Drawbar Module	24/3	N/A	N/A	99/99	N/A	No	N/N/N	No	N/A	0
Studiologic/Fatar	Blue Chip Baby B Virtual Tonewheel Drawbar Module	24/3	N/A	N/A	99/99	N/A	No	N/N/N	No	N/A	0
Synthesis Technology	MOTM Analog Modular Synthesizer	1-4	N/A	LP; HP; BP/Yes	N/A	N/A	Yes	N/N/N	No	N/A	(2) CV, pedal
Vermona	Mars	1/1	N/A	LP/Y	128	0	Yes	N/N/N	No	N/A	(1) pedal
Voce	Electric Piano	32/3	N/A	BP/Yes	32/0	3/0	No	N/N/N	No	N/A	0
Voce	Micro B II	32/3	N/A	HP; LP/Yes	36/0	3/0	No	N/N/N	No	N/A	0
Voce	V5	Full/ 3	N/A	N/A	0/7	0/3	No	N/N/N	No	N/A	0
Wiard Synthesizer	Wiard Modular System	1/1	N/A	Multi-type resonant	N/A	N/A	Patchable	N/N/N	No	N/A	0
Yamaha	A4000	64/16	0/4 (exp to 128)	16/Yes	0/128	0/128	Yes	N/N/N	Yes/SCSI	Floppy	(5) assign knobs
Yamaha	A5000	128/32	0/4 (exp to 128)	16/Yes	0/128	0/128	Yes	N/N/N	Yes/SCSI	Floppy	(5) assign knobs
Yamaha	AN200	5/32	N/A	LP, HP, BP; BE/Yes	256/128	256/128	Yes	N/N/N	No	N/A	18 knobs
Yamaha	CS6R	64/19	28.8	12/Yes	N/A	N/A	Yes	Optional	Yes/serial; Mac/PC	SmartMedia	Breath controller
Yamaha	DX200	16/32	N/A	LP; HP; BP; BE/Yes	256/128	256/128	Yes	N/N/N	Y/Serial	N/A	18 knobs
Yamaha	EX5R	128/16	16/1	8/Yes	256/256	0/128	Yes	Optional	No	Floppy	Breath controller
Yamaha	QY700	N/A	N/A	N/A	N/A	N/A	No	N/N/N	No	N/A	0
Yamaha	SU700	N/A	N/A	N/A	N/A	N/A	No	N/N/N	No	N/A	0

# OF SEQUENCER TRACKS / PPQN	SEQUENCER MEMORY	TYPES OF QUANTIZATION	ARPEGGIATOR	# OF EFFECTS PROCESSORS / EFFECTS	# OF AUDIO OUTPUTS / TYPE	SPECIAL FEATURES	OPTIONS	PRICE
N/A	N/A	N/A	Yes	N/A	N/A	Split, up, down, random, chord; MIDI channel 1-16		$159
N/A	N/A	N/A	No	1/6	(2) 1/4"		Modeled B-3/sampled elec pianos; USB port to update	$1,699
N/A	N/A	N/A	Yes	1/30 (+)	(2) 1/4"	Mac and PC editor allows you to build a synth	3, 000 (+) presets avail from website	$749
N/A	16 steps	N/A	Yes	4/30 (+)	(4) 1/4"	Mac and PC editor allows you to build a synth	16-voice expander board	$1,899
N/A	N/A	N/A	Yes	N/A	(4) 1/4"	Analog modeling synth	PCMCIA cards with1200 presets, 400 performances	$1,399
4	N/A	N/A	No	16	4	Analog-style sequencer; AES synthesis; 2 audio inputs		$1,199
5/24	20,000 events	N/A	No	3/17	(4) RCA	Full synth features on drum sounds; 2 audio inputs	Sound expansions for drums and synth sounds	$899
N/A	N/A	N/A	Yes	N/A	(4) 1/4"	Joystick controller; virtual analog	Vocoder EPROM	$399
N/A	N/A	N/A	Yes	1/4	(6) 1/4"	Joystick control; analog modeling synth	Vocoder EPROM	$699
1/96	23,000 notes	Grid	Yes	3/19	L/R (str); headphone	38 knobs/sliders; line/mic ins; 12-bnd frmnt fltr/vcdr/robot. vcl morph	SmartMedia card	$1,595
NA	NA	N/A	No	3/49	(2) RCA; headphones	Built-in SR-JV80 session exp board; sound diver editing software bundled	1 SR-JV80 expansion slot	$595
N/A	N/A	ARP: 16th triplet	Yes	2/45	(2) 1/4"	Sub Osc; ring mod; osc sync; chord memory		$595
4	15,000 events	8 4 w/swing	No	1/26	(2) RCA	S/PDIF input; chop function; pitch	BPM adjust	$395
8	N/A	Grid	No	1/149	(4) RCA	DBeam, COSM effects (incl. guitar amps, microphone modeling)	SP-808-OP1; SP-808-OP2 expansion boards	$1,695
N/A	N/A	N/A	No	3/40	(6) 1/4"	Variphrase processsing	DR-10/ DR-20	$3,295
N/A	N/A	N/A	No	5/90		(4) 1/4"; (2) S/PDIF; (2) SRX Slotz Editor software; (2) 24-bit S/PDIF outs	SRX expansion	$995
N/A	N/A	N/A	No	5/96	(4) 1/4"	Word clock; R-BUS; supports Akai, Roland, AIFF, WAV libraries	SmartMedia; SCSI CD-R; SCSI HD or removable media	$2,495
N/A	N/A	N/A	No	3	8-channel 24-bit analog I/O; S/PDIF (coax)	3U rackmountable; networkable; Tascam GigaStudio 160 installed with over 4 GB of samples included; removable drive bay	64 MIDI channels; removable hard drives	$3,099
N/A	N/A	N/A	No	3	32-channel ADAT lightpipe; S/PDIF (coax)	3U rackmountable; networkable; Tascam GigaStudio 160 installed with over 4 GB of samples included; removable drive bay	64 MIDI channels; removable hard drives	$2,799
N/A	N/A	N/A	No	N/A	(1) 1/4"	2 LFOs, 3 envelopes; ext in; plug in filters , 2 VCOs per voice	Additional filter cartridges: SEM,303,2600	$1,099
N/A	N/A	N/A	Yes	N/A	RCA; 1/4"	3 LFOs, 3 envelopes; sub osc, 2 ext ins, 2 VCOs per voice	2 addtional filter slots per voice	$1,995
N/A	N/A	N/A	No	N/A	(1) 1/4"	3 LFOs, 4 envelopes; ring mod;osc sync; 3 VCOs per voice	External input	$1,699
N/A	N/A	N/A	No	1/6	(2) 1/4"	Drawbars; rotorsound simulator	VP-26 pedal $39; PS-10 footswitch $18	$1,595
N/A	N/A	N/A	No	1/6	(2) 1/4"	Drawbars; rotorsound simulator	VP-26 pedal $39.95; PS-10 footswitch $18	$895
N/A	N/A	N/A	No	2/4	Multiple 1/4"	5U tall; fits standard studio racks; 18 different module types (VCO, VCF, etc.)		$89-$499
N/A	N/A	N/A	No	N/A	(1) 1/4"		Mars DAF1 rack controller for multi-mode filter	$495
N/A	N/A	N/A	No	1/4	(2) 1/4"	Digital model based with analog effects		$579
N/A	N/A	N/A	No	1/4	(2) 1/4"	Half-rack organ simulator	Spin II rotary speaker simulator	$579
N/A	N/A	N/A	No	1/4	(1) 1/4"	Drawbar organ synthesizer	Spin II rotary speaker simulator	$975
N/A	N/A	N/A	No	N/A	N/A	Complete modular system	Built-to-order; several modules available.	$2,999 and up
16/480	100,000+ notes	N/A	No	3/96	(4) 1/4"	Loop divide, loop remix; CD burning capable (data and Red Book audio)	Output expander; internal HDD, zip drive	$1,595
16/480	100,000+ notes	N/A	No	6/96	(4) 1/4"	Loop divide, loop remix; CD burning	Output expander; internal HDD; zip drive option	$2,295
4/4	2,048	16th swing	No	1/24	(2) 1/4"	2 scene memories/voice	4 track free RG/voice	$630
16/480	N/A	N/A	Yes	2/130	(4) 1/4"	Phrase clip sampling 4 MB; stereo A/D input; scenes	PLG series expansion boards x 2, 6 types available	$1,495
4	2,048	16th/swing	No	1/24	(2) 1/4"	2 scenes/voice	4 track free LG	$630
16/480	30,000 notes	Percentage, destructive, non-destructive, groove	Yes	2/122	(4) 1/4"	2x A/D inputs; 5 types of extended synthesis; sampling	Flash ROM 8/16 MB, SCSI	$2,195
48/480	N/A	Input, percentage, groove templates, user definable	No	1/3	N/A	XG tone generator with 480 normal voices; 11 drum kits; 3.5" FDD		$1,495
42/480	N/A	Step, real, pattern, linear	No	N/A	N/A	Auto looping and auto sync of audio to MIDI or MTC; 20 songs		$1,495

SEE PAGE 174 FOR A COMPLETE LISTING OF MANUFACTURERS' CONTACT INFORMATION

SYNCHRONIZERS

MANUFACTURER	PRODUCT	SMPTE	JAM SYNC	FREEWHEELING	MTC/MMC	SPECIAL FEATURES	PRICE
Aardvark	AardSync II-	No	No	No	N/N	WC, 2X WC, 256 superclock; AES/EBU;' video blackburst lock; low-jitter clock;	$1,795
Aardvark	Sync DA-Word Clock Distribution Amp	No	No	No	N/N	Generates word clock from AES/EBU; 6 word clock outputs; supports Digidesign 256 superclock	$845
Aardvark	TimeSync II-Universal Time Code Synchronization	Yes	Yes	Yes	Y/Y	Derives ultra-low jitter word clock/Superclock & MTC from LTC/VITC in; locks in 4 forms	$1,295
Digidesign	SR 3	Yes	Yes	Yes	N/N	Repairs and generates time code, video reference, or internal	$699
Digidesign	SR 15 Distripalyzer	Yes	Yes	Yes	N/N	SMPTE analyzer, distributor, reshaper, error printer; video reference	$1,599
Digidesign	SYNC I/O	Yes	Yes	Yes	Chases LTC directly	Low-jitter clock design, word clock I/O up to 192 kHz accurate; supports industry-standard pull-up/pull-down rates for film/video; 9-pin dual device control	$2,095
Digidesign	Universal Slave Driver (USD)	Yes	Yes	Yes	Y/Y	Supports industry-standard pull-up/pull-down rates for film/video; 9-pin connectors; insertable Window-Burn	$2,095
JLCooper	dataSYNC2	Yes	No	No	Y/Y	ADAT interface; drives sequencers/DAWs w/o track; MTC/SMPTE/MIDI clock with song position pointer, bi-dir MIDI	$300
JLCooper	PPS-2	Yes	Yes	Yes	Y/N	Reads/gens SMPTE tc and converts SMPTE to MTC or DTL	$170
Lucid	GENx6	No	No	No	N/N	Sample clock source that also functions as a 1x6 clock distribution amplifier	$499
Lucid	GENx6-96	No	No	No	N/N	Sample clock source that also functions as a 1x6 clock distribution amplifier	$699
Lucid	LTC, VITC; MTC; 24, 25, 29.97, 29.97d, 30, 30d	Yes	Yes		Y/Y	Converts Song Pointer sync (Smart FSK) to MIDI clock	$135
Midiman	Syncman	Yes	Yes	No	Y/N	Syncs sequencers to tape or video	$200
MOTU	Digital Timepiece	Yes (LTC, VITC)	Yes	Yes	Y/Y	MTC; Sony 9-pin; video, ADAT, DA-88, S/PDIF sync; 0.1% pull-up/down sample rates (44.1/48 kHz)	$995
Rosendahl	BIF	Yes	Yes	Yes	Y/Y	Positional LTC and MTC full/MMC locate in jog/shuttle; LTC and MTC gen from bi-phase signals	$799
Rosendahl	LIF	Yes	Yes	Yes	Y/Y	Generates LTC, MTC from LANC-embedded code; positional LTC and MTC full/MMC locate in jog/shuttle	$749
Rosendahl	MIF3	Yes (LTC)	Yes	Yes	Y/N	Reclocks LTC for stable output from MTC input; LTC stationary frame output for MTC full frame	$549
Rosendahl	Nanosync	Yes	No	No	N/N	Low-jitter master clock generator; S/PDIF, AES, (6) word/super clock outputs; (4) video outputs; video sync generator	$1,340
Rosendahl	WIF2	Yes (LTC; VITC)	Yes	Yes	Y/N	Word clock/superclock out from LTC or video onput; film/video pull up/down; MTC out for VITC jog/shuttle	$799
Steinberg	Steinberg Time Lock Pro	Yes	Yes	Yes	Y/Y	Word clock or Digidesign superclock lockup less than 0.4 seconds	$999
Swissonic	WD 8	Yes	No	No	N/N	(2) WC in; (8) WC out	$849

By Bobby Owsinski

ISRCS

ISRC stands for International Standard Recording Code and was developed by ISO (International Organization for Standardization) to identify sound and audio-visual recordings. It is officially known as International Standard ISO 3901. ISRC is a unique identifier of each recording that makes up the album. If a recording is changed in any way, it requires a new ISRC, but otherwise it will always retain the same ISRC, independent of the company or format it is in. An ISRC code may not be reused.

The ISRC is contained in the subcode (Q-channel) of a CD (see "CD Subcodes" on p. 42) and is unique to each track. Each ISRC is comprised of 12 characters, as follows:

Length (characters)	Description
2	Country
3	First owner (allocated by the RIAA)
2	Year of recording (the last two digits)
5	Designation code (assigned by the first owner

Sometimes it's hard to tell when a new ISRC is needed. The following list should help eliminate any confusion:

- Remixes of recordings produced in the same recording session without any change in orchestration, arrangement, or artist require a new ISRC per recording
- Playing time changes require a new ISRC.
- Processing of historical recordings requires new ISRCs.
- Back catalogs require a new ISRC for first re-release.
- Recordings sold or distributed by an agent use the same ISRCs.
- Compilations without editing of individual tracks may have the same ISRCs. ■

This article was previously published in *The Mastering Engineer's Handbook* (ISBN 0-87288-741-3), a product of ArtistPro Publishing (www.artistpro.com), and is reprinted by permission of the publisher.

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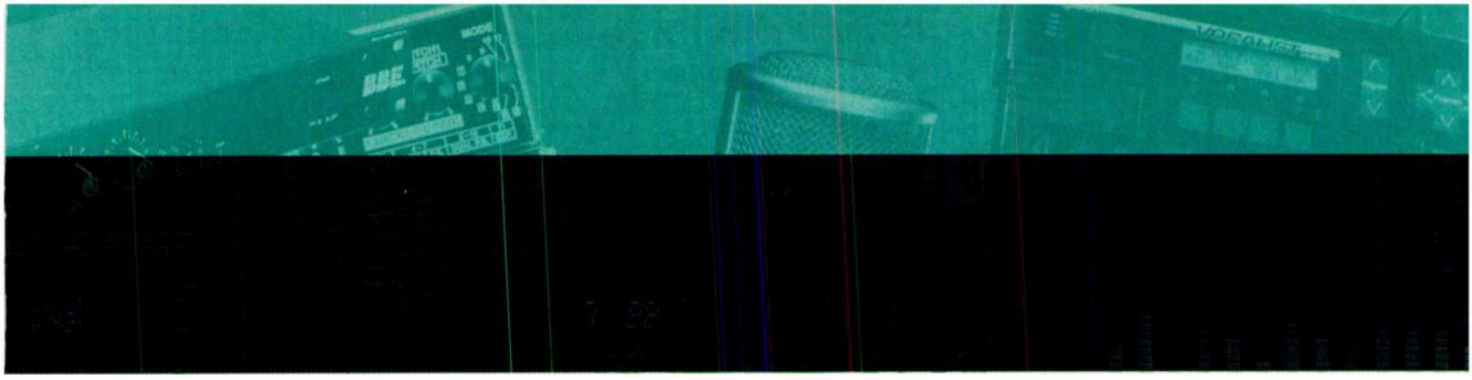

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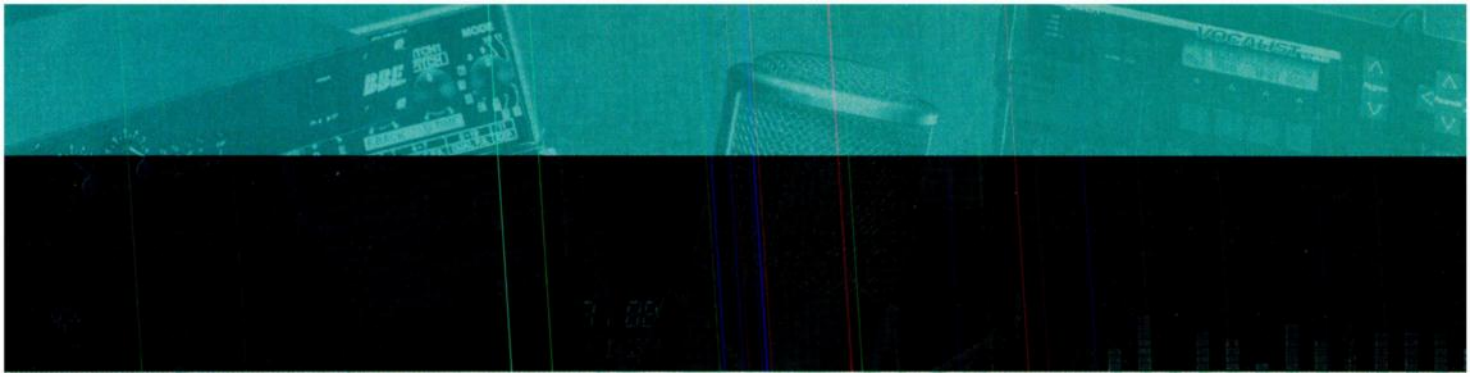

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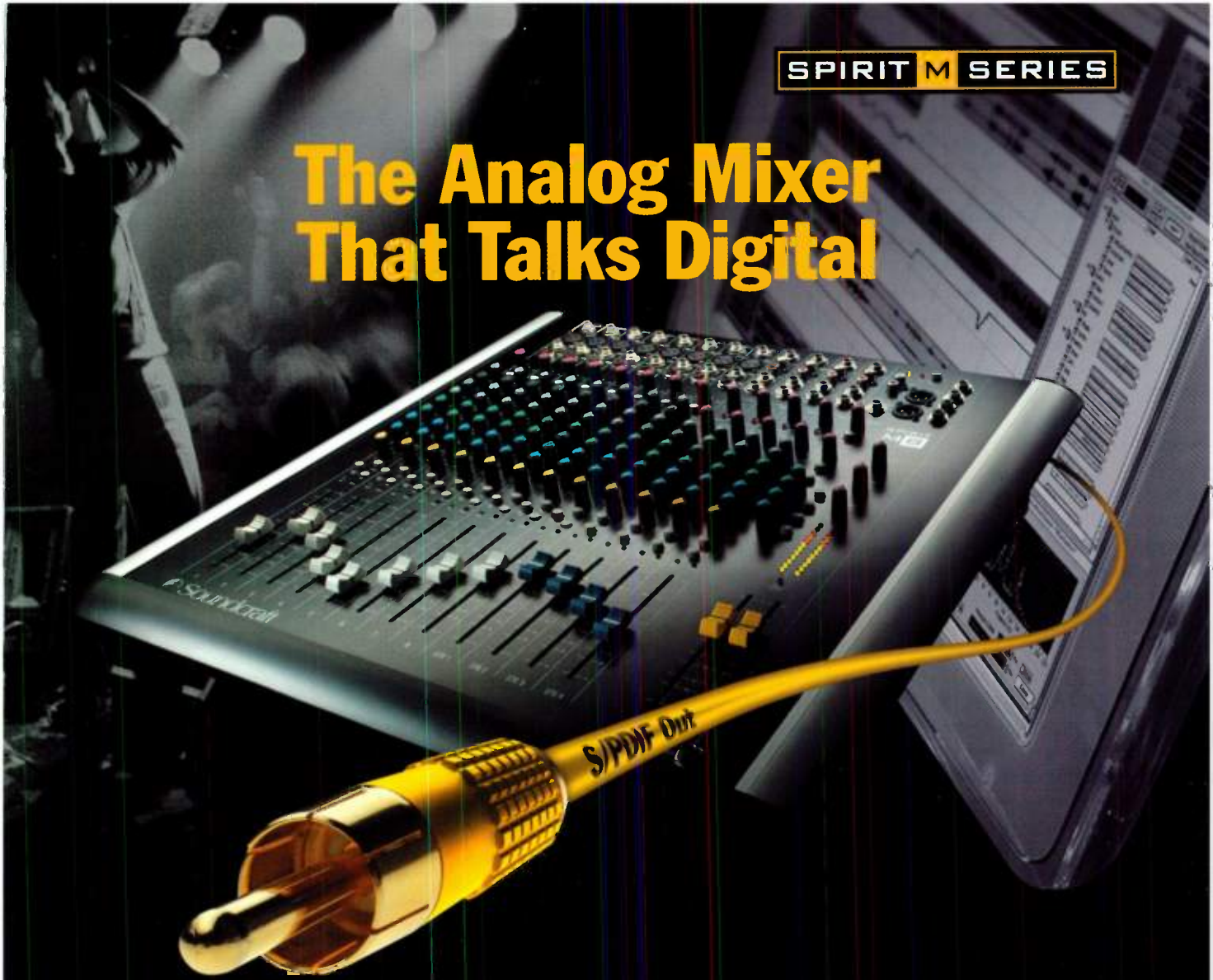

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AVALON DESIGN

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