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Recording

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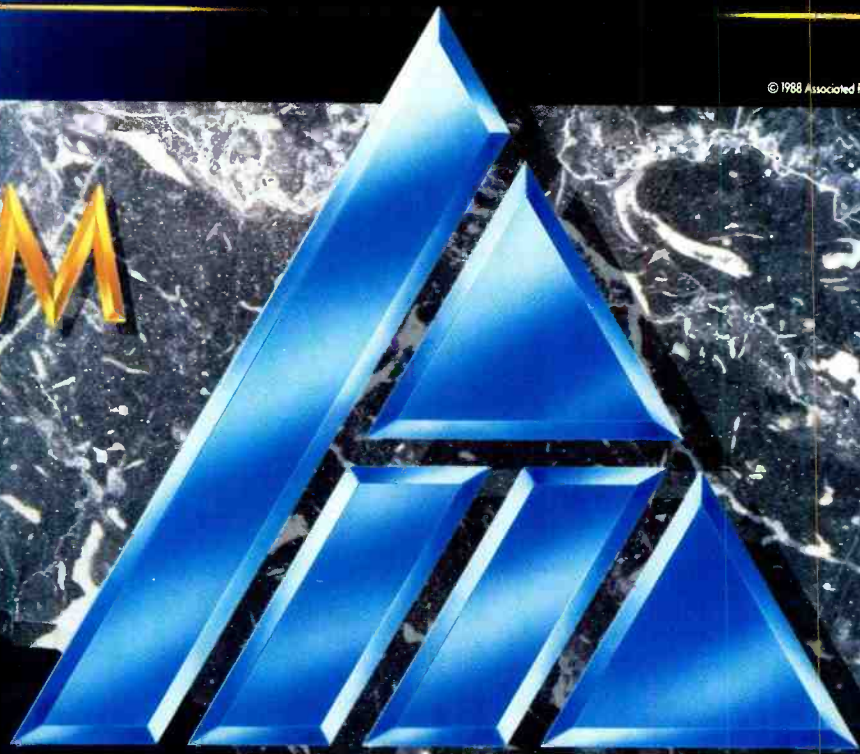
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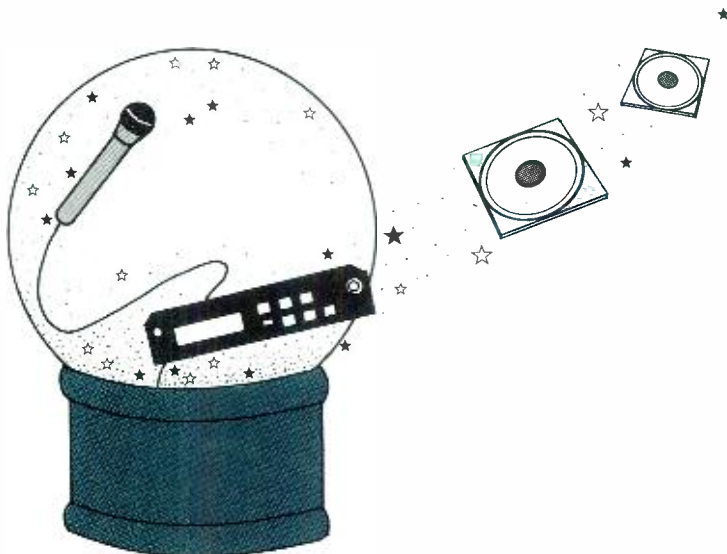
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On the Cover

The 1989 Black Book consists of Product, Manufacturers, Fax and Dealer/Distributor directories, plus a year-end article index, trade association directory and convention calendar.



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Microphone Technique Part 2

Last month, sound source(s), the size and sound of the acoustic space, the style of music and the arrangement were discussed as important components of good microphone technique. I'll begin Part 2 with mic placement; an important part of good technique, but only *one* of the 10 listed previously.

Placement

I'll never forget the first live string session I worked on. My partner, Larry, and I had to ask the studio owner what mics to use and where to put them. After setting up correctly, we thought, we brought up the faders, got some initial levels, and began rehearsing the parts with the other tracks. As I recall, there were eight violins, four viola and two cellos; the meter was running.

The setup consisted of condenser mics allocated one for every two chairs and positioned about 3 feet above the plane of the instruments. (We had been studying our books, trades and other resources trying to prepare for this session, but, of course, the one-mic-for-two-chairs formula still leaves a lot of room for error.)

You won't be surprised to hear that the strings did not sound warm, smooth and inviting (it was a love ballad), they sounded awful. Well, about a half hour of this was all we could take. We finally called the studio's owner—at home—in the middle of the night—and cried, "Help!"

His suggestions that the mics were probably too close to the instruments and not working as a group, but fighting each other, proved correct. He recommended that we back off a few feet, then fine-tune what we heard by subtly repositioning the mics.

We learned a valuable lesson; even a difference of an inch or two can make a world of difference in the overall spectrum that a microphone is able to capture. This holds true for a single mic and compounds as more mics listen to the same acoustic source and space. Not only is the mic operating in a three-dimensional space, (it's horizontal and vertical polar axes, and the distance from the source) but the mic

and the sound source are working together in an acoustic space that imposes its own three-dimensional characterizations.

You can, perhaps, visualize the critical effects of mic placement in this way: Multiply the 3D perspective of the mic and source times the 3D effects of the room. This image may help you understand the importance of the slightest positioning changes.

Available mics

I've touched on this a little already, but there are more considerations. If you are tracking a large rhythm section and have a limited number of mics to choose from, you will need to prioritize your selections carefully:

- What are the most critical or difficult sound sources to deal with?
- Can you use one mic and a DDL instead of two mics? Where?
- What instrument would be easiest to overdub or redo, if necessary?
- Where can you use a DI instead of a mic?
- What is the bandwidth of the source?
- What is the dynamic range of the source?
- What acoustic barriers or limitations are present?
- How can you use isolation or ambience to stretch your resources?

Number of mics used simultaneously

Here we get back into pattern selection and placement. If you've got 15 open mics in the same room, you're going to get a fair amount of leakage and room-sound no matter how dry the room is. Proper knowledge and understanding of the individual polar responses is crucial. One of my favorite patterns (because it's worked so well in so many different situations) is the Figure 8. Generally Figure 8s exhibit two very smooth on-axis lobes and almost complete cancellation off-axis at the "waist."

This pattern allows the engineer to focus the mic tightly on the sound source, capture a portion of the room sound and be placed in such a way as to control leakage from other unwanted sources substantially. (Of course the more Figure 8s you run simultaneously, the more challenging the placement.)

Abilities of the musician or vocalist

Vocalists probably present more complex requirements to the engineer and the signal path than any other sound source. Most vocalists place at least these demands on microphones: wide dynamic range, immunity from wind blasts, and well-controlled proximity and on-axis continuity.

The human voice is capable of producing such an extended dynamic range that it can easily overload the entire signal path if allowed—even with a variety of gain control devices and techniques. However, if you fully understand all the factors relating to the project, including the style of the music; the arrangement; room acoustics; and the singer's range, power, experience and style, you can select a suitable mic and placement—minimizing other signal processing, if that is the intent.

Number of channels and/or tracks

This often relates to the number of mics being used simultaneously, but not always. If the console you're using has a limited number of available input channels, you may be forced to draw from your experience when asked to cover more area or instruments with fewer mics. This isn't always easy or desirable, but *necessity/reality* often win out. Understanding the pickup patterns and "reach" of your mics might save the day.

The studio technique of one-mic-for-one-source-on-one-track recording is fairly common. This approach clearly leaves a lot of room for the timbral manipulation of the discrete track(s). But in a situation where you must do a live submix of several sound sources, microphone selection and placement become critical. You now have to capture every possible nuance in the tracking mode; there won't be the luxury of tweaking the individual parts during the mix. Proper selection and placement can make your job considerably easier.

For example, in a live to 2-track session, if we make the assumptions that the signal path is clean (dare I?), microphone technique will make or break the sound, and probably the ultimate success of such a recording.

Continued on page 16

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LETTERS

What if...

From: Norton Lawellin, Track Record Studios, St. Paul, MN.

I particularly enjoyed your July issue, especially the articles on analog 2-inch tape machines and noise reduction, the digital noise modulation, tape spec and mastering articles, and the Bruce Swedien interview (more of these, please!) about his use of multiple combination analog-digital tape formats. It seems that the entire issue was devoted to analog this or digital that! While reading, I couldn't help but wonder what would have happened if the two formats were invented in reverse order.

I dreamed I had always been a little disappointed in my digital equipment. The stuff never seems to look at my signal often enough, so what I get back isn't always accurate (quantization). We learned a long time ago that 8-bit wasn't enough; 12-bit sounded better, 14-bit better still, and then a lot of tape machines were manufactured at 16-bit quantization. If this was a good enough bit-rate for multi-track recording, why are some companies experimenting with 24-or-more bit?

And while we're at it, what should be the proper sampling rate? It seems to me that CDs are designed a little "tight." Basically, they wanted a 20kHz bandwidth, and built an aliasing filter to be *wide open* at 20kHz and *way down* at 22kHz. Doesn't

a filter this steep screw up at 17.5kHz too? Phase? 22kHz has to be sampled twice a second, which gets you 44kHz and the .1kHz is for error. Seems to me that *nothing* ever really works this good. I'm not sure we really quit hearing at 20kHz anyway. Sure I can't hear a 25kHz tone, but to me, the music sounds different if these frequencies aren't there.

But just the other day, a rep showed me a new tape machine that promises to revolutionize the recording industry—it's called *analog* recording! Surprisingly, it costs only a fraction of what a digital machine costs. It's a very forgiving medium, and has *tons* of headroom. The prototype machine was flat for practical purposes from 40Hz to 26kHz. Since there is no quantization, what you put in is what you get out. As an added benefit, it can automatically add a touch of compression, so dynamic range doesn't go beyond what is reasonable.

And—check this out—you can rock the reels back and forth and hear the *actual* recording! No electronic editor needed! You simply take a razor blade, cut the tape and paste the sections back together in any order you want, with—are you sitting down?—no glitches! The only negative comment I heard about the machine is that there is the faintest hint of noise as a result of the recording process, which doesn't seem to be a problem at all for most pop music.

OK, enough dreaming. The reality is that for every engineer I've met who thinks digital recorders are fantastic, I've met an equal number who want no part of it. I've met people who are trying to replace their private music collection with CDs, and those who are buying black vinyl classics at garage sales, fearing they won't be available anymore.

The important thing seems to me to be to accept new technology when it is beneficial, but not to chase new technology only for technology's sake. My hat is off to Bruce Swedien for having the best of both worlds!

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Send letters to RE/P, 8330 Allison Ave., Suite C, La Mesa, CA 92041. Letters may be edited for length and clarity.

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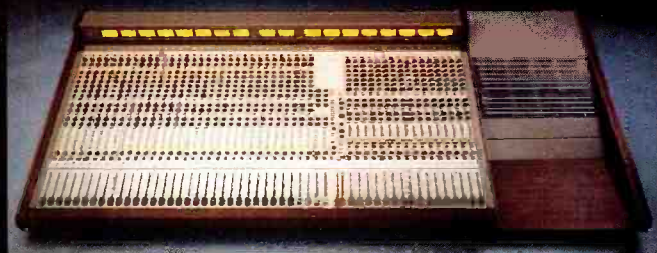
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Nine months after its formation, **Neutrik USA** has announced its regional sales organizations. The companies are: The Macinnis Co., Norwood, MA, 800-544-1014 and 617-762-8090; Lamtec, Manlius, NY, 315-637-3738; Synergy Sales, New Brunswick, NJ, 201-828-5090; Lowery Associates, Broomall, PA, 215-356-5300, and Snowdon Center, MD, 301-381-0225; Cartwright & Bean, Norcross, GA, 404-368-0160, Raleigh, NC, 919-876-4130, Charlotte, NC, 704-536-0303, Orlando, FL, 305-429-4531, Deerfield Beach, FL, 305-429-3400, Knoxville, TN, 615-693-7450; Memphis, TN, 901-362-8345, Jackson, MS, 601-981-1170, Huntsville, AL, 205-830-1540, and Covington, LA, 504-892-1780; Electronic Representatives, Indianapolis, 317-894-1414, and Mishawaka, IN, 219-259-0365; RMP McBride Corp., Lombard, IL, 312-932-9090; RC Merchant & Co., Farmington Hills, MI, 313-476-4600; Lowell Kangas & Associates,

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People

The University of Miami's Music Engineering Technology program has announced that the following graduates have found jobs in the industry. **Jim Laky** is the new pre-mastering engineer at Denon Digital, Madison, GA. **Loren Silber** is a mixing engineer at Editel Chicago. **Linda McKittrick** is a marketing representative for BGW Systems. **Andrew Scheps** is field service representative in the Los Angeles office of New England Digital. **Steve Toback** has been appointed studio manager at EFX. **Guy DeFazio** will return to Lion Share Studios as maintenance engineer after one more semester. **Juan Punyed** has joined Sony's Coral Gables, FL, office to cover the Latin American broadcast market. **Art Gonzales** has joined Sony's Teaneck, NJ, office in the pro audio division. **Rob Sutton** is an engineer at the Power Station in New York. **John Portuondo** is at New River Studios. **Pelayo Montoto** is at Studio Center. **Chriss Scherer** is working at radio stations SVCG and WTMI in Miami.

Hudson Audio Video Enterprises has announced four appointments. **Raphael Horton** is a customer service representative. **Timothy Wyman** is a duplication and conversion sales specialist. **Robert Weinman** is advertising manager. **Cheryl Krein** is an administrative assistant.

Leslie B. Tyler has been named vice president for technology for Carillon Technology.

He will head a newly formed department, CTI Research, that will be responsible technology development for all of Carillon's companies, including dbx.

Jim Rosenberg, product manager at E-mu Systems, is now also responsible for the company's advertising and promotion.

Elissa Szieff has joined Apogee Electronics as OEM sales manager.

Tom Irby has joined Harrison Systems as advanced technology product manager.

Morton B. Weiner has been named vice president of sales for Memory-Tech.

QSC Audio Products has announced two appointments. **Tom Day** has been promoted to service manager. **Neil Pedinoff** has joined the company as senior engineer.

Tore B. Nordahl has been named vice president and general manager of Studer Revox America.

Bill Traue has joined Gentner Electronics' customer support team.

Jim Bonis has been named national sales and marketing manager at Applied Research & Technology.

Correction

Because of publishing deadlines for the October issue, information about two AES exhibiting companies was not included. **DIC Digital** manufactures R-DAT tape in a variety of lengths. **Audio Intervisual Design** is the U.S. distributor for Sanken Microphones.

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MANAGING MIDI

By Paul D. Lehrman

Drifting and Drifting

As studios rely more on MIDI sequencers, they are also asking more from those sequencers' synchronization capabilities. Using a sequencer's 16 or 32 channels as "virtual" tracks to a multitrack tape recorder in a post-production situation is no longer just a question of laying down click for it to follow.

Now, studios want their MIDI synthesizers, samplers, and processors to lock up to video and audio tape with sub-frame, if not phase-lock, accuracy, and be able to start any time, anywhere, and jump in, perfectly locked, right away.

We've talked about sync problems before, but they're worth bringing up again, because the landscape is constantly changing. There are now on the market several sequencing programs and devices that respond to MIDI Time Code, which is potentially the best way for tape and sequencers to talk to each other. Some of these sequencers are oriented toward music composition, while others are geared more toward sound-effects editing. But what they have in common is that they use external MIDI timing commands, based directly on SMPTE numbers, as reference points for executing MIDI instructions.

Of course, locking a sequencer to SMPTE is old hat, as long as the SMPTE information is first converted into MIDI clocks and pointers. The disadvantage of such a system is that you have to know the starting time and the tempo of the sequence being played ahead of time, and program it into the SMPTE-to-MIDI converter, so that the converter knows how to calculate beats and bars from raw time data.

Change a start time, bar length, or tempo, and you have to reprogram the converter. MIDI Time Code, which allows you to change tempos at the *sequencer* end to your heart's content, is what's new. And it's so new that it doesn't quite work yet.

You can gain some insight into the prob-

lem by trying a couple of experiments. You need two computers running different sequencing programs (actually, one can be a hardware sequencer) that respond to conventional MIDI sync and to MIDI Time Code. The two sequencers should be loaded with identical programs, preferably ones that are heavily rhythmic. (If the programs can read MIDI Files, load the same MIDI File into both. Just make sure they are set to the same timing resolution, or one may run twice as fast as the other.)

Stripe some SMPTE code onto a tape. Play the tape and route the time code signal to a SMPTE-to-MIDI-Clocks-and-Pointers converter, and set the converter to a constant tempo. Send the converter's MIDI output to both sequencers. Roll tape. The sequences should lock to each other with a precision that would bring joy to the heart of a Big Ten marching band director.

When it comes to converting SMPTE to MIDI clocks, no two devices will agree on how fast to generate them.

Now get a second SMPTE-to-MIDI converter. Set it to the same tempo as the first. Slave one sequencer to the first converter and the other to the second. Roll tape and listen carefully. Over a period of time, the two sequences will probably drift apart. Start the tape somewhere in the middle, and the two sequences will probably start together, but inevitably will drift as time goes by.

Now hook up a SMPTE-to-MIDI *Time Code* converter, and send its output to the two sequencers. This time, you will probably find the two sequences go out of sync, and then go back in, and continue to go in and out. Stop the tape somewhere in the middle, and restart it. The two sequences may be out of sync for a bar or two, but then they will lock together. Before long, however, they will start to oscillate in and out again. Over the length of the sequence, the differences may average out, so that they do stop at the same point, but at any one moment during playback, there may be a discrepan-

cy of several hundred milliseconds.

What the heck is going on here? Well, there are actually several factors at work. When it comes to converting SMPTE to MIDI clocks, no two devices will agree perfectly on how fast to generate the clocks, because each device will introduce a certain amount of round-off error.

Let's say two such devices are accurate to within 0.02%. When set to 120 bpm, one device may generate clocks at 120.02 bpm, while the other may send clocks at 119.987. Both are well within tolerance, but they will disagree with each other at the rate of 33 beats per thousand minutes, which translates to being one frame off after two minutes—and moving further and further apart.

When it comes to starting a sequence in the middle, the two synchronizers will calculate the song pointer from the incoming SMPTE number and come up with the same result, so they will start the sequences at the same point, but from then on they're on their own. There is also the problem of tape or data dropouts. If the SMPTE code goes bad for a moment, some synchronizers will "flywheel" and continue to generate clocks for a few frames, while others will stop dead. Because the only way sequencers know where they are while they play is to count clocks, this can result in serious discrepancies. And if a clock byte on the MIDI line should somehow go astray, the sequencer would never know.

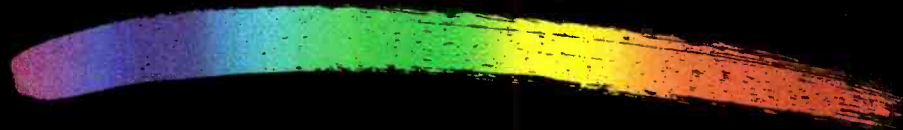
MIDI Time Code poses a different set of problems. A sequencer that reads MTC will derive its internal clock from the code's quarter-frame messages. To compensate for round-off errors, dropouts, or bad data, a well-designed MTC sequencer will also read the *absolute* location of the time code as it comes in. (The quarter-frame messages "nibble" the location information, so that the receiver can determine the true location every two frames.) If there is a discrepancy between where the sequencer *thinks* it is supposed to be and where the code *says* it's supposed to be, the sequencer can minutely speed up or slow down to match the code. If this sounds familiar, it's because exactly the same thing is done by tape-machine synchronizers, only here there are no moving parts.

The problem is that this "chasing" function is handled in different ways by different sequencers. In fact, its behavior can

Continued on page 16

Paul Lehrman is RE/P's electronic music consulting editor and is a Boston-based producer, electronic musician and freelance writer.

Professional

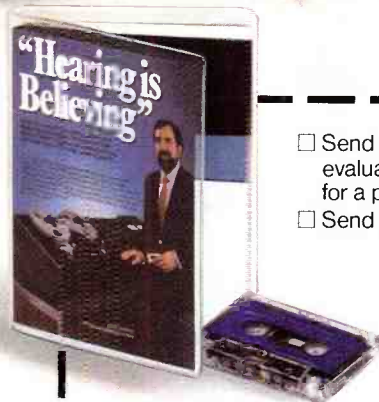


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SPARS ON-LINE

By John Rosen

New Studio Survival Strategies and Support Systems

Operating a successful audio business is very easy if everything just naturally falls into place. Unfortunately, for most small entrepreneurial ventures, it doesn't happen that way. Having special skills as a guitar picker, knob twister or producer is not enough. You've got to fit into the entertainment business. Those two words hold very special and clear meanings for success. The entertainment-oriented environment your facility offers must be of a very high quality to satisfy the demands of a sophisticated industry. The business practices must be of equally high quality to show a profit. Having no entertainment quality equals no future; no business quality also equals no future.

If you're like most of us, your specialized skills are limited to those talents that got you into this business in the first place. Good managers recognize the importance of having a team of people who can provide complementary, not redundant, skills to their business.

Let's take a look at some of the players you may want to have on your team. Remember, each person is important, and everyone must work together if you're going to win the game and get the chance to play next year.

Bankers

Find a banker familiar with the overall style of business in your community. If the banker understands the audio business, all the better, but don't get your hopes up. Bankers are great at granting loans for familiar types of ventures, but they get a little nervous if they have to stick their necks out during loan approval committee meetings.

You will need to educate them, and they will need to educate you. Find out the rules by which the bank operates, and welcome suggestions for alternate plans. Just about any bank can come up with a bucket of various financing packages if

John Rosen is president of Fanta Professional Services in Nashville, and regional vice president of SPARS.

they want to help.

Your banker can provide another service. He can help you to build a network of advisers. Listen to every word for the meaning, but also for the "feel" of the communication. The banker must survive in a vicious business and chances are his methods and style will be in line with other business people you must deal with.

Accountants

An accurate set of books is the only way to gauge how your business is doing. Personal computers have made small-business bookkeeping as easy as filling out a checkbook. The software is readily available. Integrated systems can handle payables, receivables, payroll, inventory and a comprehensive general ledger. Each category can be printed out in a form that is easily scanned and understood. You don't need an expensive package, but you do need one that is flexible enough to satisfy your needs, yet standardized to meet the requirements of the IRS.

Accountants charge a lot, so if you can take care of the tedious work, you will save a bundle. You should be able to use your computer on a regular basis to determine the status of your business without consulting an accountant. If you can't, you've got a problem and you'd better solve it *fast*.

Qualified accountants are essential, and good ones will be aware of various financing alternatives. They can sometimes put you in contact with those interested in investing in small business, or those who have specialized financing skills.

Lawyers

Chances are you won't need a lot of legal help at first, but you'd better find it before the need comes up. There are many types of legal practices. You need a lawyer who handles small businesses and is willing to teach you the ropes. If your legal adviser can't explain things to you, then this person probably can't explain to a judge, jury or the IRS. Make sure that the lawyer and the accountant have a flawless working relationship. If they don't get along, *you* will be the one to suffer. Try to work out a program with your lawyer that defines exactly what you will pay for each of the services. A good law office will be glad to work out a plan that lets you afford the use of their name and organization while using the support of their clerks and hired lawyers. You don't need the principle partners in the law firm for the simple work.

Save the heavy artillery for when you *really* need it.

Insurance agents

A good agent does a lot more than peddle you a policy. The agent should learn about the audio business and assure you that the unique needs of our industry are met. Recording studios are usually outside of regular business categories. The agent may have to look around for the proper version of marine (i.e., special) coverage. Great deals are out there if the agent is willing to dig and you are willing to supply the correct information.

Organizations

What you get from your community depends on what you contribute. Most trade, arts and philanthropic organizations can get along fine without you. You need them more than they need you. Use these contacts to build your personal business network. Even if you contribute to special trade organizations, you still need to support the local and national community funds. Remember, they are looking for The Three W's: Wealth, Wisdom and Willingness. If you can't afford much, compensate with the other two. Let people know that you care about the community as well as your own business. In this environment, it is very acceptable for a new business owner to ask questions of the older and more established business folks. You can't make it alone; you need the friendship that exists away from the business playing field.

Advertising and public relations

Morty Wax, the famous publicist, once said, "A terrible thing happens when you don't promote—nothing!" The decision to spend some money on advertising is easy but the content of the ads and the proper placement is difficult. In addition, you must make an effort to educate your promotional agency properly. They need to know the right buzz words that will communicate your message to your potential clientele.

Many audio publications can be very helpful in helping you to advertise effectively. They have production and editorial departments that are willing to help. Nothing makes them look better than a successful advertiser. No responsible periodical will run editorial material about your company just because you bought an

Continued on page 16

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UNDERSTANDING COMPUTERS

By Jeff Burger

Printers

One of the most common peripherals for computers is the printer. They come in various flavors. For starters, they can be either parallel or serial, and some even offer both options. In most cases, a standard cable is all that is required to connect the printer to the computer physically.

Let's take a look at the physical differences between different types of printers. Daisy-wheel printers get their name because the print wheel has a central hub with a series of spokes sticking out (presumably resembling the petals of a daisy), each with a character at the end. These characters are usually metal type, like you'd find in a typewriter. The printer rotates the wheel to the appropriate position and strikes the inked ribbon which, in turn, hits the paper. Daisy-wheel printers are one form of letter-quality printer, meaning that the characters are smooth and well formed.

Dot-matrix printers get their name from the design of the print head. Instead of having preformed characters like a daisy-wheel printer, the print element of a dot-matrix printer consists of a matrix of closely grouped pins that are fired in different combinations against the ribbon to form the desired character on the paper. The number of pins that form the matrix determines just how refined the characters look.

Most dot-matrix printers offer at least two quality/speed modes. Draft mode is faster because it uses a single pass of the print head. The quality can be enhanced if the printer has overstrike mode. The characters are printed once, the paper is advanced a fraction of an inch and the same line is printed again. This tends to fill in some of the gaps left by the first pass and make the letters appear darker and more refined. The term NLQ (near-letter-quality) refers to either this overstrike mode or a pin density high enough to create characters that approximate letter-quality to the naked eye. The unit of measurement for a printer's speed is CPS

(characters per second). In consumer-level printers, daisy-wheels typically offer speeds ranging from 10CPS to 90CPS, while dot-matrix ranges from 80CPS to 480CPS.

One advantage of dot-matrix printers compared to daisy-wheels is the ability to print graphic images. Today, most computers support the ability to create pictures of various quality right on the screen and many use icon-based (pictograph) operating systems and user interfaces. Daisy-wheel printers have no way of transferring these images to hard copy. Dot-matrix printers, on the other hand, can simply fire the pins on the print head to correspond to the dots on the screen. Further, because fonts are simply represented as a series of dots, the typeface can often be changed with the flick of a switch or a simple software command. A daisy-wheel printer would require changing the print wheel itself.

Two other technologies are used in the dot-matrix arena other than that of the matrix pins striking an inked ribbon. One is called thermal printing, where the pins actually burn the surface off of chemically treated paper. The drawback to this method is that you can only use thermal paper. The other is called ink-jet because each element in the print head is actually a miniature jet that sprays ink onto the paper. This often provides for smoother characters because the dispersion of the ink tends to fill in the gaps of the letters.

There are factors to take into consideration when choosing a printer, other than print quality and speed. A physical difference is in the type of paper used. Sheet-fed refers to the machine's ability to process individual pieces of paper such as letterhead. For long printouts, a sheet feeder bin would be necessary to prevent the tedium of hand-feeding each sheet. The other type is tractor-feed or pin-feed, which accommodates the classic computer paper with the holes along the edges.

Laser printers are the newest (and most expensive) addition to your printing options. In these devices, a laser beam is controlled so tightly that toner can be literally burned into the paper with extreme accuracy to create high-resolution characters and graphics. The average laser printer costing \$3,000 to \$6,000 has a typical resolution of 300dpi (dots per inch), which is letter-quality to the naked eye.

The resolution of laser printers is far

greater than is found on computer monitors. To reconcile these resolution discrepancies, most laser printers today incorporate a standardized page-description language called Postscript. Rather than employing bit-mapped graphics (print this dot, print this dot, print this dot) that match the screen one for one, letters and graphic images are described as lines and curves.

Postscript offers the advantage of being device- and resolution-independent. The growing trend in desktop publishing, for example, is to use a 300dpi laser printer for proofing a document such as a newsletter. When everything is perfect, the file is taken or sent to a service bureau that has laser printers with even greater resolution that approximates typesetting and photographic quality. These machines are almost exclusively the domain of Linotype; the Linotronic 100 has a resolution of about 1,270dpi and the Linotronic 300 offers an incredible 2,540dpi!

Unfortunately, physically attaching printers to computers is only half the challenge. The computer's operating system or software package itself must know how to talk to the printer in question. To bridge the gap, software modules called printer drivers are often employed to provide the computer with the proper guidelines to talk to each printer. This is the case with the IBM PC family and the Commodore Amiga, for example. On the other hand, the Apple Macintosh is designed to talk primarily to either Postscript devices or its own Imagewriter, which has a dot-matrix resolution of 72dpi that perfectly matches the Mac's 72dpi screen resolution, dot for dot.

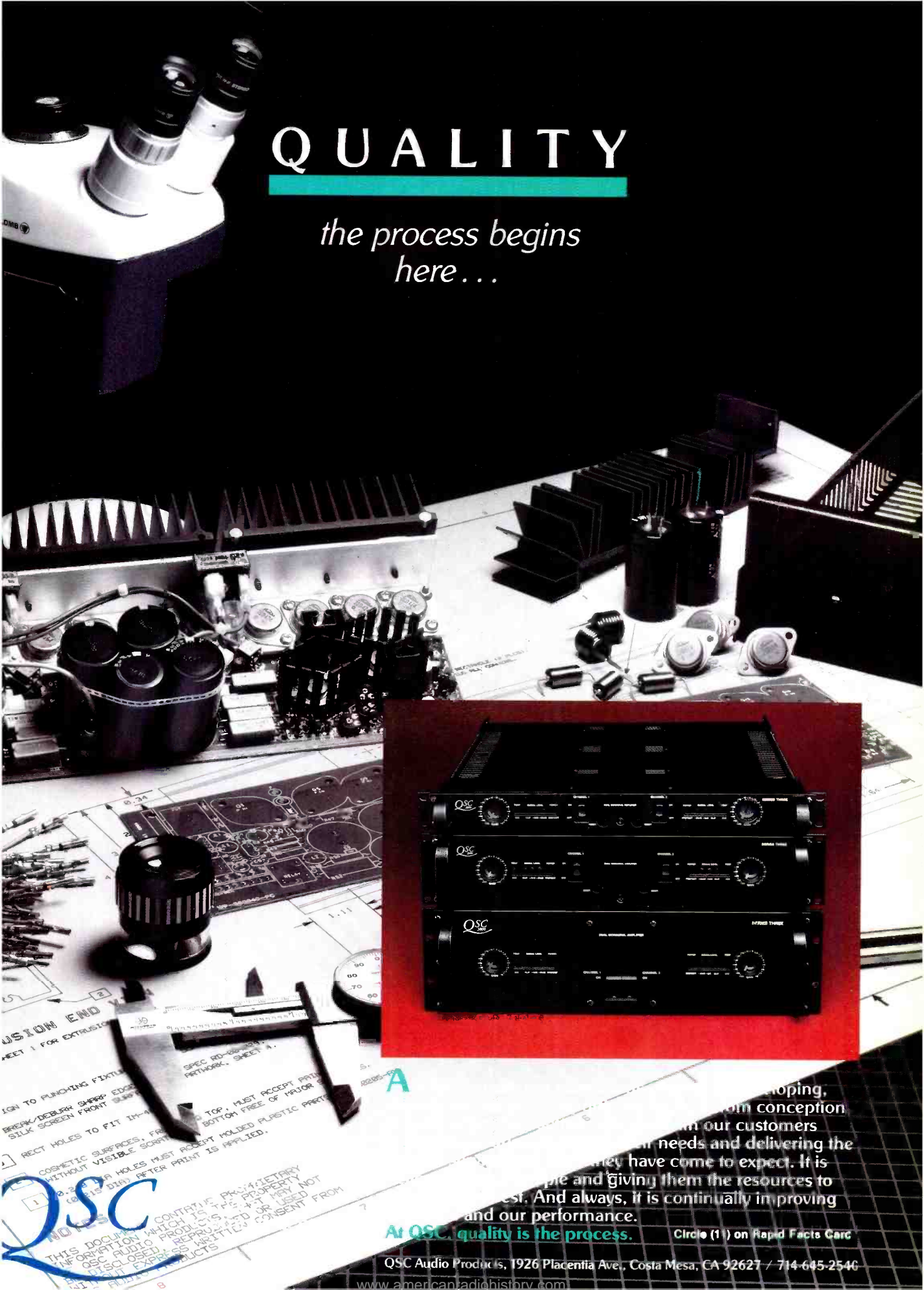
Other software/hardware considerations come into play when using different fonts. To set the stage, different fonts, even ones of the same point size, take up different amounts of space. For example, this article is printed in nine-point Cheltenham. If it were printed in nine-point Helvetica or nine-point Avant Garde, it would come out a different length. To insure that what-you-see-is-what-you-get (WYSIWYG, pronounced "whizzy-wig"), a screen font, along with a matching printer font, is required for the computer's display. In the case of laser printing, the latter is often referred to as a "downloadable" font because a Postscript description of the character set is downloaded (sent) from the computer's disk drive to the printer on demand.

REP

Jeff Burger is RE/P's computer consulting editor and is president of Creative Technologies in Los Angeles.

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Editorial, continued from page 4

Time

Once again, time rears its ugly head in the studio business. It's often the controlling factor in our businesses. We've only got 24 hours, and we can only charge so much for 'em, so let's not waste any of 'em fooling around with mic placement. "Grab a mic and stick it in front of the amp, and let's rock." Sound familiar?

Fortunately, guitar amps can be more forgiving than some sources. If you have years of experience micing amps, drums, strings, brass, woodwinds and percussion, to name a short list, you can probably move fairly quickly and confidently. But if you've come into this biz in the post neo-

sampler era (a.k.a. life after acoustic recording) then there is a good chance you've had limited exposure to all this micing-technique stuff!

Unfortunately, on-the-clock isn't the place to learn these procedures, which means if you don't already have fairly decent micing chops, you had better plan on putting in some serious overtime with your musician friends. This isn't an earn-while-you-learn scenario.

One other thing: Look at the results of Table 8 of *RE/P*'s November "Second Annual Salary Survey" on page 56, and notice how the overwhelming majority of *RE/P* readers learned their trade. On-the-job training. You just can't learn good mic technique out of a book or even at a school. For most, it's a lifelong process of

trial and error, even when applying the basics that have been absorbed and passed along over the years. **RE/P**



Michael Fay
Editor

Managing MIDI, continued from page 10

change even when using *the same* sequencer, if the load on the MIDI line should happen to change—which it does, for example, when you do multiple passes of the same sequence to get different tracks on tape, and you turn some channels on and off.

The solution to the problem of things drifting apart is well known when it comes to tape machines: use one master synchronizer, have it learn the mechanical characteristics of each deck, and let it do its thing. In the software world, there is a similar solution, but only if you're using MIDI clocks and pointers: make sure there is only one source of MIDI timing information—that is, one SMPTE-to-MIDI

converter—for all of your sequencers. Send them all MIDI clocks, and they will hang together just fine.

Make sure there is only one source of MIDI timing information for all of your sequencers.

On the other hand, if you're using MIDI Time Code, and you find yourself having problems, you may have to wait a bit for a solution. As I was writing this (yes, this really does happen), I got a call from the manufacturer of one of these programs

who swears his new version will lock to MTC perfectly, no matter how heavy the load on the MIDI line or the computer. If this is true (and I'll let you know as soon as I get the disk), then he's only really found a solution for himself. But it could help anyone who has to use two MIDI Time Code sequencers at the same time: lock *that* sequencer to MTC, and then have it generate clocks and pointers while it's playing, and lock *everything else* to them.

Of course, then you can't have independent tempo control of the various sequencers. Hey, no one said it was going to be easy. **RE/P**

SPARS On-Line, continued from page 12

ad, but if you've got interesting news they will appreciate hearing from you. Don't forget to ask *what* they are looking for and *how* it should be formatted.

Communications

From the way you answer the phone to your packaging labels, you are creating an image of your business. If you want some help, it's available. The various phone companies can give you tips on the best use of your telephone and the various services and equipment they have to offer. You might be surprised at how inexpensive and extensive the services are.

You will also be surprised at how many

calls it takes to get through to the correct people. But once you make it through, it's worth it. If you want to learn about mailing and shipping methods, ask your business associates which outfit they use and why. Reliability is the most visible evidence that your company is professional. Good communications and prompt deliveries verify the reliability of your staff and your technical systems.

Additional help

Many new businesses can't afford all of the services I have mentioned, but there are a number of free or inexpensive resources. Find one and it will lead to others. Check out the Chamber of Commerce, the Small Business Administration, business programs at the local college, the

U.S. Government Publications Office, trade magazines and textbooks.

And don't forget about SPARS—we have a national network of advisers, offer regular business seminars targeted for success in this industry and have quite a catalog of useful literature and audio cassettes that cover effective business practices. SPARS can be reached at 407-641-6648. **RE/P**

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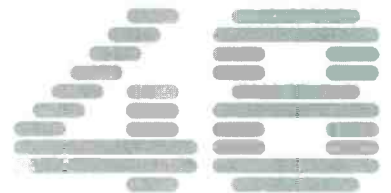


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Technology Trends

By Curtis Chan

The marriage of digital processing technologies and audio, video and control technologies is having a profound effect on the recording industry.

Within the last decade, the recording industry has encountered advancing equipment costs, format wars, tighter budget constraints and ever-evolving trends in facility design and market direction. This, coupled with the escalating sales of "electronic synthesized music workstations" and the proliferation of "project studios," currently has some in the studio industry singing the blues.

However, during the same period, the industry has grown and diversified on many fronts. Digital audio processing technology has created new waves of enthusiasm and applications for the recording, manipulation, reproduction and transmission of digital audio signals. The widespread acceptance of the CD and high-quality cassettes over the past few years by the consumer and industrial markets has smoothed many of the economic peaks and valleys in the recording industry. Diversification into video- and film-related markets has also allowed studios to tap into new profit centers.

For the astute studio owner to stay competitive, future planning may also include discussions on demographic, economic, competitive and technology trends and their impact on the studio's short- and long-range goals. The following guide is intended to stimulate new thoughts and

ideas by looking at the studio business in a different light.

Format wars

Currently, 8mm, 1/4-inch, 1/2-inch, 3/4-inch, 1-inch, 2-inch for audio and at least 15 video formats are currently used in the audio and video industries. Indeed, the plethora of formats is staggering, not to mention the investment needed for compatibility. Add to this the different standards in data formats, control and transmission protocols, and you may not be so envious of the engineer's job. A universal recording media format that meets the needs of the industry would be ideal. The device that would use this format could possibly have the following attributes:

1. High-quality audio and video.
2. Transparent overdubbing (multigeneration recording) capability.
3. One- to four-hour record and play time.
4. Low media cost (environment-protected tape housing for high-density recording).
5. Built-in editing and mixing functions.
6. Low cost.
7. Low power consumption.
8. Movable/portable.
9. Compatibility with present and future formats.
10. High level of reliability and serviceability.

Because of different standards, economics and requirements for each application in each tier of the marketplace, many

tape formats now proliferate because each application requires a different set of attributes from the recording device. In looking at tape machines for mixing vs. field recording, this is obvious. End-users ultimately will have to decide whether to use a single format device for all applications and accept some inevitable compromises in quality and performance or match each application to a format that was designed for that particular need, and perhaps create a cost-effective *interformat* environment.

At least for now, a single universal tape format that meets all requirements worldwide seems impractical. Indeed, during the last decade, the audio industry was introduced to not only new digital audio formats based upon the 1/2-inch and 3/4-inch video tape formats, but also 1/4-inch, 1/2-inch and 1-inch tape widths. The recorders that used these formats tout higher performance, operational and reliability attributes. Similarly, some rotary-head systems showed great promise in decreasing editing and mastering time. But it wasn't until the integration of software-specific solid-state and hard disk devices that the audio industry saw the possibilities of another era in digital audio processing technology and the implications for changes in operational methodologies.

Digital audio workstation

Within the past few years, the digital audio workstation has become an industry buzzword. The workstation integrates the

Curtis Chan is vice president of marketing and product development at Centro Corporation, Salt Lake City. He is also an active member of four engineering standards committees and has helped develop standards and protocols for present and future audio, video and control technologies.

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functions of a variety of hardware into a single system. Gone are the racks of different equipment, interfacing incompatibility, tape and razor blades. The workstation concept attempts to be functionally versatile with the ultimate goal of total transparency to the user, that is, to reach a point that creativity is limited only by the artist's mind.

Unfortunately, technology has a bad habit of lagging behind one's dreams of implementation. An ideal workstation is a studio in a box that performs all of the functions of a sound studio in the digital domain. However, *ideal* doesn't exist at the moment and present workstations are all unique, with differing concepts and implementations.

Manufacturers of these workstations have realized that the potential for profit is in diversifying their product applications and, as an indirect result, the potential for profit for the end-user. But currently, the workstation concept does not pose a threat of rendering analog and digital tape machines and console technologies obsolete. But it does give an indication of and insight into manufacturing design trends, as well as serving as an industry test bed

for future products.

Some examples of current products include New England Digital's system aimed at studio recording, sound sampling and synthesis, video and film post-production, commercial/industrial and radio markets. Fairlight's Series III and MFX are aimed at audio post-production for film, television and radio, as well as sound sampling, recording, editing and production.

Waveframe's AudioFrame is targeted toward commercial and music production, as well as film and video post-production. Digital Audio Research's Soundstation II is aimed at film and video post-production, CD editing, music recording and mastering. AMS's AudioFile was designed for film, television and video post-production, studio recording, CD mastering and industrial/corporate markets.

Lexicon's Opus is targeted toward film and video post-production, CD preparation and commercial productions. The Soundcraft Digitor is a solid-state recorder-editor using a large RAM as the recording medium.

RAM capacity limits recording time, but access to any part of the work is immediate, speeding the editing process.

However, the RAM is volatile and the data must eventually be dumped to another storage medium. The commonalities found in each of these systems are software-intensive computers using RAM and/or hard disk storage mediums with audio production interfaces.

In the short term, we should look forward to more user-friendly interface menus and controls for editing and recording. Likewise, expanded capabilities will be found in the workstation for sampling, music production and composition. Integrating mixing, overdubbing, compression/expansion, time alignment, dynamic processing, virtual waveform synthesis, EQ, editing and sequencing will be a part of the expansion.

In addition, compatibility and expansion of interfaces to the recording, video and film markets will also be a priority. Current examples are: MIDI, SMPTE TC, SMPTE:TC-to-feet/frames and vice versa, RS-422 interfaces and a VITC-to-SMPTE reader for video.

Because digital signal processing technology is still evolving, it is not likely that a studio will go all-digital in the near future as that is still cost-prohibitive. Instead, they will continue to use digital workstations in conjunction with their existing console/multitrack system.

This implies that one major goal will be to develop software and interfaces between the workstation and the console/multitrack system via software control of the console routing scheme and its associated digital routing system.

Audio's rising stars: speed and storage

In predicting what will happen to workstation technology during the next decade, we must first look at trends in processing and storage technologies. By the middle of the next decade, there may be more than 200 memory-device types comprised of standard memory architectures and application-specific architectures.

Many factors contribute to this growing concern. They range from changes in technology to the shifting economics of business. Topping the list is the growing speed disparity between processors and their associated memories because of physical limitations in memory architectures.

Another factor promoting memory diversity is the increasing reluctance of chip makers to provide more processing speed purely with new process technologies because of the increasing costs for new production lines. Alternatives are customization (fitting into new markets and creating new applications), closer cooperation between chip makers (to off-

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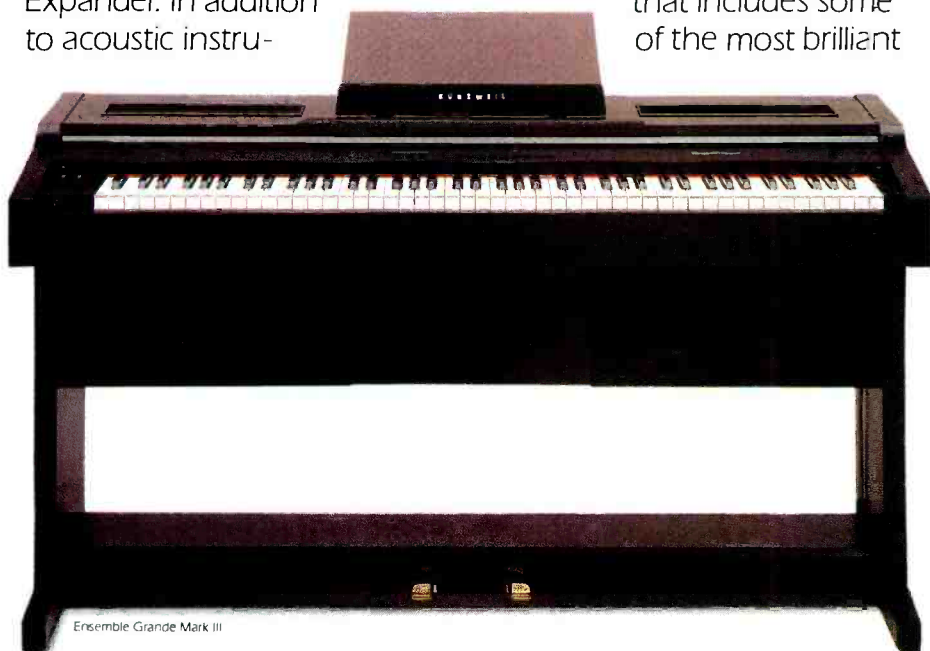
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set foreign competition, increase creative and production resources, and reduce design/manufacturing time) and the shifting of product focus away from cyclical commodity patterns and into specific market niches.

Let us also not forget the advances in hard disk and magneto optical disk technologies. In the coming years, all this adds up to enough new memory types to dazzle and confuse even the seasoned audio professional.

An ideal workstation is a studio in a box that performs all of the functions of a sound studio in a digital domain.

In the processing arena, we should look forward to a new breed of 32-bit processors with speeds from 16MHz to 40MHz and an addressing appetite well into the gigabyte range. Similarly, Dynamic RAM (DRAM) geometries have gone from 4Kbit in 1975 to 1Mbit in 1988 to 16Mbit in the early 1990s and 64Mbit by 1995.

The magnetic disk drive will also be an attractive medium for the audio manufacturers because of its combination of speed, capacity and cost. In 1980, a megabyte of disk memory cost \$185, and the density was 1.08Mbits/in². Today, a megabyte costs \$6.30 and storage density has gone up to 22.42Mbits/in². Current drive capacities range from 10Mbytes to 2.8Gbytes. By 1993, it is likely that magnetic memory will sell for \$1.75 per megabyte and access time will come down from 20ms to 10ms.

In comparison, today's main system memory costs \$250 per megabyte with access speeds between 120ms and 150ms. By 1995, projected costs will plummet to \$30 per megabyte, with access speeds under 25ns. Cache (fast, assignable, temporary memory that emulates a disk drive) memory will also go from \$500 per megabyte in 1987 to around \$60 per megabyte in 1995, while access speed drops from 45ns-55ns to 15ns-30ns.

The last contender is optical disks, which offer large storage densities per unit cost. Cost per megabyte of write-once, read-many (WORM) disks in 1987 was \$3.50 to \$5.50, with access speeds of 35ms to 100ms. This is expected to drop to less than 50 cents in 1995, with speeds down in the 20ms to 25ms range.

In a similar vein, erasable magneto-optical disk drives are finally becoming a reality. By 1989, such companies as Sony, Olympus Optical, Hitachi, Laser Magnetic

Storage, Matsushita, Optotech, Toshiba and Sharp will join the growing list of players in this new, lucrative market. Maxtor Corporation in San Jose, CA, plans to roll out a 5.25-inch magneto-optic disk drive called the Tahiti I, with 1Gbyte of storage, average access times of 43.5ms and transfer rates of 13.7Mbits/s for \$2,500 in OEM quantities.

Also offered will be a 3.5-inch drive codeveloped by Maxtor and Seiko Epson Corporation of Tokyo, with a 160Mbyte capacity, 100ms average access time and 2Mbits/s transfer rate for \$1,000 in OEM quantities. If this isn't enough to entice the audio manufacturers to consider this medium for storage seriously, then the clincher will be that end-user costs for a 1Gbyte erasable optical disk will be around \$150 and the 160Mbyte version will only be about \$25.

Last but not least is the possible use of a device called a "Floptical Disk Drive" for mass storage. Designed by Insite Peripherals Incorporated, this concept bridges the gap between magnetic and optical technologies by using optical disk technology for head positioning and magnetic media for storage. The result is 20Mbytes on a 3.5-inch disk and drives targeted for \$250 in OEM quantities.

You can bet that astute audio manufacturers will seriously consider implementing magneto-optical disk drive technology into their workstation concepts in the near future. Meanwhile, we should look forward to further developments and cost savings in solid-state and magnetic storage media.

Tapeless studios

Taking the implications one step further, the future audio workstation will consist of little more than a computer keyboard, mouse, monitors and a multifunction console. These workstations will be ideally suited for integration into the large control room environment, which will also include a main mixing console, audio and video monitoring, and some sort of acoustic space in which to record a live performance or sample for further processing.

As processing power and memory storage increase, the ability of the computer to process repetitive tasks in the background also increases, leaving the operator more time to create. The future workstation will record sounds in the form of samples. Because of future storage capacities in magnetic and optical media, the length of the sample will also be increased to a point that a 5-minute vocal track recording on tape will be the same as a 5-minute recording done on a sampler.

The sounds can then be stored in a

library, sequenced and played by keyboards, drum pads or other MIDI instruments. The station can also emulate a console/tape machine with the added benefit of total recall. In addition, editing will encompass adjustments of EQ, level, panning and effects on any track, with cut and paste capabilities for individual sounds and passages. This implies that mixing will be an inherent part of the recording process and is done simultaneously with the recording. The indirect benefits will be more favorable record company budgets for recording and mixing, and longer booking periods for the automated console room and digital workstation studio.

Future trends

The marriage of digital processing technologies and audio, video and control technologies is having a profound effect on the recording industry. The evolving attitudes toward room environments as well as the impact of business economics have also fanned the flames of change. The following predictions are food for thought in forecasting the future of the recording studio.

The industry is decentralizing; that is, while the elite large studios are stretching their lead, the mid to low-end studios will continue to struggle to find market niches for their capabilities. As more and more studios are bought out by commercial artists, producers and investors, an equal number of small independent studios will open up in the jingle and music publication arena. Similarly, a growing number of major studios are investing in digital audio technology to promote growth and diversification.

Aside from the studio's main business, many have integrated digital audio technologies with their existing operations

A growing number of major studios are investing in digital audio technology to promote growth and diversification.

to offer audio-for-video services such as off-line audio assembly, sweetening, audio post and layback. Others offer editing and mastering services for CD and R-DAT production. Indeed, one may think that the recession hitting the studio business today may be a hidden opportunity in disguise.

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expanding an existing facility (just to keep up with the equipment race) is an increasing possibility. The ever-evolving synthesizer/sampler/sequencer combination has proved that. Musical instrument companies such as Ensoniq, E-Mu Systems, Akai, Roland, Yamaha, Kurzweil and Korg have developed effective sampling equipment along with their line of synthesizers. Additionally, the integration of magnetic/optical storage with RAM to complement increased processing speeds will add more functionality, speed and flexibility to the digital audio workstation concept. Sound quality will also be increased as a result of advancing technology.

Production control rooms

The future production control room will continue to get larger, while monitoring becomes smaller in physical size. The production control room of the future will have enough space for the engineer and console/workstation, signal processing equipment, producer(s), musician's workstation, clients and production staff. Each person or group of people actively engaged in the project will have individual audio and video monitoring, communications and timing systems, computer ter-

minimal, desktop work space and direct eye-to-eye contact with the other key production personnel. A hybrid monitoring scheme incorporating subwoofer(s) and multiple close-field monitors may make the future production control room possible.

Standardization and its impact on the industry are the key issues. Although many formats proliferate, great strides are taking place among the manufacturers to negotiate towards future compatibility of formats and protocols. The benefits to the end-user and manufacturing markets would be stunning, as would be the outgrowth of products. The additional benefits of reliability, intelligent setup, minimization of interfaces and communication compatibility would also result. However, in the interim period before we reach this technological nirvana, there will be a need for studio management to begin educating the technical staff, with an emphasis on systems engineering. This will include the design and maintenance for all system communications between rooms. Such tasks as maintaining electronic patching and routing, MIDI patching, audio, video, control and systems communications will

become another engineering responsibility.

Conclusions

The merging of technologies brings with it the implications and possibilities of the all digital audio production studio. The audio industry has seen great change within the last decade and is now at the forefront of integrating new and emerging technologies.

The change in operating methodologies based upon the workstation concept will lay the foundation from which a new level of user-friendly interfaces will be developed, and the subsequent job scope of the specialist will evolve into that of a generalist.

Despite short-term uncertainties, the future looks bright for most of the recording industry. The proviso is that facility owners remain adaptable, resourceful and use good judgment when evaluating the direction and purchase decisions of their companies.

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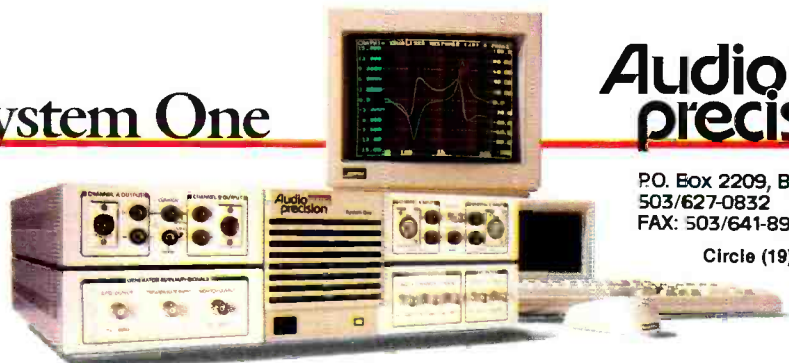
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Employment Trends

By William Moylan

Here's what one instructor of university-level "Sound Recording Technology" courses tells his students about future employment trends in pro audio.

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In the best of all possible worlds, how you make a living should intersect a *preferred* occupation with the *reality* of everyday living. For many people, careers in audio seem appealing, rewarding and enjoyable. The perception is that there are more people wanting to hold positions than there are available positions. This is not entirely accurate, especially for those attempting to enter the industry.

Pro audio is constantly changing. The economy, public taste/opinion and technology are the major catalysts. This constant state of flux increasingly complicates attempts to get an accurate picture of the job market. Areas of possible employment are directly related to the constantly changing make-up of the professional audio industry.

Today, a market exists for computer-literate individuals (in fact, long-term employment without some computer knowledge is not likely). To a prospective employer, this skill would have seemed a peripheral curiosity and unimportant to the person's primary job functions just five

years ago. (Remember, MIDI appeared in the fall of 1983.)

Estimates indicate that the U.S. audio industry and its related fields employ several hundred thousand people. Very few of these people have "glamour" jobs producing, tracking or mixing big-name pop artists. In fact, many pro audio positions have no direct connection to the creation or performance of music. While music and the associated mystique of the popular music industry attracts many people to the audio field, many other avenues are available. The industry in the late '80s is broad and offers a wealth of career and employment opportunities. Each segment of the business has its own potential positions and each will have a different future. The primary audio career areas are listed in Table 1.

Where are the jobs?

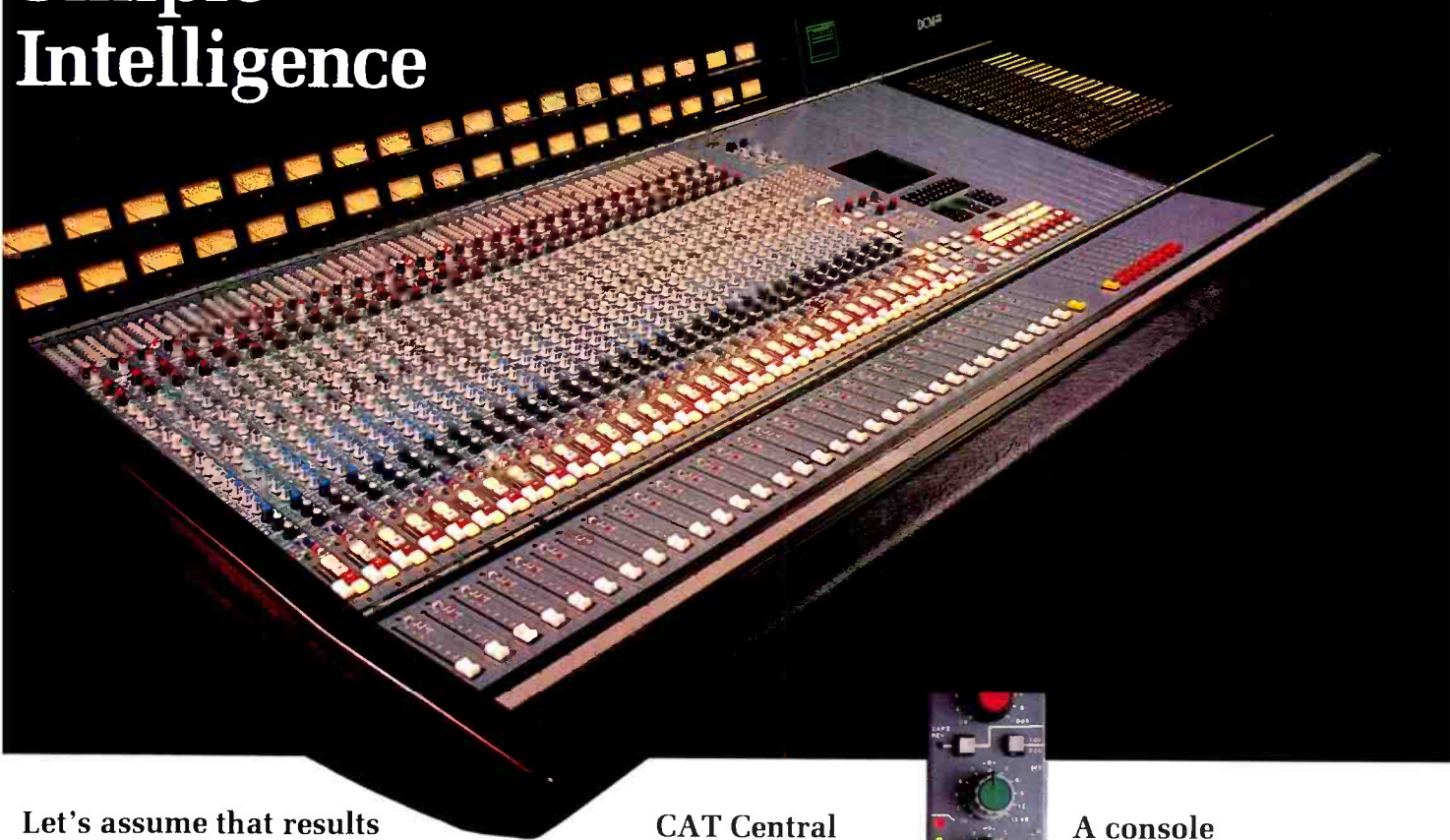
In the audio industry, the areas with the highest number of employment opportunities have always been closely aligned with the newest technology, production technique or public craze. Today's market is no different, with the areas of influence being MIDI, digital signal processing, stereo television and music videos.

MIDI and computer-related technologies are causing changes throughout the industry. These changes bring with them new jobs, and the redefining of old positions/companies.

Recording studios are experiencing a

Dr. William Moylan is the director of the sound recording technology program at the University of Lowell, Lowell, MA.

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Let's assume that results are what's important, not which tools you use.

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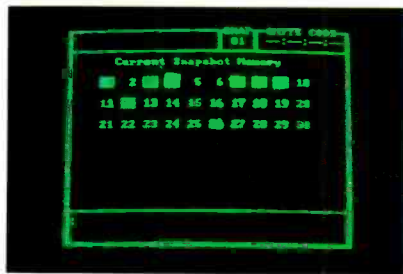
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Table 1. Listing of primary job areas in the professional audio industry.

- Recording studios
 - * Manufacturing
 - * Pro audio equipment supply and sales
 - * Audio-related software development
 - * Programmer/synthesist
 - * Broadcast:
 - Television (network and cable)
 - Radio (AM and FM)
 - * Audio for video post-production
 - Film sound
 - Sound reinforcement
 - Music: club, theater, open-air
 - Auditorium/stadium
 - Equipment rental
 - Consumer audio equipment
 - Sales/service/system design
 - Tape duplication
 - * Sales and rentals of semi-pro sound reinforcement and amplification equipment and electronic musical instruments
 - Recording manufacturing
 - Mastering and manufacturing of compact disc and vinyl LP
 - Sound and system design
 - Sound system/equipment installation
 - Equipment repair and maintenance
 - Corporate/industrial
 - Recording company
 - Peripheral industries
 - Telephone
 - Local cable television
 - * Advertising companies and corporations with media centers
 - Audio in science and medicine
 - Acoustician and noise control
 - Etc.
- * Areas showing strongest promise of employment growth

change in their markets, and they must react accordingly. The home, or project, studio is being used by many people for much of the "tracking" business that used to take place at studios. While the big studios are not losing as much business from this source, they have had to acquire MIDI computer and sound synthesis equipment to allow these people to bring their projects directly into the studio (often on floppy disk). The major studios have had to address staffing needs to cover the new technology; some have installed new rooms with new engineering staff, others have merely added the new instruments to the existing control room(s)/studio(s) and expect existing engineers to re-educate themselves.

Projections are that mid-level studios will have increasing difficulty maintaining profitable business, and thus will probably offer little in the way of new growth-related positions.

The major studios will continue to have openings for interns/apprentices and, occasionally, a first engineer (with an established reputation and client list). More and more, they will seek to hire *programmer/synthesists* to assist on projects or to be permanent staff members. However, good people will not always be able

to find "the right studio at the right time." Instead, these people may have to look to different (but, hopefully, equally rewarding) portions of the industry.

The *project/MIDI studio* is also replacing the low-end commercial studio. While listings of 8- and 16-track studios abound, most of these studios are now personal rehearsal studios that see very little outside business. Don't look to the small studio for employment. Chances are it is a one-person operation that often barely covers operating expenses.

Relatively low-cost MIDI-based systems, which allow an artist to accomplish more preproduction work before going into the recording studio, is also making available low-cost audio production for *advertising and corporate industries*. Many of these companies and agencies are establishing their own facilities, and are searching for staff to produce in-house materials and some public relations and advertising materials, with major items still produced in the more elaborate professional studios. This job market is just opening up and shows a good trend towards future employment opportunities. This concept has come hand in hand with the desktop publishing trend for small-circulation print media. It should soon be obvious (if it's not

already) that simply because one has the requisite equipment does not mean one has the staff to turn out a desirable product.

Sound reinforcement professions are among the sound engineering careers that seem to be growing. More opportunities exist for music engineering-type positions in sound reinforcement (including remote recording), especially working with more well-known and established artists. A wide variety of SR applications outside of music make this a very large and often overlooked aspect of the pro audio industry. Employment prospects are excellent for the entry-level person equipped with a knowledge of today's technology, particularly MIDI-applications in live performance.

MIDI-based systems and the proliferation of project studios has helped to create healthy *pro audio equipment supply and sales*. The new market of smaller studios and individuals has emerged to create a generally strong and consistent market for low- and mid-priced equipment. Sales of some high-end equipment have not been as strong as in recent years (generally attributed to the October 1987 stock market slip), but as a whole, the sales portion of the industry is healthy. Employment opportunities abound in this area. Knowledgeable people are always in demand. A good number of companies are engaged in *equipment rental* in addition to sales. These companies often seek help that can function as production engineers when needed. Related is a consistently high demand for sales in semi-pro audio equipment (and high-fidelity home systems).

Manufacturers of pro audio equipment are responding to the interest in MIDI-based sound generators, signal processors, mixers, synchronizing capabilities (with tape and with video), as well as high-end digital recording, mixing, sampling and signal processing. Audio-related software developers are exploring new ways to use the potential of the devices. These two areas of the industry are changing quickly; certain areas are growing rapidly, and others are being phased out. Generally, in this area, employment prospects are good for the right person. Music (MIDI) and audio-related software development is a relatively new field still looking for qualified individuals. Whether a person is an expert at digital signal processing, a hacker, a programmer/synthesist, an experienced mixing engineer, or a recent graduate, this portion of the industry can provide one with a meaningful work experience and a promising future.

The *broadcast* industries are major components of pro audio, holding a wide variety of production and engineering positions. The TV industries are particularly

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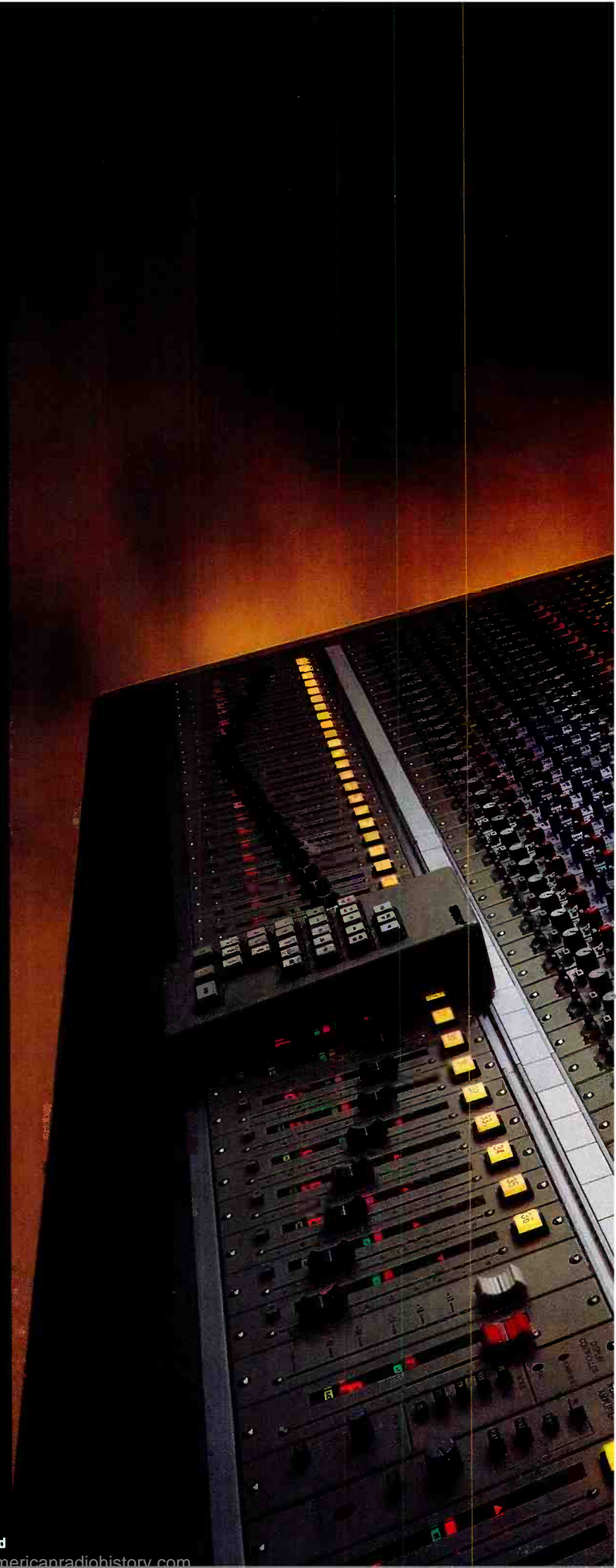
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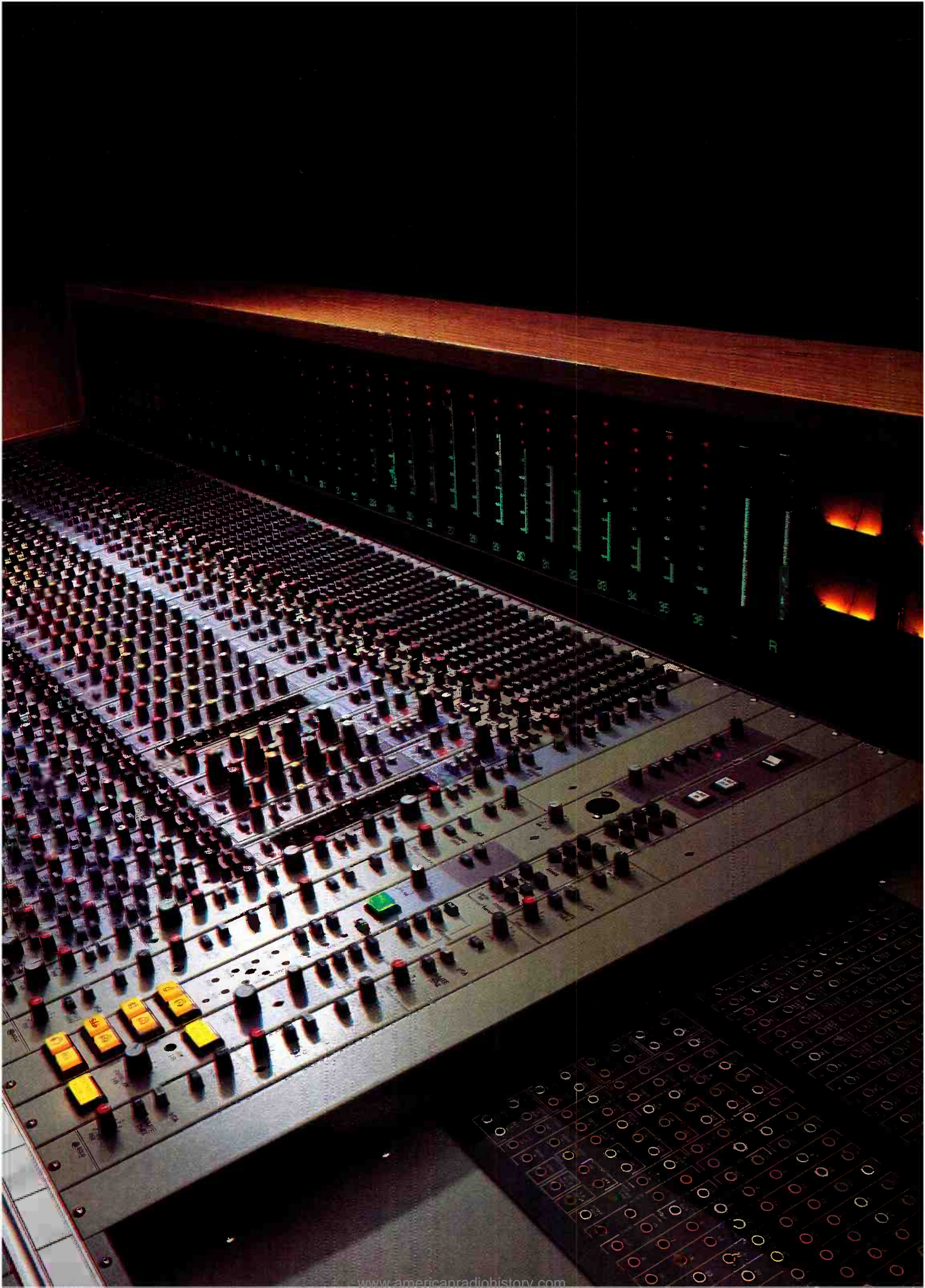
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Methodology

By William Moylan

To my knowledge, no publication or organization is actively compiling the extensive hard data needed to predict the future in professional audio, and thus employment trends, accurately and easily. The information and predictions presented are the result of a wide variety of sources: conversations with industry analysts and colleagues; membership and convention attendance data available from audio-related professional societies (AES, ASA, SMPTE, NAB); industry analyses and reports from current professional audio publications; numerous conversations with owners and managers of professional studios and facilities, especially in relation to internship opportunities.

The methodology for predicting future career options must accept constant technology and market changes as givens. Organizations and individuals will look to an evolving set of worker qualifications to address these changes, however, they have relied, and will continue to rely, on certain fundamental skills and knowledge areas for their employees. New positions occur either because of expansion of a business/facility or the replacement of a previous position. Most often this will reflect a change within the facility or an alteration to keep pace with technology.

The world of professional audio is much broader than many people appreciate. As a director of a major audio-related university program, I often have conversations about career options with parents, incoming students and, most importantly, graduating seniors looking for an internship location or employment.

I encourage a thorough exploration of career opportunities in all facets of the pro-audio industry, including the premise that the skills and knowledge required to function in the pro world are applicable to a wide variety of career paths in the commercial world, and other audio areas, as well as in support industries.

This is not a way of making a poor employment situation look better; this a realistic approach for young people that want to become a part of an industry that glorifies a few "superstars," while exploiting many qualified and hard-working individuals. Many people are and will be actively engaged in the more desirable production roles, but there is room for a multitude of people in other related, and equally rewarding positions.

open to new people possessing needed skills. New TV channels are being devised specifically for cable, and they often have higher standards for audio quality and integrity. The cable TV movement has happened concurrently with the adoption of a standard for stereo television. This new field holds much promise for additional employment opportunities over at least the next five years.

Stereo sound for existing stations will mean a substantial revamping of production equipment and techniques, and will certainly be accompanied by new staff positions in audio. The speed at which this change will take place is difficult to predict. Initial predictions were that a fast and dramatic change would take place. This has not happened, but the changes are inevitable. Prospects are very

favorable for careers at network and cable TV production organizations as this happens.

AM and FM radio stations offer substantial employment opportunities. In fact, radio is nearly entirely audio-related. Most local markets are seeing substantial improvements in the fidelity (with certain stations broadcasting exclusively off compact disc) and increased program offerings and sophistication (in some markets). Employment prospects vary widely by regions. Generally, this area has only moderate staff turnover. But given the large number of positions in the industry, employment prospects are consistently high. Radio attracts a large audience and is a major industry.

While music videos have had a strong (albeit, so far, short-lived) impact on cable

TV ratings, they have had a stronger and longer-lasting impact on *audio-for-video post-production* facilities. Many facilities are dedicated to A/V post, and many major studios have added video post suites or capabilities to their facilities. While music videos may not be the driving financial force to current development in A/V post, they have focused creative attention to the link between audio and video. While this link is most visible in cable television, it is having widespread impact in network and commercial TV markets, the film industry, and now the MIDI studio (with consumer-quality video) has striking capabilities. Commercial facilities presently have openings for audio people with a knowledge of video production and synchronization problems and techniques.

This area will see continued growth in employment opportunities, both in numbers and in varieties of positions; the amounts could be moderate to substantial over the next five years, but are dependent upon the technology's ability to address a number of practical areas adequately. As a society we are learning to expect good-quality visual and aural product simultaneously. It is likely that the creative link between audio and video will continue to be strengthened.

There exists a myriad of additional employment opportunities to be extracted from the areas listed. These areas are not growing significantly, but they are stable and are a regular source of job vacancies. Most of these positions are not engineering careers. It is worthy to note that there are more pro audio careers that do not include engineering and mixing than careers that do. New job functions in these categories are also most likely to be influenced by computer-oriented technologies and by changes in the media.

Make your own job

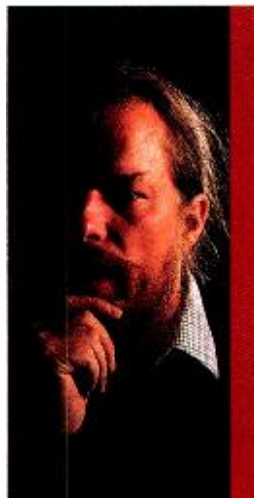
"Employment" implies that a person is working for a particular employer, a single company. In the world of professional audio, this is not always the case. In fact, a substantial number of persons engaged in professional audio are, in whole or part, self-employed.

Self-employed audio professionals often free-lance in a wide variety of job functions. The list of various functions is as long as one can imagine, but some of the most common are:

- Studio owner.
- Production engineer.
- Design engineer.
- Live concert sound engineer.
- Producer.
- Arranger/composer.
- Author.
- Consultant.
- Programmer/synthesist.

Sound Thoughts on Live Performance

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“The general public’s sophistication keeps growing. Soon, if we have our way, the audience will demand the same accuracy in live performance that they get from home recordings.”

Instead of second-guessing the tastes of the market, Meyer produces sound systems that most truly represent the character of the signal they receive, leaving artistic control where it belongs—with the artists and sound designers.

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Every part of every component undergoes rigorous, comprehensive testing. Meyer Sound controls all aspects of the system design—if not by manufacturing, then by modification and refinement to Meyer’s stringent standards.

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Meyer originally intended to be solely a manufacturer of high-quality, rugged and reliable loudspeakers, expecting others to pioneer and perfect testing equipment. But the need to accurately measure the performance of Meyer components individually and in arrays outgrew the quality and resolution limitations of available testing equipment.

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John Meyer’s involvement in loudspeaker design began in 1967 when, as a technician for a Berkeley, California Hi-Fi supplier, he set out to discover why a leading manufacturer’s drivers kept tearing themselves to pieces. Further investigations convinced him that the market sorely needed a class of rugged professional speakers that would maintain their characteristics over time.

Research in Switzerland in the early seventies secured his knowledge base. In 1972, Meyer developed the JM3 all horn loaded tri-amp system with rigging, which was the standard for Broadway shows until the introduction of the UPA in 1980. From 1973 to 1979, Meyer sought out the best available parts and designed the first Ultra Series™ reinforcement speakers. In the decade since, John Meyer has established Meyer Sound Laboratories at the forefront of professional reinforcement technology.

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The future

When speaking of available entry-level positions or of the realistic expectations for a graduate of an audio-related, four-year university program, one must be careful to keep in mind the diversity of the industry. For a well-prepared individual willing to relocate, willing to work for an entry-level salary, and for an individual with flexible employment expectations, employment prospects are quite good now.

Barring another stock market crash or an unforeseen major breakthrough in technology, this condition should not radically change over the next 12 to 24 months (although some people are concerned about the effects the presidential election will have on the economy). A qualified individual willing to look for and take what is available in a given locale can make a living in the audio industry. Given suitable "on-the-job" experience, this person should be able to make a more-or-less comfortable middle-income wage.

Is a state-of-the-art music studio waiting to put everyone coming out of a university program into a first engineer position? I think not. (Nor do I think we should expect them to.) The pro audio industry attracts many qualified and unqualified people willing to work at certain jobs for next to no money.

The "glamour" positions, and many of the more creative positions, do not pay well (save for a few "name" people). Like musicians, music engineers are underpaid for tasks that appear to be *enjoyable*. These positions are very popular, but are demanding. These are the creative positions that many very talented people pursue because they feel they must. If one wishes to pursue this avenue, the most direct approach seems to be a four-year university program and an apprenticeship at a suitable studio; ideally the apprenticeship should be a long-term agreement between the individual and the studio.

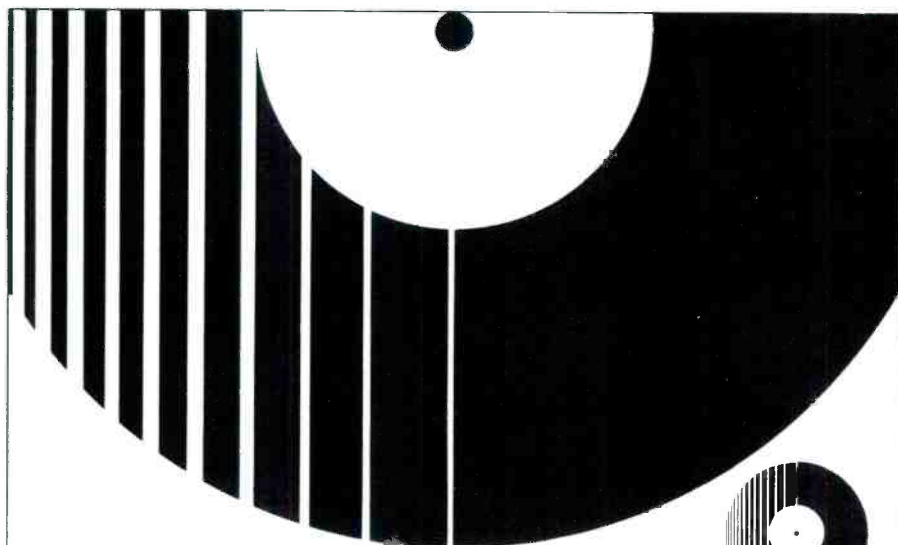
Over the next five years, the outlook for pro audio is essentially positive. We have become a vital component of contemporary society. The pro audio industry provides much of the entertainment people deem desirable (music, video, television, radio), and necessary (communications

and media). The services of a wide variety of audio professionals will certainly be needed into the next century. Any problems concerning the number of positions and new jobs will center around technology changes.

Are too many people looking for too few jobs? This is probably true for the more glamorous positions, but *not* for the industry as a whole. Jobs are available for those who have the insight to identify where they are and possess the qualifications to attract the job offer.

Too often overlooked is the fact that professionals already in the pro audio industry must remain qualified, too. A very real danger exists to those employed in an area that is dependent on technology, and that often finds itself reacting to a new technology. One can quickly find oneself unprepared to handle a job function. Going into the next century, audio professionals must be prepared to re-educate themselves to be on top of the *next* new technology. In this business, job security is primarily based on the quality and results of the last "performance," not on history.

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A Five-Year Look into the Crystal Ball

By Jeff Burger

★



Five experienced professionals share their thoughts on what the next five years hold.

As Father Time turns the page on yet another year of history, we often become reflective and analytical about the future. Life in the late 20th century is evolving at a dizzying pace and the microcosm we call *pro audio* is no exception. The way in which we perform our most fundamental daily tasks is being altered by major factors such as technology, the economy and consumer market trends. As equipment increases in complexity and expense, and the competition for studio time proliferates, the very nature of remaining profitable—indeed, staying in business—needs to be analyzed by even the most seasoned pros. Where is that crystal ball when you need it?!

Perhaps the next-best way to take the pulse on future trends is to tap into some

of the industry's best minds. To that end, *RE/P* asked five seasoned pros to share their thoughts on what the next five years hold, from their unique vantage points: a studio designer, a producer, an artist, a studio owner and an engineer. As you might expect, some views were echoed across the forum while others espoused conflicting theories. Regardless, we think you'll find the results interesting and informative!

George Augsperger, studio designer

I think we are just beginning to feel the effects of the computer age technology in the music and recording industry. The overall trend can be summed up as a period of synthesis and integration. There's going to be a blurring of definitions. In studio design and architecture, we have seen the gradual evolving of what

started out as a control booth, to a control room, to a mixdown room, to a post-production room. What we're really starting to design now are *production* rooms. What used to be a control room is now a large room, maybe 25'x30', which just happens to have facilities for recording and the control of sounds, but also has space and facilities for keyboards, drum pads, synthesizer and various processors.

It means that the room is really a combination of production and processing space. Three things will impact the room design. First, I think the days of the 15-foot-wide discrete-input console are numbered. I think we're finally going to see a trend toward a virtual console. This extra 60 square feet is going to be replaced by performance areas. This year, we're exactly 30 years behind the stage-lighting industry. Today, a stage-lighting console is an Apple computer!

Jeff Burger is *RE/P*'s computer consulting editor and president of Creative Technologies in Los Angeles.



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Secondly, with the proliferation of these electronic sound sources in the room, one thing that has returned to haunt us is miles of cable—control rooms are starting to look like telephone switchboards again. Hopefully, sometime in the next five years, fiber optics will come to the rescue and we'll start seeing some simplification of interconnection. Instead of needing 64 XLR connectors, you would have one multiconnector that handles maybe 512 channels of audio information.

The third thing to come is the development of active acoustics. People have tiptoed around this in performance spaces and concert halls, but not in the smaller rooms. With the computer intelligence and signal processing that's going to be available, that time has come. It will be mainly the ability to control room acoustics without wasting a lot of real estate. Why should I waste 4 feet in the back of the room for a bass trap? As Paul Klipsh says, you can't design a miniature 64-foot wavelength. But you sure can design a bank of something like loudspeakers that are being controlled in such a way that they take the place of the bass trap. Passive-type diffusers take up valuable real estate—let's make an active diffuser. Instead of relying on passive reflective and absorptive surfaces to alter the normal resonances of a room, let's do it with amplifiers and loudspeakers.

More and more, we're going to see the integration or blurring of the definition between the recording session and the performance session. What I see on the horizon are some great strides in real-time signal processing, made popular by cur-

"Instead of relying on passive reflective and absorptive surfaces to alter the normal resonances of a room, let's do it with amplifiers and loudspeakers."—George Augsperger

rent computer technology at affordable prices. You'll also see this in concert sound and not just the big shows. Churches want to know, "How do we pick up the choir and make this assembly of 15 people sound like a Hollywood chorus?" Now the trend is to "fix it in the mix," but in 10 years we'll be able to do it in real time.

In concert sound technology, one of the first things that will happen is that we won't have to worry about feedback anymore. It will be automatically

processed out before it ever gets to the loudspeakers. The same thing happens with the pop singer—we want this guy to be a star; unfortunately he can't sing! Well, who do we want him to sound like—a cross between Presley and Sammy Davis? We'll dial it in and see if we like it!

I'll go out on a limb and say that we're going to see the rebirth of multichannel for home systems. We're already starting to see what are, in effect, surround decoders for videos that happen to be encoded with the Dolby format for theater use. With the proliferation of electronics, at very modest prices, the concept of having four loudspeakers or two mains and four subsidiary loudspeakers in a typical home or auto environment is valid. Right now, everybody's just tiptoeing, but with more standardization, we'll see more use of multichannel sound.

**Patrick O'Hearn,
self-produced recording artist**

I think that there will definitely be more progress made in the state-of-the-art of project/home recording studio. The bigger studios will probably continue to do an extraordinary amount of business, getting bigger as they move into film music. It seems that the whole middle-class of studios is evaporating.

The small studio in the bedroom or the garage will continue to refine its ability to produce first-rate product, using rental equipment—sort of a hybrid between the MIDI studio and the small local studio. This will allow artists or producers to work at home, in a MIDI environment, with keyboards, samplers and the like (as well as a certain amount of live tracking), and rent an inexpensive studio for acoustic recording. Then they can take the tapes and a second machine home and bounce back and forth.

There's a movement toward higher-tech home recording. A lot of people are renting multitracks and buying bigger, more sophisticated consoles. You have to book weeks in advance now to rent digital multitracks. The major studios that haven't made the investment in digital are renting them when their clients wish. The cartage companies are always eager to share stories of the impossible places they've moved these mega-digital machines. That is a trend that's going to continue.

Signal processing has gone down so much in price that you can set yourself up pretty well to record anywhere. Some companies are now specializing in outboard gear rental. There's a studio in Chatsworth, CA, called Smoketree that rents their "Mega-Monster" rack, containing about 12 of the most-requested pieces of high-end studio outboard gear, for what

most rental companies used to charge for a single piece. And, they deliver! The only thing that's really stopping people from mixing at home is a functional console with some form of automation.

The jingle industry has gone from about 10% done in home 8-track studios and 90% being done in commercial establishments to the complete reversal of that. Most of the production work is done by one or two people. A lot of inexpensive film music is done at home...come to think of it, a lot of expensive film music is done at home too! Pop and rock 'n' roll records aren't generally made at home, so there's always going to be business for studios with a good-sounding live room!

**Chris Stone,
studio owner**

To remain profitable today, a major studio almost has to be in the production business, as well as the studio business. For example, the average record today needs a lacquer master, a CD master, an F1 archive copy and a DAT master for foreign record production. In the studio business, it's dog-eat-dog, cutthroat prices, whereas in the production side, the prices have stayed fairly standard.

The old "diversify or die" axiom is also important to profitability because the visual business is still more profitable than the record business. You can get a really decent 24-track studio today for \$125 an hour, sometimes less. The cost of replacing that equipment and depreciating it on a straight-line basis, and the cost of operations are almost equal to that \$125/hr rate. In the music-for-picture area of the business, the nature of the equipment is much more complex and the return on investment becomes very important.

Film scoring is an example. Orchestras are coming back. The synthesized scores we've seen for the past three or four years, which only required a small room, I see going away.

I'm finding I can get more into film post-production for such things as ADR and electronic Foley. Why? Because I'm a sound person. I've dealt in sound and acoustics all my professional life, whereas the film industry, in general, has always looked at music as being less important than dialogue and picture. Music, which five or six years ago was an unfortunate necessity, has risen to the forefront with all the soundtrack albums. We've had a successful crossover business from records to film and, at the same time, we're almost being forced back into the mastering and production business because that's one more place we can prospect because there's still a significant amount of profit to be made.



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We have to realize that black vinyl is almost dead. The vice president of music for Tri-Star told me that Tri-Star makes movies because they want to sell videocassettes. That means a lot! That means digital sound, because digital, like video cassettes, is something you can sell to the consumer. It means you're doing your sound for a whole different purpose. I don't have to look at the digital investment as an audio-only format; I can project to the large film and video markets that the digital product will eventually reach. Three-fourths of our digital rentals go out for visual projects, not for records. The visual guys know the value of digital. They recognize the merit in uplinking a movie with digital audio and transmitting it, via satellite, into our homes with the same digital fidelity as the original production mix.

Another area that production-oriented studios can get into is restoration of old masters and soundtracks: change the EQ curves and take out the noise. I think the colorization of films is bad, but cleaning up old scratchy soundtracks (that were done on silver nitrate) and making them sound much clearer doesn't destroy their original integrity.

We also find more and more profit in the rental area. We're just in the process of committing to digital 48-track machines. Very few facilities will own them because they cost about \$185,000 apiece. There is profit in the rental business, and we don't mind talking about it because every facility has a choice: rent or purchase the machines.

I don't think a multiple-studio operation can be single-faceted. If you want to be in the record business alone and do rock 'n' roll, you'd better have a one-room operation, have your equipment paid for and be the engineer—because you're going to have to compete on that level.

I really think the industry is changing as a whole. The impact is coming from so many different areas that we all have to look at the big picture and decide what areas of the market we're going to follow to be profitable. I don't think you can do just a single thing. I think you have to look at your skills, look at what you want to do and look at your market, and be prepared to change when they don't work. You have to maintain your flexibility so that you can move with the market. You have to invest in the areas that you see as upward trends.

**George Massenburg,
engineer/producer, studio
owner, manufacturer**

I don't see a heck of a lot changing in five years. The architecture for the next

generation of signal processing is on the horizon, but it's not here. I don't think it'll get here for another three to five years, and it won't be fully integrated before another seven to 10 years. At the same pace, we'll see Winchester and optical drives dropping in price to a point of being competitive enough to enter the library market. I don't see a lot of change until the price of rotating memory comes down. The audio industry is so small that we're not going to motivate price reductions on our own. We're waiting for the personal computer industry (to use enough optical disks) and the government (for digital processing chips).

None of the digital audio workstations address a *general* need yet *and* they're just too damned expensive. We need an agreement between manufacturers on an automation standard like the de facto CMX edit decision list standard in video. We have the ES-Bus for machine control and the AES/EBU as a two-channel digital interchange standard—those are beginnings. There is, of course, still great debate over when digital is working right and when digital is sounding wrong. I see more penetration coming from the other end, like the Yamaha DMP-7. The only problem there is fidelity.

I hate the way records are made today. All these machines are supposed to be our salvation, but they don't make *better music*. They just make more confusion. Most of the MIDI studios are not turning out wonderful music that touches people; it's just crap. Now, I use it all, but I like to think that we can still make records that have a sense of themselves, a sense of time and a sense of place—records that are artistically executed and entertaining. We're entertainers, not magicians!

I think we're going to see exactly the same thing we've seen for 300 years: a single "sense" of a piece of music. You put on a Rolling Stones record and you don't hear a DX7 or a drummer, you hear a record with a sense of itself. Huey Lewis said, "The song tells us what to do next." Overdubbing is just a tool. However, rather than coming full circle away from machines, I think the people who know how to operate the machines are going to demand more performance out of them.

I want better resolution. I've heard the 18-bit 96K digital standard and I like it. I don't believe what the manufacturers say about 16-bit 48K sampling being just fine and you can't hear difference. They're not paying attention. I want it! There's nothing wrong with a 48K release standard, but I don't think there's any reason why we can't have a higher quality mastering standard.

I disagree with George Augsperger. Over

the last 40-odd years of audio production, we've separated the control room, the cutting room, the mix room and the editing room. Historically, the direction would be more specialized rooms—space allowing. A clear indication is the number of existing music-prep and digital-editing rooms.

People would like to think that in 10 years somebody will come along with the magic processor that will run just one edit list and just wrap everything up into one neat package—an 80×64 console, all reverbs and effects, machine control and Winchesters hanging off of everything. That's not going to happen. I think we're still going to be modular and people will have their favorite pieces of equipment. As long as engineers act like hairdressers, they're going to carry their favorite tools around with them. Perceived values and acts of black magic have great meaning. Those black boxes will eventually develop into software tools, but it will take a hell of a computer to run them.

And what about this big, apocalyptic, integrated studio of the future, where you just feed information into it and you get music out of it? That might be a good 50-year plan, but by the time the processors become that powerful, there's going to be some countervailing forces. A funny thing happens in the balance between art and technology. There will be a tremendous leap ahead in technology, and people kind of swing the other way to make humans more of a factor in it. I don't see a simplification, in other words.

**Mike Mancini,
recording engineer**

I think the trend is toward rooms that are more generic production rooms set up for full-blown audio and video. I don't think people can afford specialized rooms. A studio can't survive nowadays just being a record room because of the project/home recording cottage industry. Ours is one of the larger facilities in L.A. and only 20% of our work is for audio. If you're a studio owner, all you have to sell is time. The minimum video rates are four times higher than audio. Video clients don't make you wait 90 days to get paid or buy them lunch or drugs. So a lot of studios are learning that life is easier if they get into the audio-for-video business.

In the old days, people were attracted to custom rooms with custom consoles. Now the industry as a whole dictates what you have to buy. You've got to have an SSL or a V-Series Neve and Mitsubishi or Sony digital tape machines. But it doesn't pay for a studio owner to try to keep up with the Joneses anymore unless they can diversify into other non-record markets.

The 1989 Black Book

About This Resource

RE/P is pleased to bring you this special reference issue, our 1989 Black Book. You may recall that a year ago we published our first Buyers' Guide. Positive reader, advertiser and manufacturer responses clearly showed this popular issue had potential to serve as a comprehensive manual covering far more than buyers' information.

So, this year we unveil a resource to assist you more thoroughly. We've added four new sections to the already substantial Product, Manufacturer and Dealer/Distributor directories. Our Manufacturers' Fax Directory lists facsimile numbers to speed your correspondence with equipment sources. The 1988 Article Index classifies articles according to issue and subject.

The Trade Associations and 1989 Trade Show Calendar sections give addresses and phone numbers for various industry groups, and help you plan your schedule to attend their conventions.

The Product Directory lists manufacturers according to the types of equipment they make, and the Manufacturer Directory alphabetically lists company addresses and phone numbers. The Dealer/Distributor Directory gives addresses and phone numbers of regional distributors, the types of products they handle and the areas they serve.

Throughout the Product Directory, you'll see some companies listed in blue. These are advertisers in this issue, and you can get detailed infor-

mation quickly by referring to their ads. Remember, the Rapid Facts Cards in this Black Book are valid for an entire year to help you get in touch with those advertisers.

The information in this resource issue was compiled by the **RE/P** staff, who mailed questionnaires to pro audio manufacturers and dealer/distributors. All companies that returned their questionnaires are listed. **RE/P** and Intertec Publishing are not responsible for any unreturned questionnaires or inaccurate information provided by respondents. Your company can be included in next year's Black Book by completing and returning the form on page 86 no later than July 1, 1989.

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"I'm using Shure's SM98 more and more because it helps me get that natural drum sound and the mic adds no 'color' of its own. Its small size doesn't obscure the audience's view of the drummer and means the mic is less likely to get hit by drumsticks.

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"To get the fat sound I want, I position the mic about three fingers distance off the drum head and aim it toward the center to avoid unwanted rim harmonics.

"To minimize leakage from adjacent drums, I use Shure's A98SPM polar modifiers to get the isolation a supercardioid provides. I've found that combination works great overhead on the high hat as well. With the pattern control the modifiers provide, it's like having two mics in one.

"For area miking of percussion instruments, I prefer the SM81 because of its extended flat frequency response. And the SM57 still is my first choice on snare and guitar amps."

If you're looking for answers to your miking problems, start where David Morgan does—with Shure.

Call for a free copy of Shure's full line Microphone/Circuitry Catalog. Call 1-800-257-4873 (In Illinois 1-800-624-8522).

Shot on location, Whitney Houston Concert, Madison Square Garden, New York.

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If Only More Expensive Consoles Performed As Well.



For a 16 or 24 track studio owner, the future looks very good.

With MIDI systems and digital outboard gear, you're faced with extremely sophisticated productions. But it's very hard to find a recording console to match the requirements without spending a small fortune.

That's precisely why we've developed the new Series 6000, an evolutionary design that clearly demonstrates the forward thinking of Soundcraft. Behind the classic layout is a revelation in performance and capability.

For one thing, it's equipped with enough busses and routing options to make adventurous productions a pleasure, not a nightmare. The 6000 is a full 16 or 24 buss console with six auxiliary sends per channel. The split format of the 6000 means each of the tape returns will double as extra inputs, with EQ.

We've also provided each input with push-button routing, EQ by-pass, and programmable electronic muting that eliminates the clicks produced by ordinary switches. You even get true solo-in-place, sadly lacking on more expensive consoles.

But it's the 6000's sonic performance that really sets it apart from the competition. Our revolutionary input design gives you 2dB to 70dB gain without a pad and virtually unmeasurable distortion, crosstalk, and noise.

Our new grounding system yields superb hum immunity and a routing isolation of 110dB (1kHz). And our active panpot comes close to theoretical perfection, exceeding our competitor's performance by a full 25dB.

The Series 6000 input module gives you programmable electronic muting under optional MIDI control, solo-in-place to get a clear picture of your progress, and a patented active panpot with isolation of 90 dB (1kHz).

To give you the subtle control it takes to achieve dramatic results, you also get four-band EQ with mid sweeps on each input channel.

When you specify Soundcraft's Series 6000, with options including 16 to 56 channels, stereo input modules, and built-in patchbay, you'll find it an affordable slice of progress. Series 6000, simply the most comprehensive production console in its class.

Soundcraft 6000

Soundcraft USA/JBL Professional
8500 Balboa Boulevard
Northridge, CA 91329

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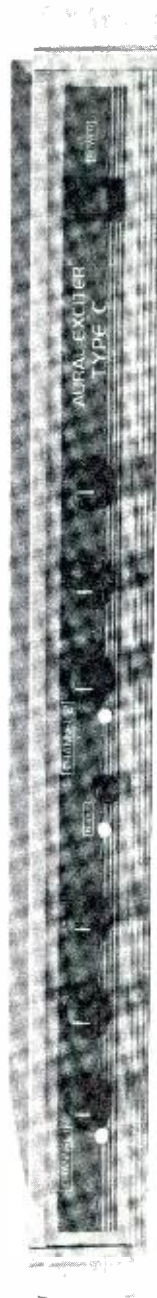
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AES Show Debuts New 2/3/4 Channel Amplifier, Selectable 600/210 Power



The new model 300X4 MOSFET power amplifier from Soundcraftsmen will have its debut at the upcoming AES convention in Los Angeles, California. This new amplifier is a multi-channel design allowing the user to select either two-channel, three-channel or four-channel operation. It is ideal for the large recording studio needing very high power for their monitors—600 watts per channel (two-channel) at 8 ohms, or wishing to bi-amp their monitors—210 watts per channel (four-channel) at 8 ohms.

Or tri-amping using two of the 300X4's (each in the three-channel mode) to provide 600 watts per channel for woofers, 210 watts per channel for mid-range and 210 watts per channel for the high frequency drivers.

The new 300X4 has all the performance you've come to expect from Soundcraftsmen in a convenient, three-rack-space chassis. The 300X4 has two completely independent power supplies and two separate power transformers, sharing only a common power cord. Extremely accurate clipping indicators are included for each channel.

The new Soundcraftsmen 300X4 is completely protected against short circuits, open circuits and input overloads. Thermal protection is provided by Multi-Sensor Phase Control Regulation as well as two multi-speed cooling fans. The new amplifier is standard rack-mount, 19"W x 5 1/4"H x 12"D, weighing 58 pounds.

Circle Reader Service Card # for 200-watt Amplifier Comparison Chart



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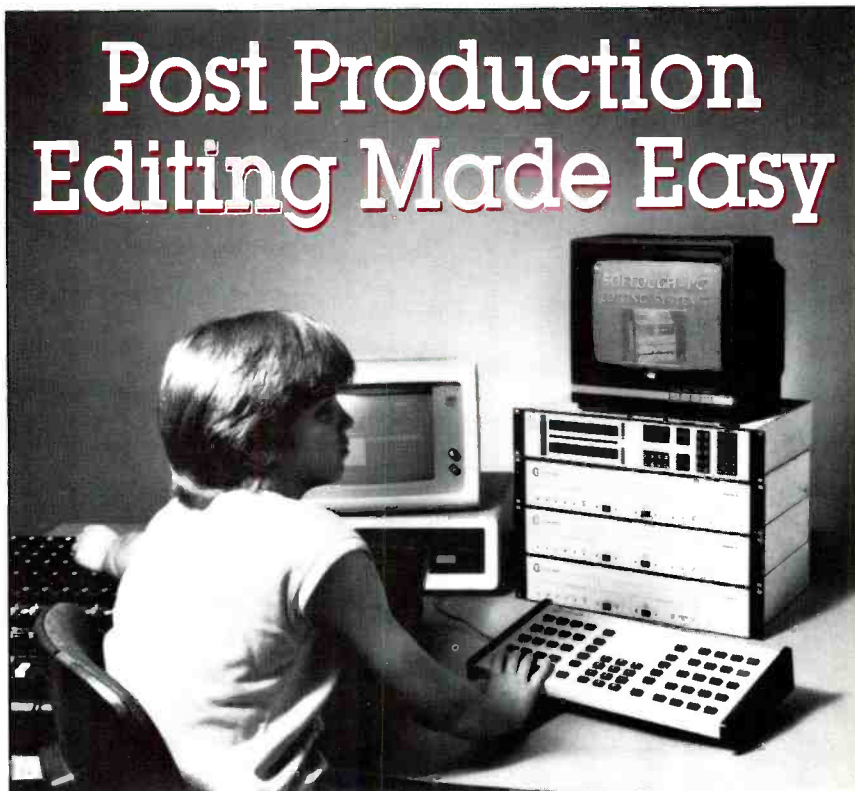
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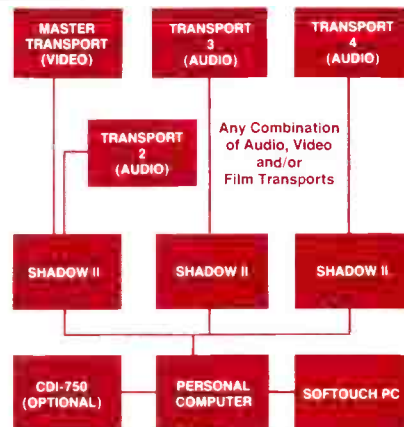


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 Switchcraft, Inc.
 Symetrix Inc.
 TOA Electronics, Inc.
 Ward-Beck Systems Ltd.
 Whirlwind, Inc.
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 Storeel Corp.
 Tek Media Supply Co.
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 U.S.A. Audio
 Whirlwind, Inc.
 Winsted Corp.

RECORDING TAPE, AUDIO

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 Audio Cassette Center
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 Audiolab Electronics, Inc.
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ADA Signal Processors, Inc.
 ADM Technology Inc.
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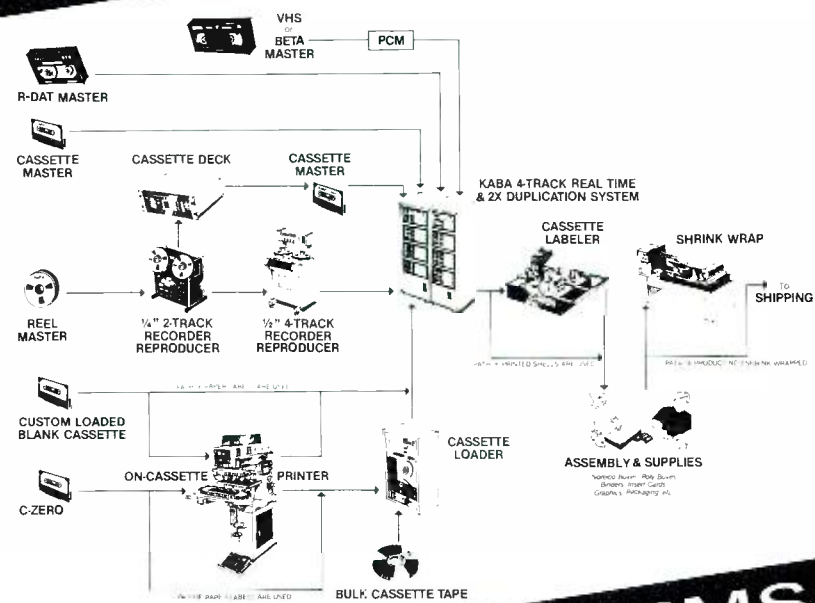
SYNTHESIZERS AND KEYBOARDS

Casio, Inc.
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- Neutrik USA, Inc.
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- Winsted Corp.



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An alphabetical list of manufacturers' addresses and phone numbers.

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AB International Electronics

1830-6 Vernon St.
Roseville, CA 95678
916-783-7800

Accurate Sound Corp.

3515 Edison Way
Menlo Park, CA 94025
415-365-2843

ACO Pacific Inc.

2604 Read
Belmont, CA 94002
415-595-8588

Acoustech Corp.

42 Enterprise Drive
Ann Arbor, MI 48103
313-663-7013

Acoustical Physics Lab

3877 Foxford Drive
Doraville, GA 30340
404-934-9217

Acoustilog Inc.

19 Mercer St.
New York, NY 10013
212-925-1365

ADA Signal Processors, Inc.

7303-D Edgewater Drive
Oakland, CA 94621
415-632-1323
800-241-8888

Adams-Smith

34 Tower St.
Hudson, MA 01749
508-562-3801

ADC Telecommunications

4900 West 78th St.
Minneapolis, MN 55435
612-893-3071

ADM Technology Inc.

1626 E. Big Beaver Road
Troy, MI 48007-2525
313-524-2100

Advanced Music Systems/Calrec

Billington Road
Burnley, Lancs, England
BB11 5ES
0282-57011

AEG Corp.

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800-243-7885

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3630 Holdrege Ave.
Los Angeles, CA 90016
213-467-8000

Allen & Heath

5 Connair Rd.
Orange, CT 06477
203-795-3594

Alpha Audio

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Richmond, VA 23220
804-358-3852

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Thousand Oaks, CA 91360
800-529-2496

Altec Lansing Corp.

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405-324-5311

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St. Laurent, Que., Canada
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514-735-4105
800-361-3697

Amek/TAC US Operations

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North Hollywood, CA 91601
818-508-9788

American Multimedia, Inc.

Concept Design
Route 8 Box 215-A
Burlington, NC 27215
919-229-5554

American Sound & Video Corp.

27,790 Ave. Hopkins
Valencia, CA 91355
805-257-0700

American Sound & Video Corp.

2225 Faulkner Road N.E.
Atlanta, GA 30324
404-633-4577

American Sound & Video Corp.

3 Fairfield Crescent
West Caldwell, NJ 07006
201-575-8484

Ampex Corp.

Magnetic Tape Div.
401 Broadway M.S. 22-02
Redwood City, CA 94063
415-367-3888

Amplified Music Products Corp.

9829 Independence Ave.
Chatsworth, CA 91311
818-709-0518

AMS/Calrec

(AMS Industries Inc.)
31864 Stone Way N.
Seattle, WA 98103
206-633-1956

Amtel Systems, Inc.

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Nashua, NH 03060
603-880-9011

Analog Systems

P.O. Box 35879
Tucson, AZ 85740
602-792-3202

Anchor Audio, Inc.

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213-533-5984
800-262-4671

ANT Telecommunications Inc.

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Gaithersburg, MD 20877
301-670-9777

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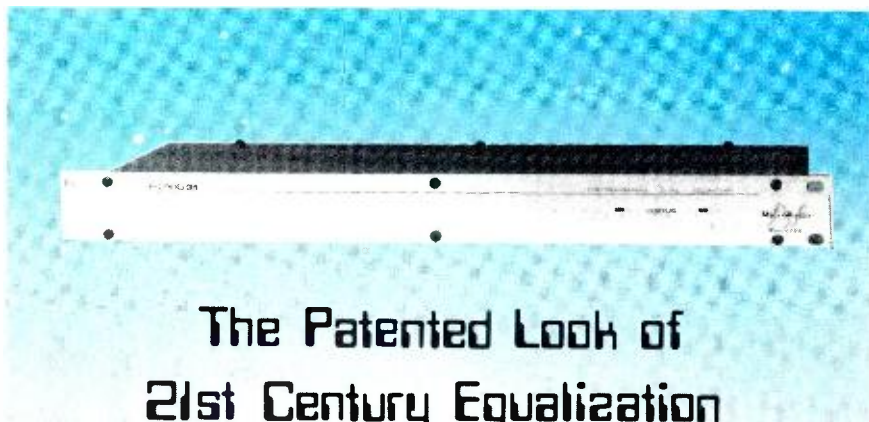
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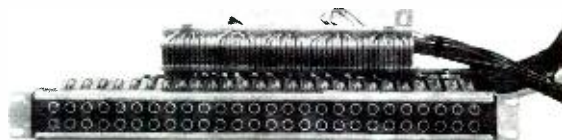
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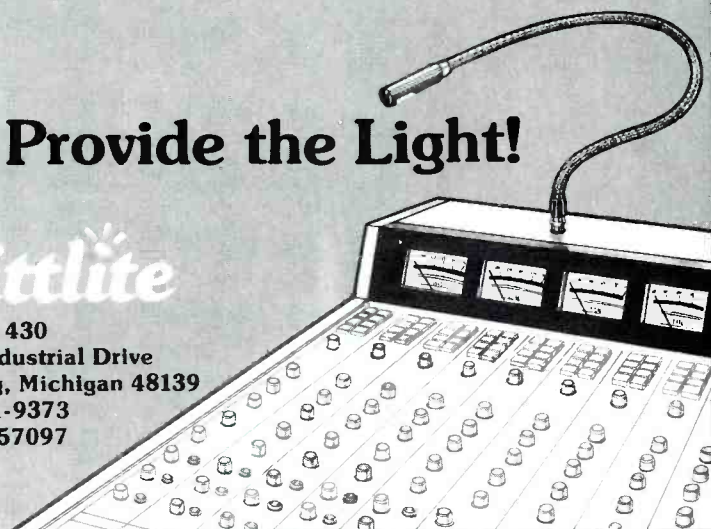
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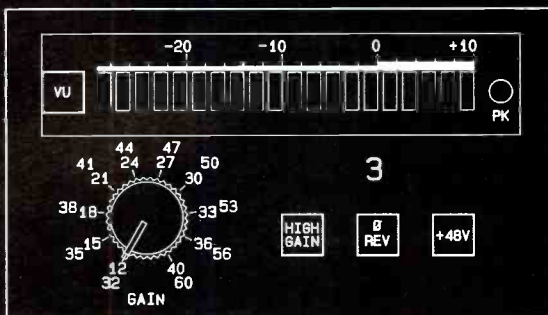


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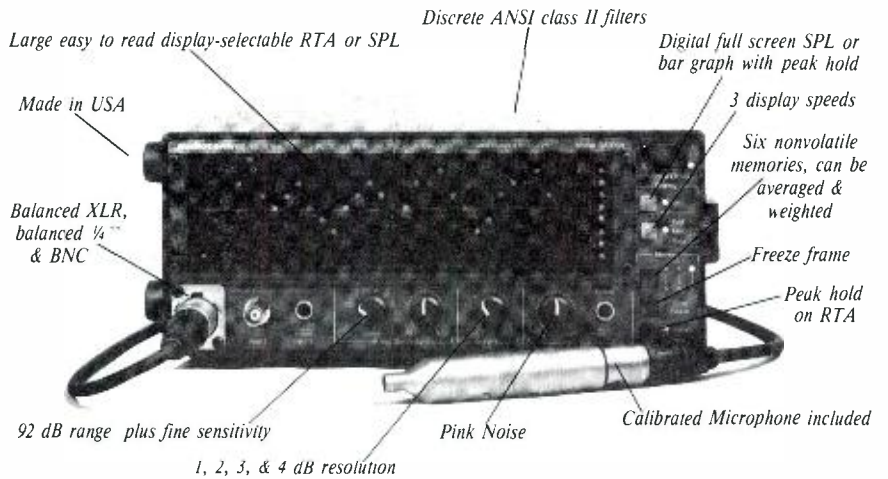
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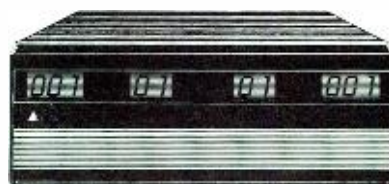
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 New England Digital Corp. 802-296-2075
 Nimbus Records 212-262-5409
 Northam Electronics Inc. 213-550-6783
 Oberheim-ECC 213-888-2874
 Ocean Audio Inc. ... 213-454-6043
 Omnimount Systems .. 818-766-9669
 Omnimusic 516-944-6586
 Opcode Systems 415-321-9034
 Optical Disc Mastering 704-542-5309
 Orion Research 216-267-5894
 Otari Corp. 415-341-7200
 OWI Inc. 213-638-8347
 Oxmoor Corp. 205-942-9633
 Pacific Recorders & Eng. Corp. 619-438-9277
 Paltex Editing Systems 714-838-9619
 Panasonic Industrial Co. 201-348-7549
 Paso Sound Products Inc. 914-738-3954
 Passport Designs Inc. 415-726-2254
 The Patchbay Designation Co. ... 818-507-5050
 Peavey Architectural Acoustics, Peavey Audio Media Research, Peavey Electronics 601-484-4278
 Penn Fabrication NJ Inc. 201-423-4603
 Penn Fabrication USA Inc. 805-499-3184
 Penny & Giles 213-450-9860
 Perma Power Electronics Inc. ... 312-647-1472
 Phi Technologies, Inc. 405-524-4254
 Pioneer Electronics Inc., Technical Audio Devices 213-816-0402
 Polydax Speaker Corp. 508-658-0703
 Pro Co Sound Inc. ... 616-388-9681

The difference is what you don't hear



Each inner conductor has 40 strands of small diameter (.00315") copper wire that provide maximum flexibility and avoid breakage.

"Star-Quad" configuration with 4 inner conductors provides a substantial improvement in rejection of EMI.

Polyethylene insulation is a better dielectric than rubber insulation, thereby reducing capacitive coupling for improved high frequency response

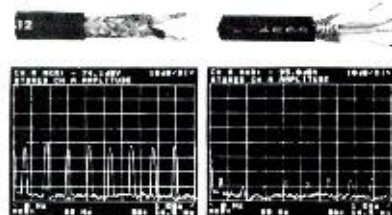
Cotton filler acts as strain relief and also reduces handling noise by preventing changes in stray capacitance

Very high density, braided shield blocks most static and other noise.

Tough yet very flexible jacket can be unpacked from extreme cold and used immediately. The brittle point is -56°F (-49°C).

Available with a satin finish in 10 attractive colors to aid channel identification and/or to complement visual appearance. Fits standard XLR connectors.

You don't hear the fluorescent lights, motors, SCR dimmers, static, buzz, hum and handling noise with Canare L-4E6S. This shielded professional microphone cable is immune to electro magnetic noise due to its unique Star-Quad configuration. Compared to the leading 2-conductor microphone cable, Canare L-4E6S offers 10 times more rejection of the worst source of EMI...impulse noise from SCR dimmers. This cable blocks the noise, but not the program. Its low series resistance and low capacitance give L-4E6S extended frequency response, in mic runs of over 300 feet the 3 dB downpoint is at 50 kHz.



TYPICAL 2-CONDUCTOR MIC CABLE

CANARE L-4E6S

CANARETM

CANARE CABLE INC.

511 5th St., Unit G/San Fernando, CA 91340
 (818) 365-2446

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Professional Audio Systems 213-530-2384	Sonosax SA 41 21 806 02 99 (Switzerland)	3M Broadcasting & Related Products . . 612-736-9433
Promusic Inc. 305-776-2074	Sony Communications Products Co., Professional Audio Div. 201-833-9645	TimeLine Inc. 212-966-7824
Pulizzi Engineering Inc. 714-641-9062	Soper Sound Music Library 415-321-9261	Times One 213-550-6783
QSC Audio Products . 714-645-7927	Sound Technology Inc. 408-318-6847	TOA Electronics Inc. . 415-588-3349
Quantum Audio Labs 714-838-9619	Sound Workshop Professional Audio Products Inc. 516-932-6573	Transtector Systems . . 208-772-9016
Requested Monitoring Systems 44 1 731 3280 (England)	Soundcraft Electronics 44 01 207 0194 (England)	Trax Audio & Music . . 801-292-1249
Radian Audio Engineering Inc. . . 714-961-0869	Soundcraft USA 818-893-3639	Trident Audio USA . . 213-533-7072
Radio Systems Inc. . . 215-356-6744	Soundcraftsmen 714-662-0750	Turtle Beach Softworks 717-848-5390
Ramsa/Panasonic . . . 714-895-7242	Soundmaster USA Inc. 805-494-4936	UCLA Extension Recording Engineering Program 213-206-2815
Rane Corp. 206-347-7757	Soundtracs PLC . . . 44 01 399 6821 (England)	Ultimate Support . . . 303-221-2274
RCA Test Tapes 704-658-2008	Spectrum Design & Development 215-395-7735	UREI 818-893-3639
Recortec Inc. 408-737-8448	Sprague Magnetics Inc. 818-994-2153	U S Audio 716-865-8930
Renkus-Heinz Inc. . . 714-250-1035	Stanton Magnetics Inc. 516-349-0230	Valentino Inc. 212-869-6259
RLS Acoustics 415-541-7872	Steinberg Digital Audio 818-701-7452	Valley International Inc. 615-269-5441
Rocktron Corp. 313-853-5937	Steinberg/Jones 818-701-7452	Vega, A Mark IV Co. . 818-444-1342
Roh Div. Of Anchor Audio Inc. 213-533-6050	Stewart Electronics Corp. 916-635-1787	Versadyne International Inc. . . 408-379-0902
Roland Corp. 213-722-0911	Studer Revox America Inc. 615-256-7619	Video Design Pro . . . 505-524-9669
RPG Diffusor Systems 301-249-3912	Studio Magnetics Co. Inc. 516-289-9150	Ward-Beck Systems Ltd. 416-438-3865
RSP Technologies . . . 313-853-5937	Studio Technologies Inc. 312-982-0747	WaveFrame Corp. . . . 303-447-2351
RTS Systems Inc. . . . 818-843-7953	Summit Audio Inc. . . . 408-395-1403	Westlake Audio 213-851-0182
Saki Magnetics Inc. . . 818-880-6242	Sunn Pro Sound 714-990-3986	Wheatstone Broadcast Group . . . 315-454-8104
Samson Technologies Corp. 516-932-3815	Swintek Enterprises . 408-378-6980	Whirlwind Inc. 716-865-8930
Sanken Microphone, Pan Communications Inc. 81-3-505-5464 (Japan)	Switchcraft Inc. 312-792-2129	Winsted Corp. 612-944-1546
Scantek Inc. 301-279-9309	Symetrix Inc. 206-283-5504	Wireworks 201-686-0483
SCS/Sound Code Systems 714-554-5643	Tannoy North America Inc. 519-745-2364	Yamaha Corp. of America 714-739-2680
Selco Products Co. . . 714-739-1507	Tape Automation . . . 44 279 411573 (England)	
Sennheiser Electronics 203-434-1759	T.C. Electronic 45 6 262928 (Denmark)	
Shape Systems Design 207-879-0439	Technetronics Inc. . . 215-430-6804	
Sharp Electronics Corp. Professional Products Div. 201-529-9636	Technics 201-392-4869	
Shure Brothers Inc. . . 312-866-2279	Techron 219-294-8329	
SILI/Sano Int'l. Ltd. Inc. 201-676-7043	Tektronix Inc., Television Div. 503-627-4486	
Simmons Electronics (USA) Inc. 805-494-9415	Telex Communications Inc. 612-884-0043	
Skotel Corp. 514-465-0071	Thermodyne International 213-603-1929	
Skyelabs Inc. 415-332-5738		
Solid State Logic . . . 212-315-0251		
Solid State Logic . . . 44 865 842118 (England)		
Solid Support Industries 818-444-5157		
Sonic Systems Inc. . . 203-324-0893		

Dealer/Distributor Directory

A state-by-state list of regional dealers/distributors.

The format of these listings is as follows: Company name, address (phone number) region served, products represented.

ALABAMA

Ram Audio, Inc., Morgan Plaza, Hart-selle, AL, 35640 (205-773-0708) AL, Amplifiers; Consoles, Sound Reinforcement, Recording & Production; Equalizers; Loudspeakers, Sound Reinforcement; Microphones & Access.; Recording Tape; Signal Processors; Tape Machines, Analog; Cable Connectors

ARIZONA

Advanced Audio (Div. of Aljon Systems), 3943 E. Whitton Ave., Phoenix, AZ, 85018 (602-954-8155) AZ, CA, NV, NM, UT, Loudspeakers for Monitoring, etc.; General Systems Consulting; Design & Fabrication of Custom Electronics Devices; Specialists in Design & Fabrication of Custom Multi-Amplified Powered Loud-speaker Systems for Professional Applications

Arizona Cine Equipment, 2125 East 20th St., Tucson, AZ, 85719 (602-623-8268) AZ, CA, NM, NV, UT, Amplifiers; Equalizers; Loudspeakers, S.R.; Microphones & Access.; Signal Processors; Test & Measurement; Lighting

Audio Services, P.O. Box 513, Tempe, AZ, 85280 (602-966-0700) AZ, CA, CO, NV, NM, UT, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Access.; Signal Processors; Acoustic Treatment Material

E.A.R. Professional Audio-Video, 2641 E. McDowell Road, Phoenix, AZ, 85008 (602-267-0600) AZ, CA, CO, NM, OK, OR, TX, UT, WA, NY, Amplifiers; Consoles; Editing Systems; Equalizers; Loudspeakers; Microphones; MIDI; Noise Reduction; Recording Tape; Signal Processors; Synthesizers; Tape Dupers; Analog & Digital Recorders, Time Code Synchronizers

The Guitar Shop Ltd., 6830 Fifth Ave., Scottsdale, AZ, 85251 (602-994-8749) AZ, Amplifiers; Consoles, Sound Reinforcement, Recording & Production; Equalizers; Loudspeakers, Reinforcement, Studio Monitoring; Microphones & Access.; MIDI Devices & Sound Samplers; Noise Reduction; Signal Processors; Synthesizers; Tape Machines, Analog

Precision Audio Services, 2641 E. McDowell Road, Phoenix, AZ, 85008 (602-267-0843) AZ, CA, CO, MN, TX, Maintenance, Repair, and Installation of All Professional Grade Audio and Video Production Equip.

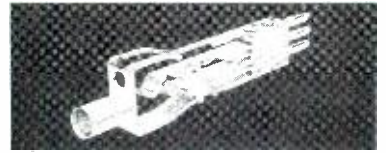
ROH'S Inc., 2922 N. Campbell Ave., Tucson, AZ, 85719 (602-795-8573) AZ, NM, Amplifiers, Consoles, Sound Reinforcement, Recording & Production; Editing Systems, Equalizers, Loudspeakers, Sound Reinforcement, Studio Monitoring; Microphones & Access.; Noise Reduction Systems; Recording Tape, Signal Processors, Tape Machines, Analog & Digital; Test and Measurement Equip., Time Code Synchronizers, Wireless Systems

ARKANSAS

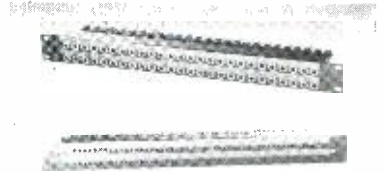
Allrent, Inc., Route 2, Box 19, Perryville, AR, 72126 (501-889-5416) Central & No. West-AR, Audio; Keyboards; Synthesizers; Speakers

Electra-ETC, Highway 65N, Route 7 Box 334, Conway, AR, 72032 (501-327-3724) AR, Services & Sales on: Amplifiers, Sound Reinforcement, Recording & Production; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Access.; MIDI Devices & Sound Samplers; Recording Tape; Signal Processors; Synthesizers & Keyboards; Tape Duplication; Tape Machines, Analog & Digital; Test & Measurement Equip.

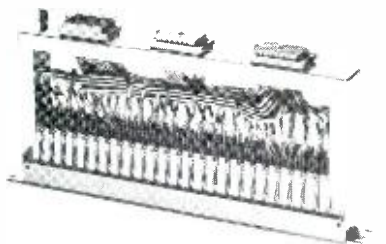
PATCH-BAY PRODUCTS



- 1/4" Long-frame and Mini Telephone Jacks



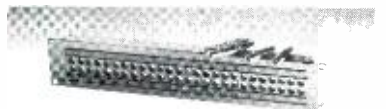
- Jack Panels with Jacks in both sizes
- A variety of Row and Jack Hole Spacings available



- Standard line of Pre-wired Panels
- Custom Wired Panels



- 1/4" & Mini Patch Cords
- Patch Cord Holders
- Polysand



- Video Panels

audio accessories 
audio line

AUDIO ACCESSORIES, INC.
Manufacturer of Audio Line Products.
Mill Street, Marlow, NH 03456
603/446-3335 Quote Line: 603/446-3336

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CALIFORNIA

David L. Abell, Inc., 8162 Beverly Blvd., Los Angeles, CA, 90048 (213-651-3060) CA, Amplifiers; Equalizers; Loudspeakers, Studio; MIDI Devices & Sound Samplers; Signal Processors; Synthesizers & Keyboards; Time Code Synchronizers

Advanced Recording Products, 7190 Clairemont Mesa Blvd., San Diego, CA, 92111 (619-277-2540; 800-854-1061; CA-800-858-1061) Nationwide, Recording Tape; Tape Duplication-audio cassettes; Cassettes; Reels & Boxes; Splicing & Leader Tape; Hold Down Tape; Video Tape; Studio Dispensers and More

AEA, Inc., 1029 N. Allen Ave., Pasadena, CA, 91104 (818-798-9127) So.-CA, Consoles; Digital Processors; Recorders; Microphones; Stands & Acces.; Audio Tape; Signal Processing; Noise Reduction Systems; Reverb, Echo & Delay; Synchronizers; Preamps/Amps/Loudspeakers/Headphones; Cables & Connectors; Turntables; Cartridges; Test Equip.; MIDI; Accessories & Misc. Equip.

Dan Alexander Audio, 2944 San Pablo Ave., Berkeley, CA, 94702 (415-644-2363) Worldwide, All types of professional used recording gear. Microphones; Consoles, Recording & Production; Equalizers; Outboard Gear

Derek Allen Associates, P.O. Box 2229, Toluca Lake, CA, 91602 (818-840-8327) AZ, So.-CA, HI, So.-NV, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Equalizers; Loudspeakers, Studio Monitoring; Microphones & Acces.; Signal Processors; Test & Measurement Equip.; Cable, Audio & Video

ASC Video Corporation, 3816 Burbank Blvd., Burbank, CA, 91505 (818-843-7004) CA, Video Editing Systems; Microphones & Acces.; Recording Tape; Tape Machines, Analog; Time Code Synchronizers

Associated Sound, 2120 P St., Sacramento, CA, 95816 (916-443-4773; 800-492-6800; FAX 916-443-4748) CA, NV, Amplifiers; Consoles SR; Equalizers; Speakers; Microphones; Signal Processors, Tape Machines, DAT Analog; Test & Measurement Equip.; Walkie Talkies

Audio Images Corp., 70 Oak Grove St., San Francisco, CA, 94107 (415-957-9131) AK, CA, CO, HI, ID, MT, NV, OR, WA, WY, Mixing Consoles; Tape Recorders; Cart Machines; Synchronizers; Microphones; Signal Processors; Reveration; Power Amplifiers; Speakers Sys-

tems; MIDI Access; Drum Machines; Computers; Tape; Test Equip.; Sound Libraries



Audio Intervisual Design, 1032 N. Sycamore Ave., Los Angeles, CA, 90038 (213-469-4773) AZ, CA, CO, FL, GA, HI, IL, MI, NV, OR, TN, UT, VA, Amplifiers; Consoles, Recording & Production; Editing Systems; Equalizers; Loudspeakers, Studio Monitoring; Microphones & Acces.; MIDI Devices & Sound Samplers; Recording Tape; Tape Duplication; Tape Machines, Analog & Digital; Time Code Synchronizers; Digital Interfaces

Audio LA, 11349 Santa Monica Blvd., Los Angeles, CA, 90025 (213-477-1516) AK, AZ, CA, CO, HI, OR, NV, NM, TX, UT, WA, A full service organization specializing in Music and Audio Production Systems for recording, video and film-scoring applications. Our expertise includes system design and installation, advanced SMPTE and MIDI engineering, and computer-assisted musicsystems

Audio Services Corp., 10639 Riverside Drive, North Hollywood, CA, 91602 (818-980-9891) USA & Canada, Audio Equip.-Film, Video, Live Entertainment, News; Test & Measurement Equip.; Tape; Service & Repair; Used Equip.

Audio Village, P.O. Box 4692, Palm Springs, CA, 92263 (619-320-0728) USA, Asia, Canada, Europe, All Equip.-Used (Consignment & From Stock) Sales; Recording; PA; Musical Instruments; Computers; Replacement Heads

Bananas At Large, 802 Fourth St., San Rafael, CA, 94901 (415-457-7600) USA, GU, PR, VI, Amplifiers; Consoles, Recording Production & Sound Reinforcement; Editing Systems; Equalizers; Loudspeakers, Sound Reinforcement, Microphones & Acces.; Loudspeakers, Studio Monitoring; Microphones & Sound Samplers; Noise Reduction Systems; Recording Tape; Signal Processors; Synthesizers & Keyboards; Tape Duplication; Tape Machines, Analog & Digital; Test & Measurement Equip.; Time Code Synchronizers

Berman Gravley Co., Inc., 350-B Fisher Ave., Costa Mesa, CA, 92626 (714-549-2122) So.-CA,

So.-NV, Amplifiers; Microphone & Acces.; Portable P.A. Systems; Broadcast Circuitry; Signal Processor; Cables

B & L Sales, Inc., 10640 Magnolia Blvd., North Hollywood, CA, 91601 (818-985-1792) National, Microphones & Acces.; Recording Tape; Tape Duplication Equip.; Blank Cassettes; Cassette Recorders, Boxes & Labels; Empty Reels & Boxes; Recorder Care Accessories

Bowdish Associates, 4432 Ensenada Drive, Woodland Hills, CA, 91364 (818-704-6324) AR, CA, HI, NV, UT, A/V Distribution/Routing; Video Matting, Keyers, Audio Edit Consoles, Degaussers, Encoders/Decoders, Time Code Equip.; Prompters

Broadcast Cartridge Service Inc., 15131 Triton Lane, Suite 108, Huntington Beach, CA, 92649 (714-898-7224) USA, Recording Tape

Christy's Editorial Film Supply, Inc., 135 N. Victory Blvd., Burbank, CA, 91502 (818-845-1755) USA, Alta, Ont. in Canada, Recording Tape; Film Editing Equip.-Sales & Rentals Magnetic Film; Leaders; Editorial Tapes and Supplies

CMTV Inc., 1900 W. Burbank Blvd., Burbank, CA, 91506 (818-843-6644; 714-841-4397) CA, CT, DE, IN, MD, MA, NV, NJ, NY, OR, PA, RI, VT, WA, Amplifiers; Editing Systems; Equalizers; Loudspeakers, Studio Monitoring; Microphones & Acces.; Recording Tape; Signal Processors; Tape Machines, Analog & Digital; Time Code Synchronizers; Studio Microphones

Creative Marketing Group Inc., 2720 Monterey St., Torrance, CA, 90503 (213-533-5112) USA & Canada, Consoles Recording, Production & Sound Reinforcement

Custom Audio Electronics, dba C.A.E. Sound, 1150 E. Santa Inez Ave., San Mateo, CA, 94401 (415-348-2737) CA, Service only on: Amplifiers; Consoles; Equalizers; MIDI Devices & Sound Samplers; Noise Reduction Systems; Signal Processors; Tape Machines, Analog; Time Code Synchronizers; Custom Equip. Design; Studio Installations; Keyboard Specialists

Digital Dispatch, Inc., P.O. Box 4426, Burbank, CA, 91503 (818-952-FAST; 800-446-FAST; 213-644-FAST) USA & Canada, Tape Machines, Analog & Digital; Time Code Synchronizers; Signal Processors; Recording Tape; Video Monitors; Equalizers; Digital Reverbs & Delays; MIDI Devices & Sound Samplers; Noise Reduction Systems;

Microphones & Acces.; Synthesizers & Keyboards

Dan Dugan Sound Design, 290 Napoleon St., Studio E, San Francisco, CA, 94124 (415-821-9776) No.-CA, Tape Machines, Analog; Recording Tape

Educational Electronics Corp., P.O. Box 339, Inglewood, CA, 90306 (213-677-8167) National, Audio Cassette Duplicators

Embassy Cassette, Inc., 3617 W. MacArthur, Suite 500, Santa Ana, CA, 92704 (714-557-5757; 800-541-8899) USA, Recording Tape; Tape Duplication

The Enright Co., P.O. Box 91298, Long Beach, CA, 90807 (213-595-4624) AZ, CA, NV, NM, HI, Test & Measurement Equip.; Time Code; Accessories; Digital Effects; Time Base Correctors; Video/Audio D.A.'s; Sync Generators; Cases; Miniature Chip Cameras

Everything Audio, 2721 W. Burbank Blvd., Burbank, CA, 91505 (818-842-4175) CA, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Loudspeakers, Studio Monitoring; Microphones & Acces.; MIDI Devices & Sound Samplers; Noise Reduction Systems; Recording Tape; Signal Processors; Synthesizers & Keyboards; Tape Duplication; Tape Machines, Analog & Digital; Test & Measurement Equip.; Time Code Synchronizers

See advertisement on page IBC

Gefen Systems, 5068 San Feliciano Drive, Woodland Hills, CA, 91367 (818-884-6294) Nationwide, Disc Loaders; Editing Systems; Time Code Synchronizers; Software Packages

Goodman Music, 4227 Lankershim Blvd., North Hollywood, CA, 91602 (818-760-4430) So.-CA, Keyboards & Synthesizers; MIDI Products; Drum Machines; Sequencers

Guitar Trader, 5035 Shawline St., San Diego, CA, 92111 (619-565-8814) CA, Amplifiers; Consoles Equalizers; Synthesizers & Keyboards; Tape Machines Misc. Acces.; Loudspeakers

Haight Ashbury Music Center, 1540 Haight St., San Francisco, CA, 94117 (415-863-7327) CA, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Editing Systems; Equalizers; Loudspeakers, Sound Reinforcement; Loudspeakers, Studio Monitoring; Microphones & Acces.; MIDI Devices & Sound Samplers; Noise Reduction Systems; Recording Tape; Signal Processors; Synthesizers & Keyboards; Tape Duplication; Tape Machines, Analog & Digital

Integrity Sound, 1472 N. Van Ness, Fresno, CA, 93728 (209-237-9640) CA, Amplifiers; Consoles, Sound Reinforcement, Recording & Production; Equalizers; Loudspeakers, Sound Reinforcement, Studio Monitoring; Microphones & Access.; Noise Reduction Systems; Recording Tape; Signal Processors

Jensen Transformers, Inc., 10735 Burbank Blvd., North Hollywood, CA, 91601 (213-876-0059) USA & Canada, Amplifiers; Microphone Pre Amps; Audio Transformers; Moving Coil Cartridge Step-Up Units, AC-Circuit Analysis & Optimization Software; Phono Pre Amps; Power Amplifiers

Leo's Audio & Music Technologies, 5447 Telegraph Ave., Oakland, CA, 94609 (415-652-1553) CA, NV, OR, WA, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Equalizers; Loudspeakers; Microphones; MIDI Devices; Noise Reduction Systems; Tape; Processors; Synthesizers & Keyboards; Tape Duplication; Tape Machines, Analog & Digital; Test Equip.; Time Code Synchronizers

Lexicon, 2323 Cornith Ave., West Los Angeles, CA, 90064 (213-479-2771) So-CA, Editing Systems; Signal Processors

David Lint Associates, Inc., 19520 Chaffee Circle, Groveland, CA, 95321 (209-962-5555) CA, FL, HI, ID, OR, UT, WA, Amplifiers; Consoles, Sound Reinforcement, Recording & Production; Equalizers; Loudspeakers, Studio Monitoring, Sound Reinforcement; Microphones & Access.; Noise Reduction Systems; Recording Tape; Tape Duplication; Tape Machines, Analog; Video Systems; Motor Repair Service

Master Recording Supply, 4000 W. Magnolia Blvd., Burbank, CA, 91505 (818-841-7500) AZ, CA, CO, HI, MT, NV, NM, OR, UT, WA, Recording Tape; Tape Duplication Systems; Test & Measurement Equip.; Tape Loading Equip., Cassette Labeling Equip.

Master Hi-Fidelity, Inc., 2199 El Camino Real, San Mateo, CA, 94403 (415-573-6506) CA, Signal Processors; Computer Synthesizers & Keyboards; Tape Duplication; Tape Machines, Analog &

Digital; Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Access.; MIDI Devices & Sound Samplers; Noise Reduction Systems, Recording Tape

Mayhew & Co., 3115 W. Olive, Suite 6, Burbank, CA, 91505 (818-840-9293) CA, Wireless Microphones; Sales; Rental & Service

Sye Mitchell Sound Co. Inc., 22301 Cass Ave., Woodland Hills, CA, 91364 (818-348-4977) Worldwide, Amplifiers; Consoles, Recording & Production; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Access.; Noise Reduction Systems; Signal Processors; Tape Machines, Analog & Digital; Time Code Synchronizers

Music Power Rentals, 4693 University Ave., San Diego, CA, 92105 (619-282-4011) CA, Amplifiers; Consoles, Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement; Microphones & Access.; MIDI Devices & Sound Samplers; Noise Reduction Systems;

Signal Processors; Synthesizers & Keyboards; Tape Machines, Analog & Digital

New World Audio Express, 4792 Clairemont Mesa Blvd., San Diego, CA, 92117 (619-569-1944; 800-854-2005) USA, Amplifiers; Consoles (recording, production, sound reinforcement); Editing Systems; Equalizers; Loudspeakers (sound reinforcement, studio monitoring); Microphones & Access.; MIDI Devices & Sound Samplers, Noise Reduction Systems; Recording Tape; Signal Processors; Synthesizers & Keyboards, Tape Duplication; Tape Machines (analog), Time Code Synchronizers

Ocean Audio, 366 Las Casas, Pacific Palisades, CA, 90272 (213-459-2743) National, Used Equipment Broker, All Products Handled

Omega Video, Inc., 4196 Cleveland Ave., San Diego, CA, 92103 (619-299-6250; 602-258-0509) AZ, CA, NV, NM, Amplifiers; Consoles-Recording & Production; Editing Systems; Studio Monitoring; Microphones & Access.; Signal Processors; Tape Machines, Test & Measurement Equip.; Time Code



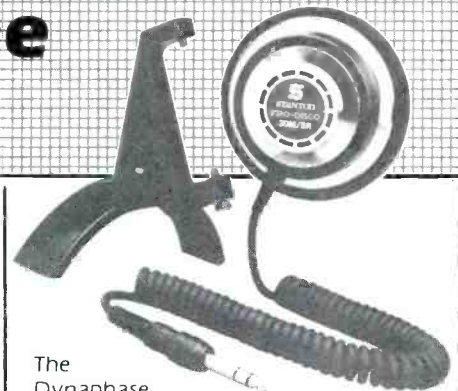
The choice of the professionals...



310B PROFESSIONAL PHONO PREAMP/EQUALIZER
... Interfaces magnetic phono cartridges for optimum calibration of audio systems. Available with balanced or unbalanced output.



PBR ANNOUNCER'S EARPHONE
... Ideal for on camera studio work and remote coverage.



The **Dynaphase 30M/SR** is a shoulder rest single cup headphone that provides the ultimate in convenience, comfort and superb sound quality. Made to rest on either your left or right shoulder, or shoulder rest can be detached and used as a single cup hand-held monitor.



680EL ... Delivers sound excellence and stands up to backcueng, vibrations and mishandling.

Stanton is the company with a total commitment to quality and reliability—producing products for the Recording Industry, the Broadcast industry and the Professionals in Audio.



101 Sunnyside Blvd., Plainview, NY 11803



500AL ... For heavy duty on-the-air use with wide tracking force range

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- Synchronizers; Video Production & Editing Equip.; Cable & Connectors
- Pacific Coast Marketing**, 14125 Capri Drive, Los Gatos, CA, 95030 (408-370-3505) CA, NV, Cart Machines & Carts; Test & Measurement Equip.
- Pacific Radio Electronics**, 1351 Cahuenga Blvd., Hollywood, CA, 90028 (213-462-1393; 818-762-8950; 714-641-7433; 800-634-9476) National By Catalog, Wire & Cable; Connectors; Patching Systems; Tool & Technical Aids; Cleaning & Maintenance Supplies
- Pacific Recorders & Engineering Corp.**, 2070 Las Palmas Drive, Carlsbad, CA, 92009 (619-438-3911) Worldwide, Noise Reduction Systems; Consoles, Recording & Production; Equalizers; Tape Machines, Analog
- Patterson & Associates**, 2555 E. Chapman Ave., Suite 300, Fullerton, CA, 92631 (714-992-1422) CA, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; Signal Processors; MIDI Devices & Sound Samplers; Synthesizers & Keyboards, Tape Duplication; Tape Machines Analog
- Pegasus Productions**, 676 Bockman Road, Suite G, San Lorenzo, CA, 94580 (415-481-1126) CA, Amplifiers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Access.
- Peoples Music**, 122 N. Main St., Sebastopol, CA, 95472 (707-823-7664) CA, Amps; Loudspeakers; Microphones; Recording Tape; Signal Processors
- Pro Sound, A Div. of Cal Switch**, 13717 S. Normandie Ave., Gardena, CA, 90240 (213-770-2330; 800-CAL-SWCH) USA, Audio Connectors, Wire & Cable Assemblies; Jack Panels; Switches
See advertisement on page 38
- Professional Audio Services & Supply Co.**, 619 S. Glenwood Place, Burbank, CA, 91506 (818-843-6320) CA, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Equalizers; MIDI Devices & Sound Samplers; Microphones & Acces.; Signal Processors; Tape Duplication; Tape Machines, Analog; Loudspeakers, Sound Reinforcement & Studio Monitoring
- Rainbow Park**, 1033 Battery St., Suite 204, San Francisco, CA, 94111 (415-421-2875) CA, Amplifiers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; Recording Tape; Tape Duplication; Tape Machines, Analog; Multi-Image Control Equip.
- RGS-Richard Griffin Sales**, 8519 Chester St., Paramount, CA, 90723 (213-634-3042) So.-CA, Consoles Recording, Production & Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; Noise Reduction Systems; Signal Processors; Tape Machines, Analog; Time Code Synchronizers; Full Line Video & Photographic Equip.
- R & M Pro Audio**, 1080 Pacheco St., San Francisco, CA, 94116-1318 (415-665-8480) CA, FL, ID, IN, LA, NY, OK, WA, BC, Editing Systems; Microphones; Recording Tape; Tape Machines, Digital; Mixers, Head Cleaners; Plastic Reels; Alignment Tapes; Razor Blades; Access.
- Santa Cruz Sound Co.**, 2-1513 E. Cliff Drive, Santa Cruz, CA, 95062 (408-475-0768) Monterey Bay & San Francisco Metro. Areas, Amplifiers; Consoles; Equalizers; Loudspeakers (Loudspeaker Reconing-Electronic Repair); Microphones; DJ Supplies; Sound Systems Rental, Microphone Stand Repair; Cabinet Hardware; Tube Specialists
- Sawyer Camera & Video Co.**, 1208 W. Isabel St., Burbank, CA, 91506 (818-843-1781; 800-423-7779) AK, AZ, AR, CA, CO, GU, HI, ID, IL, IN, IA, KS, KY, LA, MI, MN, MS, MO, MT, NE, NV, NM, ND, OK, OR, SD, TX, UT, WA, WI, BC in Canada, Amplifiers; Loudspeakers; Microphones
- Sequoia Electronics**, 209 Lester Lane, Los Gatos, CA, 95032 (408-356-3232) AK, AZ, CA, HI, ID, NV, NM, OR, WA, Equalizers; Signal Processors; Tape Machines, Analog; Magnetic Tape Heads; Recorder Care Products; Test Tapes, Carts & Cassettes; Clocks & Timers; Repair Parts; Consoles, Recording & Production; Cart Tape Recorders
- Skip's Music, Inc.**, 2740 Auburn Blvd., Sacramento, CA, 95821 (916-484-7575) No.-CA, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; MIDI Devices & Sound Samplers; Noise Reduction Systems; Recording Tape; Signal Processors; Synthesizers & Keyboards; Tape Duplication; Tape Machines, Analog
- The Sound Center**, 9278 Civic Center Drive, Beverly Hills, CA, 90210 (213-274-6951) CA, Amplifiers; Equalizers; Loudspeakers, Studio Monitoring; Microphones & Acces.; Noise Reduction Systems; Recording Tape; Signal Processors; Tape Machines, Analog
- Sound Expressions**, 3249 Santa Rosa Ave., Santa Rosa, CA, 95407 (707-528-3565) CA, HI, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring, Microphone & Acces.; MIDI Devices & Sound Samplers; Signal Processors; Tape Machines, Analog
- The Source Audio Group**, 471 Anaheim Blvd., Orange, CA, 92668 (714-937-1237) Worldwide, Audio Products; Recording, Sound System, Lighting-Sales Rental, Service, Concert Production
- South Bay Sound & Light**, P.O. Box 174, El Segundo, CA, 90245 (213-322-6059) Greater Los Angeles Area, Loudspeakers, Sound Reinforcement; Microphones; Amplifiers; Consoles; Signal Processors; Stage Lighting Equip.
- Stanislaus Audio Visual**, 1431 Kansas Ave., Modesto, CA, 95351 (209-529-2700; 800-341-1441) CA, Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; Tape Machines, Analog; Tape Duplication
- Suntronics**, P.O. Box 734, Upland, CA, 91786 (714-985-0701) So.-CA, Remote Controls
- Tele-MIDI**, 30 N. Raymond Ave., Suite 612, Pasadena, CA, 91103 (818-584-5814; 800-888-MIDI) USA & Canada, MIDI Services & Sound Samplers; MIDI Software & Peripherals
- Thrifty Electronic Supply Co.**, 13643 Burbank Blvd., Van Nuys, CA, 91401 (818-786-1610) CA, Amplifiers; Equalizers; Loudspeakers, Studio Monitoring & Acces.; Recording Tape; Tape Machines, Analog & Digital; Full Repair Facility Audio/Video
- T.M.B. Associates**, 3416 W. Burbank, Burbank, CA, 91505 (818-842-9651) USA, Cable & Connectors; Cases; Lighting Equip.; Microphones, Studio; Patchbay & Jack Panels; Peripheral & Miscellaneous Acces.
- Brian Trankle & Associates**, 1504 Industrial Way, Suite 4, Belmont, CA, 94002 (415-595-4004) CA, HI, NV, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; MIDI Devices & Sound Samplers
- VIF International**, P.O. Box 1555, Mountain View, CA, 94502 (408-739-9740; 800-848-4428) Worldwide, Recording Tape; Spare Parts for Professional A/V Recorders; Motor Remanufacturing
- Virtual Designs Ltd.**, 7325 Hinds Ave., North Hollywood, CA, 91605 (818-503-1292) Worldwide, Signed Processors; MIDI Devices & Samplers, Equalizers; Consoles; Recording & Production; Turnkey Design Services
- WAH Systems Corp.**, 915 Fee Drive, Sacramento, CA, 95815 (916-924-9911) Western USA, Complete auditorium systems recording, video, audio, lighting, & controls.
- West LA Music**, 11345 Santa Monica Blvd., Los Angeles, CA, 90025 (213-477-1945) Nationwide, mostly-CA, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Editing Systems; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring, Microphones & Acces.; MIDI Devices & Sound Samplers; Noise Reduction Systems; Recording Tape Signal Processors; Synthesizers & Keyboards; Tape Duplication; Tape Machines, Analog & Digital; Test & Measurement Equip.; Time Code Synchronizers
- Westlake Audio**, 7265 Santa Monica Blvd., Los Angeles, CA, 90046 (213-851-9800) USA, Pro Audio Equip.
- Westwood Musical Instruments, Inc.**, 2301 Purdue Ave., Los Angeles, CA, 90064 (213-478-4251) USA & Canada, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Equalizers; Loudspeakers, Studio Monitoring & Sound Reinforcement; Microphones & Acces.; MIDI Devices & Sound Samplers; Recording Tape; Signal Processors; Synthesizers & Keyboards; Tape Machines; Time Code Synchronizers; MIDI Guitar Systems; Acoustic & Electric Guitars; Electronic Service; Guitar Repair; Software
- Zack Electronics**, 1380 Howard St., San Francisco, CA, 94105 (415-626-1444) NO.-CA, Amplifiers; Loudspeakers, Sound Reinforcement; Microphones & Acces.; Test & Measurement Equip.; Wire & Cable; Audio/RF Connectors; Chemicals; Batteries; Racks, Chassis; Electronic Hardware; UPS/Power Filters & Conditioners; Tools

COLORADO

- H.P. Marketing Co.**, 2530 W. Church Ave., Littleton, CO, 80120 (303-794-8367; 602-946-5282) AZ, CO, MT, NM, UT, WY, Amplifiers; Consoles, Sound Reinforcement, Recording & Production;

Equalizers; Loudspeakers, Reinforcement & Studio Monitoring; Signal Processors

Jackson Sound Productions Ltd., 3897 S. Jason St., Englewood, CO, 80110 (303-761-7940) CO, Recording Tape; Tape Duplication

Kart Kair, 9445 West 52nd Ave., Denver, CO, 80002 (303-422-7219) Worldwide, Recording Tape & Cartridges; Broadcast Carts & Products; Cartridge Remanufacturing

Mirromere Audio, 7150 West 38th Ave., Wheatridge, CO, 80033 (303-431-2348) CO, CA, ID, KS, MT, NE, NJ, NM, NY, UT, WY, Amplifiers; Consoles, Sound Reinforcement & Recording & Production; Editing Systems; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; Noise Reduction Systems; Recording Tape; SignalProcessors; Tape Machines, Analog; Test & Measurement Equip.; Time Code Synchronizers

Research Associates Inc., 230 S. Sierra Madre, Colorado Springs, CO, 80903 (719-594-9464) Western States, Tape Recorders; Speakers

Wind Over The Earth, Inc., 1135 Pearl St., Suite 7, Boulder, CO, 80302 (303-443-9822) CO, Amplifiers; Equalizers; Microphones & Acces.; Noise Reduction Systems; Recording Tape; Signal Processors; Tape Duplication; Tape Machines, Analog & Digital; Time Code Synchronizers

CONNECTICUT

John B. Anthony Co., 922 High Ridge Road, Stamford, CT, 06905 (203-322-9202; 212-585-2027) Metro-NY, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones; Noise Reduction Systems; Signal Processors; Tape Duplication; Tape Machines, Analog & Digital; Test & Measurement Equip.; Time Code Synthesizers

Cassette Tek, 408 Woodbury Road, Watertown, CT, 06795 (203-274-6955) CT, ME, MA, NH, RI, VT, Cassette Duplication & Equip.

The Music People, Inc., P.O. Box 648, West Hartford, CT, 06107 (203-236-7134) USA, Signal Processors; Loudspeakers, Sound Reinforcement; Microphones & Acces.; Headphones; Stereo Mixers

North Star Audio Video Corp., 1367 High Ridge Road, Stamford, CT, 06903-4908 (203-968-2323;

Fax 203-322-4993) CT, ME, NH, NJ, NY, PA, VT, Amplifiers; Consoles, Sound Reinforcement, Recording & Production; Editing Systems; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; MIDI Devices & SoundSamplers; Noise Reduction Systems; Recording Tape; Signal Processors; Synthesizers & Keyboards; Tape Duplication; Tape Machines, Analog, Digital; Test & Measurement Equip.; Time Code Synchronizers; Cable; Connectors

FLORIDA

AMP Services, 224 Datura St., Suite 614, West Palm Beach, FL, 33401 (407-659-4805; 800-826-0601) Worldwide, Parts for: Tape Duplication & Tape Machines, Analog; Relapping Audio Heads; Rebuilt Capstan Motors

Computers & Music, 19470 N.W. 59th Ave., Miami, FL, 33015 (305-620-4483) Miami, Caribbean, MIDI & Recording Studio Consultant; Recording Studio; Monitoring; Computer Sequencing

Harris Audio Systems, Inc., 1962 N.E. 149th St., N. Miami, FL, 33181 FL, PR, VI, Amplifiers; Consoles, Recording, Production & Sound Reinforcement, Editing Systems, Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Noise Reduction Systems; Recording Tape; Signal Processors; Tape Duplication; Tape Machines, Analog & Digital; Time Code Synchronizers

Omni Technology, Inc., 120 S.W. 21st Terrace, Suite C-104, Fort Lauderdale, FL, 33312-1462 (305-583-0626; Fax 305-791-8986 USA, Amplifiers; Consoles-Sound Reinforcement, Recording & Production; Loudspeakers-Studio Monitoring & Sound Reinforcement; Recording Tape & Acces.; Tape Machines, Analog & Digital

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Integrity Audio, 2759 Skyland Drive N.E., Atlanta, GA, 30319 (404-636-2601) AL, GA, NC, SC, TN, Amplifiers; Consoles, Recording; Microphones; Loudspeakers, Studio Monitoring; Equalizers; Signal Processors; Tape Machines, Analog & Digital

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Sound Investment Co., Inc., 3586 Pierce Drive, Chamblee, GA, 30341 (404-458-1679) So.east USA, Shipping Nationwide, Recording Tape; Equalizers; Loudspeakers-Studio Monitoring; Microphones & Access.; Signal Routing & Patching Equip.; Cables; Studio Editing & Production Supplies; Studio D-Mag & Erase Products; Tape Reels & Boxes

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Full Circle Music Center, 1901 Kapiolani Blvd., Honolulu, HI, 96826 (808-941-3944) HI, Amplifiers;

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IDAHO

Sun Valley Audio, P.O. Box 285, Sun Valley, ID, 83353 (208-726-3476) ID, MT, Amplifiers; Consoles, Sound Reinforcement, Recording & Production; Equalizers; Loudspeakers, Sound Reinforcement, Studio Monitoring; Microphones & Access.; MIDI Devices & Sound Samplers; Noise Reduction Systems; Recording Tape; Signal Processors; Synthesizers & Keyboards; Tape Machines, Analog, Digital; Test & Measurement Equip.; Time Code Synchronizers

ILLINOIS

AAA Swing City Music, 1312 Vandalia, Collinsville, IL, 62234 (618-345-6700; 314-421-1558) IL, MO, Amplifiers; Consoles; Recording, Production & Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Access., MIDI Devices & Sound Samplers; Noise Reduction Systems; Recording Tape; Signal Processing; Synthesizers & Keyboards; Tape Machines, Analog; Time Code Synchronizers

Audio Resources, Inc., 778 Burr Oak Drive, Westmont, IL, 60559 (312-665-1180) IL, IN, KY, WI, Amplifiers; Consoles, Production & Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Access.; Noise Reduction Systems; Signal Processors; Tape Machines, Analog; Test & Measurement Equip.; Time Code Synchronizers; Wire & Cable

Bridgewater Custom Sound, P.O. Box 135, South Holland, IL, 60473 (312-596-0309) IL, IN, MI, WI, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Misc. & Accessories; Noise Reduction Systems; Recording Tape; Signal Processors; Tape Duplication; Tape Machines, Analog; Test & Measurement Equip.; Time Code Synchronizers

Columbia Audio/Video, 1741 Second

St., Highland Park, IL, 60035 (313-433-6010) IL, IN, IA, MO, WI, Consoles; Editing Systems; Microphones & Access.; Recording Tape

Computer Musicians Cooperative, 3010 N. Sterling Ave., Peoria, IL, 61604 (309-685-4843) Worldwide, Software & Access. for Computers Used in Music Application

Conquest Sound Inc., 7319 Duvan Drive, Tinley Park, IL, 60477 (800-323-7671; 312-429-1770) Worldwide, Wire; Audio Connectors; Audio Wiring Systems; Splitting Systems; Audio Cables; Stage Boxes; Direct Boxes; Cue Boxes; Cable Testers

D J's Pro Audio, 7009 W. Ogden, Berwyn, IL, 60402 (312-863-7400) IL, IN, WI, Amplifiers; Consoles, Recording & Sound Reinforcement; Equalizers; Loudspeakers, Studio & S.R.; MIDI Devices & Samplers; N.R. System; Tape; Signal Processors; Synthesizers & Keyboards; Tape Machines, Analog; Time Code Synchronizers; Music Software

Flores Music & Electronics, 922 E. War Memorial, Peoria, IL, 61614 (309-682-4553) IL, Amplifiers; Consoles, Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement; Microphones & Access.; MIDI Devices; Noise Reduction Systems; Recording Tape; Signal Processors; Tape Machines, Analog; Test & Measurement Equip.

Halls Music, 204 N. Logan Ave., Danville, IL, 61832 (217-446-7450) IL, IN, Amplifiers; Consoles, Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Access.; Recording Tape; Signal Processors; Synthesizers & Keyboards

Heil Sound, #2 Heil Drive, Marissa, IL, 62257 (618-295-3000) USA, Canada, England, Consoles; Amplifiers; Sound Reinforcement Speakers; Microphones; Satellite Receiving Systems; Headsets/Boomsets

Milam Audio Co., 1470 Valle Vista, Pekin, IL, 61554 (309-346-3161) USA, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Editing Systems; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Access.; MIDI Devices & Sound Samplers; Noise Reduction Systems; Recording Tape; Signal Processor; Synthesizers & Keyboards; Tape Duplication; Tape Machines, Analog & Digital; Test & Measurement Equip.; Time Code Synchronizers

New Horizons Electronic Marketing, 2211 Lakeside Drive, Bannockburn,

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Pyramid Audio Inc., 450 W. Taft Drive, South Holland, IL, 60473 (312-339-8014) AR, IL, IN, IA, KS, KY, MI, MN, MO, NE, ND, OH, SO, WI, Amplifiers; Consoles-Recording, Production & Sound Reinforcement; Editing Systems; Equalizers; Loudspeakers-Sound Reinforcement & Studio Monitors; Microphones, MIDI; Noise Reduction; Recording Tape; Signal Processors; Synthesizers & Keyboards; Tape Duplication; Tape Machines Analog & Digital; Time Code Synchronizers

Roselle Music Inc., 217 E. Irving Park, Roselle, IL, 60172 (312-529-2031) IL, Amplifiers, Consoles, Sound Reinforcement, Recording & Production; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Access.; MIDI Devices & Sound Samplers; Recording Tape; Noise Reduction Systems; Signal Processors; Synthesizers & Keyboards; Tape Machines, Analog & Digital

Rowe Marketing, 727 N. Hudson, Suite 201, Chicago, IL, 60610 (312-664-3755) IL, IN, MN, WI, MIDI Devices & Sound Samplers; Time Code Synchronizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Editing Systems (DAT); Microphones

Sound Core Music, 715 S. University, Carbondale, IL, 62901 (618-457-5641) IL, IN, MO, KY, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Editing Systems; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Access.; MIDI Devices & Sound Samplers; Noise Reduction Systems; Recording Tape; Signal Processors; Synthesizers & Keyboards; Tape Duplication; Tape Machines, Analog & Digital; Test Measurement Equip.; Time Code Synchronizers

Studio-Sonics Corp., 1165 Tower Road, Schaumburg, IL, 60173 (312-843-7400) IL, IN, IA, KS, MI, MN, MO, OH, WI, Amplifiers; Consoles, Recording & Production;

Equalizers; Loudspeakers, Studio Monitoring; Microphones & Acces.; Noise Reduction Systems; Signal Processors; Tape Machines Analog-Tape Machines, Digital; Time Code Synchronizers; Cable & Connectors

Tek Media Supply Co., 4700 W. Chase Ave., Lincolnwood, IL, 60646 (312-677-3000; 800-323-7520) National, Video/Film Supplies & Acces.; Storage Systems

Video Basics, Inc., 1220 Richards St., Joliet, IL, 60433 (815-726-6411) IL, IN, WI, Editing Systems; Microphones & Acces.; Video Production Equipment Sales; Cases

INDIANA

AIM Marketing Group, Inc., 2025 Trailridge N., Mishawaka, IN, 46544 (219-256-2025; Fax 219-256-0501) MI, Amplifiers; Consoles, Sound Reinforcement, Recording & Production; Equalizers; Loudspeakers, Sound Reinforcement; Microphones & Acces.; MIDI Devices & Sound Samplers; Noise Reduction Systems; Recording Tape; Signal Processors; Tape Duplication; Tape Machines, Analog; Time Code Synchronizers

Allied Broadcast Equipment, 3712 National Road W., Richmond, IN, 47374 (317-962-8596) USA & Canada, Amplifiers; Consoles, Sound Reinforcement, Recording & Production; Editing Systems; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; Noise Reduction Systems; Recording Tape; Signal Processors; Tape Duplication; Tape Machines,

Analog & Digital; Test & Measurement Equipment; Time Code Synchronizers

Fox Electronics Co. Inc., 711 S. Ninth St., Richmond, IN, 47374 (317-935-7343) IN, KY, MI, OH, Amplifiers; Consoles, Sound Reinforcement; Editing Systems; Equalizers; Loudspeakers, Sound Reinforcement; Microphones & Acces.

Greencastle Music Center, 500 N. Jackson St., Greencastle, IN, 46135 (317-653-3916) IN, Amplifiers; Consoles, Sound Reinforcement; Equalizers; MIDI Devices; Synthesizers & Keyboards; Signal Processor; Loudspeakers, Sound Reinforcement

IRC Audio Inc., 8112 Castleway Court W., Indianapolis, IN, 46250 (317-849-6887) IL, IN, KY, MI, OH, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Equalizers; Loudspeakers Sound Reinforcement & Studio Monitoring; Microphones & Acces., MIDI; Noise Reduction Systems, Recording Tape; Signal Processors; Tape Machines Analog; Test & Measurement Equip.; Time Code Synchronizers

Starin Marketing, 56 E. Oak Hill Road, Chesterton, IN, 46304 (219-929-4127) IL, IN, KY, MN, ND, SD, WI, Equalizers; Tape Machines, Analog & Digital; Consoles; Microphones & Acces.; Tape Duplication

Tipton Sound & Lighting, 950 S. White River Parkway W. Drive, Indianapolis, IN, 46221 (317-631-2703) IL, IN, KY, MI, OH, Amplifiers; Consoles, Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement; Microphones & Acces.; Signal Processors; Stage Lighting Equip.; Road Cases; Disco Lighting Equip.

IOWA

Audiovisual, Inc., 415 S.W. Eighth St., Des Moines, IA, 50309 (515-282-4800) IA, MT, NE, ND, SD, WY, Amplifiers; Consoles; Editing Systems, Equalizers; Loudspeakers; Microphones & Acces.; Tape Machines, Analog

Rondinelli Music/Audio, 3250 Dodge St., Dubuque, IA, 52001 (319-583-8271) IL, IA, WI, Ship anywhere by mail order, Amplifiers; Signal Processors; Synthesizers & Keyboards; Tape Machines, Analog; Consoles, Recording & Sound Reinforcement; Equalizers; Loudspeakers; Sound Reinforcement & Studio; Microphones & Acces.; MIDI Devices & Sound Samplers; Guitars; Rentals

KANSAS

McClelland Sound, Inc., 345 N. Ohio, Wichita, KS, 67214 (316-265-8686) KS, OK, Amplifiers; Consoles, Sound Reinforcement, Recording & Production; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; Signal Processors; Test & Measurement Equip.

Mission Electronics Inc., 9301 West 74th St., Shawnee Mission, KS, 66204 (913-362-1485) KS, MO, NE, Amplifiers; Consoles; Editing Systems, Loudspeakers; Microphones & Acces.; Noise Reduction Systems; Recording Tape; Signal Processors; Tape Duplication; Tape Machines, Analog; Test & Measurement Equip.; Time Code Synchronizers

KENTUCKY

Denny Heglin Music Inc., 734 Madison Ave., Covington, KY, 41011 (606-491-6600) IN, KY, OH, Amplifiers; Consoles, Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement; Microphones & Acces.; Noise Reduction Systems; Signal Processors

Willcutt Guitar Shoppe, Inc., 419 Rosemont Garden, Lexington, KY, 40503 (606-276-2713) KY, Amplifiers; Consoles, Sound Reinforcement, Recording & Production; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; MIDI Devices & Sound Samplers; Noise Reduction Systems; Recording Tape; Signal Processors; Synthesizers & Keyboards; Tape Machines, Analog

LOUISIANA

Propaganda Production Ltd., 5609-A Crawford St., Harahan, LA, 71023 (504-733-8211; Fax 504-733-4532) FL, LA, MS, TX, Amplifiers; Consoles, Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; Recording Tape; Signal Processors

Shreveport Music Co. Inc., 1610 E. Bert Kouns, Shreveport, LA, 71105 (318-798-6000; 318-797-MIDI) AR, LA, TX, Amplifiers; Consoles Recording & Sound Reinforcement; Equalizers; Loudspeaker, Sound Reinforcement & Studio; Microphones; MIDI Devices; Noise Reduction Systems; Signal Processors; Synthesizers

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Specialty Sound Co. Inc., P.O. Box 4139, Monroe, LA, 71211 (318-387-3628) LA, Amplifiers; Consoles, Sound Reinforcement; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; MIDI Devices & Sound Samplers; Signal Processing; Synthesizers & Keyboards; Tape Machines, Analog

MARYLAND

Audio Maintenance Services, P.O. Box 2072, Montgomery Village, Gaithersburg, MD, 20879 (301-540-6656) DC, MD, VA, Amplifiers; Consoles, Sound Reinforcement, Recording & Production; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Noise Reduction Systems; Recording Tape; Signal Processors; Tape Machines, Analog; Test & Measurement Equip.

Avtecs, 619 Hungerford Drive, Rockville, MD, 20850 (301-279-2500) DC, MD, VA, Amplifiers; Consoles; Editing Systems; Equalizers; Noise Reduction; Signal Processors; Tape Duplication; Recorders Analog & Digital

Gordon Miller Music Inc., 8805 Orchard Tree Lane, Towson, MD, 21204 (301-825-2558) MD, Amplifiers; Consoles, Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; MIDI Devices & Samplers; Noise Reduction; Recording Tape; Signal Processors; Synthesizers & Keyboards; Tape Machines, Analog

MASSACHUSETTS

AVR Group, 5 Walnut Terrace, Newton, MA, 02160 (617-332-1441) Worldwide, Amplifiers; Consoles, Sound Reinforcement, Recording & Production; Editing Systems; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; MIDI Devices; Noise Reduction; Tape; Signal Processors; Synthesizers; Tape Machines, Analog & Digital; Test Equip.; Time Code Synchronizers

Barnstorm Music, 167 Main St., Milford, MA, 01757 (508-473-9802) MA, Amplifiers; Loudspeakers, Sound Reinforcement; Microphones & Acces.; MIDI Devices; Signal Processors; Synthesizers & Keyboards

Boston Light & Sound Inc., 124 Brighton Ave., Allston, MA, 02134 (617-787-3131) CT, ME, MA, NH, RI, VT, Amplifiers; Consoles, Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement

& Studio Monitors; Microphones & Acces.; Signal Processors

CYNC Corp., 1482 Beacon St., Brookline, MA, 02146 (617-277-4317) CT, ME, MA, NY, VT, Amplifiers; Consoles, Sound Reinforcement, Recording & Production; Editing Systems; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; MIDI Devices; Noise Reduction; Tape; Signal Processing; Synthesizers; Tape Duping; Tape Machines, Analog & Digital; Test Equip.; Time Code Equip.; Television Location Equip.; TV Studio Equip.

Downtown Sounds, Inc., 21 Pleasant St., Northampton, MA, 01060 (413-586-0998) MA, Amplifiers; Microphones; MIDI Devices; Signal Processors; Synthesizers & Keyboards; Tape Machines, Analog

E.A.R.S., Inc., 300-R Putnam Ave., Cambridge, MA, 02139 (617-547-1750) USA, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; MIDI Devices & Sound Samplers; Noise Reduction Systems; Signal Processors; Time Code Synchronizers; Transformers

Lake Systems Corp., 287 Grove St., Newton, MA, 02166 (617-244-6881) CT, DC, ME, MD, MA, NH, NJ, NY, PA, RI, VT, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Equalizers; Loudspeakers, Studio Monitoring & Sound Reinforcement; Microphones & Acces.; MIDI Devices & Sound Samplers; Noise Reduction Systems; Recording Tape; Signal Processors; Tape Machines, Analog & Digital; Time Code Synchronizers

Music Designers, Inc./Precision Motor Works, 241 White Pond Road, Hudson, MA, 01749 (617-562-4420) USA, Microphones & Acces.; Tape Machines, Analog; Cleaning Fluids; Motor Servicing & Rebuilding

Professional Audio Associates Inc., 170 Cambridge St., Burlington, MA, 01803 (617-229-6050) New England States; Upstate NY, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Editing Systems; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; MIDI Devices; Noise Reduction Systems; Recording Tape; Signal Processors; Tape Duplication; Test & Measurement Equip.; Time Code Synchronizers

Star Systems, 462 Merrimack St., Methuen, MA, 01844 (508-794-9399) CT, ME, MA, NH, RI, VT, Amplifiers; Consoles, Recording,

Production & Sound Reinforcement; Editing Systems; Equalizers, Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; MIDI Devices & Sound Samplers; Noise Reduction; Recording Tape; Signal Processors; Synthesizers, Analog Tape Machines, Time Code Synchronizers

MICHIGAN

Advanced Lighting & Sound, 40375 Dequindre Road, Troy, MI, 48098 (313-528-3113) MI, Amplifiers; Consoles, Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement; Microphones; Signal Processing

The Audio Broadcast Group, Inc., 2342 S. Division Ave., Grand Rapids, MI, 49507 (616-452-1596) USA, Amplifiers; Consoles, Recording & Production; Equalizers; Loudspeakers, Studio Monitoring; Microphones; Noise Reduction; Tape Machines, Analog; Studio Furniture

Cooks Music, 615 N. Mission, Mount Pleasant, MI, 48858 (517-772-2455) MI, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Editing Systems; Equalizers; Loudspeakers, Sound Reinforcement, & Studio Monitoring; Microphones & Acces.; MIDI Devices & Sound Samplers; Noise Reduction Systems; Recording Tape; Signal Processors; Synthesizers & Keyboards; Tape Duplication, Tape Machines, Analog; Test & Measurement Equip.; Time Code Synchronizers

ElectroMedia Services, Inc., 24166 Haggerty Road, Farmington Hills, MI, 48024 (313-477-6502) IN, MI, OH, Amplifiers; Consoles, Sound Reinforcement, Recording & Production; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Noise Reduction Systems; Signal Processors; Tape Duplicators; Tape Machines, Analog & Digital

FiFe-Pearce Electric Co., 17141 Ryan Road, Detroit, MI, 48212 (800-521-1062) Nationwide, Tape Eraser Equip. Video/Audio

General Television Network, 13201 Capitol Ave., Oak Park, MI, 48237 (313-399-2000) MI, OH, Amplifiers; Consoles, Recording & Production; Editing Systems; Equalizers; Loudspeakers, Studio Monitoring; Microphones & Acces.; Recording Tape; Signal Processors; Tape Machines, Analog & Digital; Time Code Synchronizers

Hy James - The Audio Professionals, 24166 Haggerty, Farmington Hills, MI, 48024 (313-471-0027) IL,

IN, MI, OH, WI, Consoles; Tape Recorders; Cartridge Machines; CD Players; Microphones; Direct Boxes; Speakers; Amplifiers; Reverberation; Signal Processing; Equalization; Noise Reduction; TT & Cartridges; Intercoms; Telephone Interfaces; Headphones; Recording Tape; Film & Video; Clock Systems; SMPTE Time Code/MIDI; Test Equip.; RF; Accessories

Key Marketing, Inc., 44808 Helm St., Plymouth, MI, 48170 (313-459-6040) MI, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; MIDI Devices; Signal Processing; Tape Machines, Analog; Time Code Synchronizers

Milks Copier Products, 12009 N. Saginaw St., Mount Morris, MI, 48458 (313-686-8120; 313-686-1866) USA, Amplifiers; Consoles, Sound Reinforcement, Recording & Production; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; Recording Tape; Tape Duplication; Tape Machines, Analog

The Music Castle, Inc., 34 S. Telegraph, Pontiac, MI, 48053 (313-682-0544) MI-primarily metro Detroit & surrounding area, Amplifiers; Consoles, Sound Reinforcement; Loudspeakers, Sound Reinforcement; Equalizers; Microphones & Acces.; Noise Reduction Systems; Signal Processors; Tape Machines, Analog

The Music Castle, Inc., 1418 N. Woodward, Royal Oak, MI, 48067 (313-543-5070) MI-primarily metro Detroit & surrounding area, Amplifiers; Consoles, Sound Reinforcement; Loudspeakers, Sound Reinforcement; Equalizers; Microphones, Acces.; Noise Reduction Systems; Signal Processors; Tape Machines, Analog

Pro Co Sound, Inc., 135 E. Kalamazoo Ave., Kalamazoo, MI, 49007 (800-253-7360; 616-388-9675; Fax 616-388-9681) USA, Connectors; Adapters; Floor Pockets

Sound Good Audio, Inc., 2222 Spikes Lane, Lansing, MI, 48906 (517-372-5278; Fax 517-372-1871) USA & Canada, Amplifiers; Consoles, Sound Reinforcement, Recording & Production; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; Signal Processing; Tape Machines, Analog; Video Wall

Synder Systems, 16640 E. Warren Ave., Detroit, MI, 48224 (313-881-5167) MI, Amplifiers;

Consoles (Live & Studio); Equalizers; Speakers (Studio & Live); Microphones & Access.; MIDI Devices & Checkers; Noise Reduction; Tape; Signal Processors; Synthesizers & Keyboards; Tape, Analog; Studio Lighting

MINNESOTA

AVC Systems Div. of Vaughn Communications Group, 7901 Computer Ave. S., Minneapolis, MN, 55435 (612-831-3435) IL, IA, MI, MN, ND, SD, WI, Amplifiers; Consoles, Sound Reinforcement, Recording & Production; Editing Systems; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Access.; MIDI Devices & Sound Samplers; Noise Reduction Systems; Recording Tape; Signal Processors; Synthesizers & Keyboards; Tape Machines, Analog & Digital; Test & Measurement Equip.; Time Code Synchronizers; Video-tape Duplication

Eclipse Concert Systems, Inc., 153 E. Thompson Ave., West St. Paul, MN, 55118 (612-451-8878) IA, MN,

MT, ND, SD, WI, Amplifiers; Consoles, Sound Reinforcement, Recording & Production; Equalizers; Loudspeakers, Sound Reinforcement, Studio Monitoring; Microphones & Access.; MIDI Devices & Sound Samplers; Noise Reduction Systems; Recording Tape; Signal Processors; Tape Machines, Analog; Time Code Synchronizers; Cable; Rigging; Musical Instruments; Lighting

Garceau Music & Radio Shack, 24 W. Main St., Crosby, MN, 56441 (218-546-5523) MN, MIDI Hardware, Software & Consulting; Computers; Keyboards

Marguerite's Music, 2409 10th St. S., Moorhead, MN, 56560 (218-233-7546) MN, MT, ND, SD, Amplifiers; Consoles, Recording & Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement; Microphones & Access.; MIDI Devices & Sound Samplers; Noise Reduction Systems; Recording Tape; Synthesizers & Keyboards; Tape Machines, Digital

North Star Sound, Inc., 1406 First Ave. S., Minneapolis, MN, 55403

(612-871-6016) MN, Amplifiers; Consoles, Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Access.; Noise Reduction Systems; Signal Processors; Wireless Microphones; Stage Intercom.

Southern Thunder Sound, Inc., 212 Third Ave. N., Minneapolis, MN, 55401 (612-339-6303) IA, MN, ND, SD, WI, Loudspeakers, Sound Reinforcement; Signal Processors; Rigging; Amplifiers; Equalizers; Acoustic Design & Construction; Microphones & Access.; Amplifiers; Consoles, Sound Reinforcement

Yore Co., 3564 Rolling View Drive, White Bear Lake, MN, 55110 (612-770-9760) MN, ND, SD, West-WI, Amplifiers; Consoles, Recording, Production, & Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Access.; MIDI Devices & Sound Samplers; Noise Reduction Systems; Signal Processors; Tape Machines, Analog; Test & Measurement Equip.; Intercom; School Intercom Telco

Equip.

MISSOURI

Antech Labs, Inc., 11118 Olive St. Road, St. Louis, MO, 63141 (314-997-5666; 800-325-1960) AR, IL, IA, KS, MO, NE, OK, Amplifiers; Consoles, Sound Reinforcement, Recording & Production; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Access.; Signal Processors; Noise Reduction Systems; Recording Tape; Tape Duplication; Tape Machines, Analog; Time Code Synchronizers

Paradise Sight & Sound, 1620 S. Broadway, St. Louis, MO, 63104 (314-421-1211) FL, GA, IL, MA, MO, VI, Amplifiers; Consoles, Recording & Production; Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement; Recording Microphones & Access.; Noise Reduction; Recording Tape-Signal Processors; Tape Machines, Analog; Time Code Synchronizers

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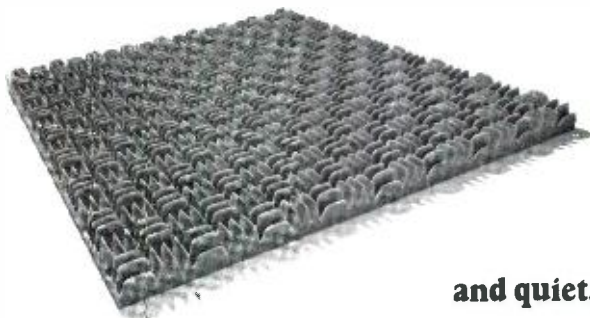
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Midwest Sound & Lighting, Inc., 2324 O St., Lincoln, NE, 68510 (402-474-4918) IA, KS, MO, NE, SD, Amplifiers; Consoles, Recording, Production and Sound Reinforcement; Editing Systems; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.: MIDI Devices & Sound Samplers; Noise Reduction Systems; Recording Tape; Signal Processors; Synthesizers & Keyboards; Tape Duplication; Tape Machines, Analog; Test & Measurement Equip.

Midwest Sound & Lighting, Inc., 308 South 72nd St., Omaha, NE, 68114 (402-399-8028) IA, KS, MO, NE, SD, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Editing Systems; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; MIDI Devices & Sound Samplers; Noise Reduction Systems; Recording Tape; Signal Processors; Synthesizers & Keyboards; Tape Duplication; Tape Machines, Analog; Test & Measurement Equip.

Steve's Microphones, 13203 Carpenter St., Omaha, NE, 68138 (402-895-6434) NE, Recording Tape; Microphones & Acces.; Equip. Cases; Rental

NEW HAMPSHIRE

Interface, 660 S. Main St., Keene, NH, 03431 (603-357-5040) ME, MA, NH, VT, Amplifiers; Equalizers; Loudspeaker SR & Monitor; Microphones; Recording Tape; Tape Machines, Analog

Promusica Sales, 82 Washington St., Keene, NH, 03431 (603-352-4831) CT, ME, MA, NH, NJ, NY, RI, VT, Amplifiers; Consoles, Recording & Sound Reinforcement; Equalizers, Loudspeakers; Microphones; MIDI Devices; Signal Processors; Test & Measurement Equip.; Software

NEW JERSEY

Audio International, 424 Grant Ave., Scotch Plains, NJ, 07076 (201-322-4466) NJ, NY, PA, Amplifiers; Consoles, Sound Reinforcement, Recording & Production; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones; Noise Reduction Systems; Signal Processors

Creative Audio Services, 126 W. Cliff St., Somerville, NJ, 08876 (201-685-0330) NJ, NY, PA, Amplifiers; Consoles, Sound Reinforcement, Recording & Production;

Equalizers; Loudspeakers, Sound Reinforcement; Microphones & Acces.; Signal Processors

Gabriel Sound, 400 Union Ave., Haskell, NJ, 07420 (201-835-5004) CT, NJ, NY, Amplifiers; Mikes; Stands; Speakers; Speaker Cabinets; Servo-Bass; Flight Cases; Processing; Consoles; Complete Tour Packaging; Custom Multi-Pin Work; Speaker Reconciling & Electronic Maintenance; Sound Systems & Backline Equip. Rentals

Impact Audio, 175 Hornblower Ave., Belleville, NJ, 07109 (201-759-0261) CT, NJ, NY, Amplifiers; Consoles Recording, Production & Sound Reinforcement; Equalizers; Loudspeakers Sound Reinforcement & Studio Monitoring; Signal Processors; Flight Cases

JRF Magnetic Sciences, 249 Kennedy Road, Greendell, NJ, 07839 (201-579-5773) USA, Magnetic Recording Heads; Sales & Service; Time Code Synchronizers

Noise Unlimited, Inc., 104 S. Bridge St., Somerville, NJ, 08889 (201-725-1700) CA, CT, DE, DC, IL, IN, ME, MD, MA, MI, MN, MO, NH, NJ, NY, NC, OH, OK, PA, TX, VT, VA, WA, Acoustical Testing, Consulting & Engineering

Professional Audio Video Corp., P.O. Box 14, Towaco, NJ, 07082 (201-523-3333) USA, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; Noise Reduction Systems; Recording Tape; Signal Processing; Tape Machines, Analog

Pusecker Sales, 372 Upper Mountain Ave., Upper Montclair, NJ, 07043 (201-744-1834) CT, NJ, NY, Amplifiers; Consoles, Sound Reinforcement, Recording & Production; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones; MIDI Devices; Signal Processors

Peter E. Schmitt Co., Inc., 240 Grand Ave., Leonia, NJ, 07605-0334 (201-944-2806) NJ, NY, Amplifiers; Consoles, Recording & Production; Equalizers; Loudspeakers Sound Reinforcement; Microphones & Accessories; Digital Reverbs; Aural Exciters, Speakers

Sim-O-Rama Sound, 572 Union Blvd., Totowa, NJ, 07512 (201-790-6772) NJ, NY, Amplifiers; Consoles, Sound Reinforcement, Recording & Production; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; Recording Tape; Signal Processors; Tape Machines, Analog & Digital; Disco Equip. Including

Turntables, Compact Disc Players, Mixers, Console Cases & Equip. Cases

NEW MEXICO

Dyma Engineering, Inc., P.O. Box 1535, Los Lunas, NM, 87031 (505-865-6700) AZ, CO, KS, NM, OK, TX, UT, Amplifiers; Consoles, Sound Reinforcement, Recording & Production; Editing Systems; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Access; Noise Reduction Systems; Signal Processors; Tape Machines, Analog; Test & Measurement Equip.; Time Code Synchronizers; Compact Disc Players; AC Surge Protectors; Video Equip.

King Broadcasting Co., Inc., P.O. Box 2308, Roswell, NM, 88201 (505-623-9100) NM, Tape Machines, Analog; Amplifiers

NEW YORK

Acoustilog, Inc., 19 Mercer St., New York, NY, 10013 (212-925-1365) CT, NJ, NY, Consoles, Recording & Production; Microphones & Acces.; Recording Tape; Signal Processors

Alex Musical Instruments, Inc., 164 West 48th St., New York, NY, 10036 (212-819-0070) USA, Amplifiers, Consoles, Recording, Production & Sound Reinforcement; Editing Systems, Equalizers, Loudspeakers, Sound Reinforcement & Studio Monitoring, Microphones & Acces., MIDI Devices & Sound Samplers, Recording Tape; Signal Processors, Synthesizers & Keyboards, Tape Duplication, Tape Machines, Analog; Time Code Synchronizers; Video, MIDI Computer Software

Applied Audio, 315 Mt. Read Blvd., Rochester, NY, 14611 (716-436-8475) NY, Amplifiers; Consoles, Sound Reinforcement, Recording & Production; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Access; MIDI Devices; Noise Reduction Systems; Recording Tape; Signal Processors; Tape Duplication; Tape Machines, Analog & Digital; Test & Measurement Equip.; Lighting Special Effects Video

AST Sound, 250 W. Broadway, New York, NY, 10013 (212-226-7781) CT, NJ, NY, Amplifiers; Consoles, Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; MIDI Devices & Sound Sampling; Noise Re-

duction Systems; Signal Processors; Tape Machines, Analog; Loudspeaker Repairs

Audio Classics, P.O. Box 176, Walton, NY, 13856 (607-865-7200) Worldwide, We Buy, Sell & Trade all Brands of Audio Equip.; Amplifiers; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Test & Measurement Equip.

Aura Sonic Ltd, P.O. Box 791, Flushing, NY, 11352-0791 (718-886-6500) USA, Cable, Connectors; Compressors; Crossovers & Frequency Dividers; Delays; Equalizers; Rentals; Limiters; Microphones; Noise Gates; Patch Bays; Recording Tape Audio & Video; Reverb Units; Signal Processors, Samplers

AVS Systems (Audio Video Security Systems), 3773 Arthur Ave., Seaford Long Island, NY, 11783 (516-679-2105) CT, NJ, Metro-NY, Amplifiers; Loudspeakers; Equalizers; Tape Machines Analog & Digital; CCTV; Intercom Systems; Telephone Systems; Alarm Systems; Media Rooms; Small Studios

Bi-Tronics, P.O. Box 125, Tuckahoe, NY, 10707 (800-522-7377; 914-793-3221) North America, Connectors; Cable; Cable Assemblies; Adaptors for Audio; Video & Data Applications

BJM Electronics Ltd., 2008 Victory Blvd., Staten Island, NY, 10314 (718-442-0223; 800-342-5256) USA, Microphones & Acces.; Recording Tape; Test & Measurement Equip.; Cables & Connectors; Patching Systems; Cleaning & Maintenance Supplies

Brighton Sound, Inc., P.O. Box 60977, Lyell Station, Rochester, NY, 14606 (716-328-1220) NY, PA, Amplifiers; Consoles, Recording Production & Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; MIDI Devices & Sound Samplers; Recording Tape; Signal Processor; Synthesizers & Keyboards, Tape Machines, Analog; Time Code Synchronizers

Burlington Audio/Video Tapes, Inc., 106 Mott St., Oceanside, NY, 11572 (516-678-4414; 800-331-3191) Worldwide, Recording Tape & Accessories (Audio & Video)

Camera Mart Inc., 456 West 55th St., New York, NY, 10019 (212-757-6977) CA, CT, DE, IN, MD, MA, NV, NJ, NY, OR, PA, RI, VT, WA, Amplifiers; Editing Systems; Equalizers; Loudspeakers & Studio Monitoring; Microphones & Acces.; Recording Tape; Signal Processors; Tape Machines, Analog & Digital; Time Code Synchronizers

Colotti Enterprises, P.O. Box 639, Le-wittown, NY, 11756 (516-221-0974) Nationwide, Hard Drives; Modems; Tape Back Ups

CSE Audio, 1200-A Scottsville Road, Rochester, NY, 14624 (716-436-9830) CT, ME, MD, NH, NY, OH, PA, VT, VA, WV, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Editing Sys-tems; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Access.; MIDI Devices & Sound Samplers; Noise Reduction Systems; Recording Tape; Signal Processors; Synthesiz-ers & Keyboards; Tape Duplication; Tape Machines, Analog & Digital; Test & Measurement Equip.; Time Code Synchronizers

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Dalbec Audiolab, Red Mill Road, Renss-elaer, NY, 12144 (518-477-7873) CT, ME, MA, NJ, NY, PA, VT, Amplifiers; Consoles, Sound Rein-forcement, Recording & Production; Equalizers; Loudspeakers, Sound Reinforcement & Monitoring; Micro-phones & Access.; Test & Measure-ment Equip.; Signal Processors

Eastern Standard Productions, Inc., 26 Baxter St., Buffalo, NY, 14207 (716-876-1454; 800-527-9225) Nationwide, Canada, Eng-land, France, Blank Audio & Video Cassettes, Vinyl Folder Audio & Video; Video Boxes

Erskine-Shapiro Theatre Technology Inc., 37 West 20th St., Suite 703, New York, NY, 10011 (212-929-5380) USA, Amplifiers; Con-soles, Sound Reinforcement; Equal-izers; Loudspeakers, Sound Reinforcement; Microphones & Ac-cess.; Signal Processors; Tape Du-plication; Tape Machines, Analog; Intercom

Glenart Audio & Video, 9 Melony Ave., Plainview, NY, 11803 (516-937-0583; 212-847-8057) CT, NJ, NY, PA, Consoles; Amplifiers; Equalizers; Loudspeakers, Rein-forcement; Microphones & Access.; Recording Tape; Signal Processors; Tape Machines, Analog; Time Code-Generators & Readers; Motion Pic-ture Resolvers; Video Tape Recording For Use With Film; Video Frame Matching For Film

Gotham Audio Corp., 1790 Broadway, New York, NY, 10019-1412 (212-765-3410) North America, Consoles, Recording & Production; Equalizers; Loudspeakers, Studio Monitoring; Microphones & Access-; Signal Processors; Tape Machines, Analog & Digital; Test & Measure-ment Equip.; Time Code Synchron-izers

Manny's Music/Professional Audio Div., 156 West 48th St., New York

City, NY, 10036 (212-819-0576) CT, MA, NJ, NY, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Editing Sys-tems; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces-; MIDI Devices & Sound Samplers; Noise Reduction Systems; Recording Tape; Signal Processors; Synthesiz-ers & Keyboards, Tape Duplication; Tape Machines, Analog & Digital;

Test & Measurement Equip.; Time Code Synchronizers

Markertek Video Supply, 145 Ulster Ave., Saugerties, NY, 12477 (800-522-2025; 914-246-3036) USA & Canada, Amplifiers; Microphones & Access.; Recording Tape; Acoustic Foam Cables; Con-nectors; Labels; Test Equip.; Tools

Martin Audio Video Corp., 423 West 55th St., New York, NY, 10019

(212-541-5900) CT, DE, DC, ME, MD, MA, NH, NJ, NY, PA, RI, VT, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Editing Systems; Equalizers; Loud-speakers, Sound Reinforcement & Studio Monitoring; Microphones & Accessories; MIDI Devices & Sound Samplers, Noise Reduction Systems; Recording Tape; Signal Processors; Synthesizers & Keyboards, Tape Du-plication; Tape Machines, Analog &

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Merimack Sound, 901 Monroe Ave., Rochester, NY, 14620 (716-442-5050) NY, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Editing Systems; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; MIDI Devices & Sound Samplers; Noise Reduction Systems; Recording Tape; Signal Processors; Synthesizers & Keyboards; Tape Duplication; Tape Machines, Analog & Digital; Test & Measurement Equip.; Time Code Synchronizers

L. Matthew Miller Associates Ltd., 48 West 21st St., New York, NY, 10010 (212-741-8011) USA, Canada, Europe, South America, Video Recording; Video Editing Systems; Microphones, Video Tape, Video Tape Duplication Machines; Test & Measurement Equip. For Video, Video Time Code Machines

Mineroff Electronics, Inc., 574 Meacham Ave., Valmont, NY, 11003 (516-775-1370) Nationwide, Amplifiers; Recording; Equalizers; Loudspeakers; Microphones & Acces.; Recording Tape; Tape Duplication; Tape Machines

Multi-Sonus Inc., 87 N. Clinton Ave., Suite 412, Rochester, NY, 14604 (716-325-3006) IL, ME, MD, MA, NH, NJ, NY, PA, RI, VT, Canada, Loudspeakers, Sound Reinforcement & Studio Monitors

Posthorn Recordings, 142 West 26th St., New York, NY, 10001 (212-242-3737) NY, Amplifiers; Consoles; Recording & Production; Equalizers; Microphones; Recording Tape; Signal Processors; Test & Measurement

Studio Consultants, Inc., 321 West 44th St., New York, NY, 10036 (212-586-7376) CT, DE, DC, ME, MD, MA, NH, NJ, NY, PA, PR, RI, VT, Amplifiers, Consoles, Recording & Production; Equalizers; Loudspeakers, Studio Monitoring; Sound Samplers; Recording Tape, Signal Processors, Time Code Synchronizers; Hard Disk Based Digital Recording & Editing Systems; Microphones & Access.

Success Specialty Sales Corp., P.O. Box 77, Rockville Centre, NY, 11570 (516-798-2311) USA, Splicing Tapes; Packaging Products Audio & Video

Unistage, Inc., 330 Genesee St., Buffalo, NY, 14204 (716-853-6500) West-NY, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones &

Acces.; Noise Reduction Systems; Signal Processors; Synthesizers & Keyboards; Tape Machines, Analog; Time Code Synchronizers

Whirlwind Audio Inc., 100 Boxart St., Rochester, NY, 14612 (716-865-4415) West-NY, Amplifiers; Consoles-Sound Reinforcement, Recording & Production; Equalizers; Loudspeakers-Studio Monitoring & Sound Reinforcement; Microphones & Noise Reduction Systems; Signal Processors; Tape Machines-Analog & Digital; Synthesizers & Keyboards; Test & Measurement Equip.; Time Code Synchronizers

NORTH CAROLINA

Applied Audio Marketing, 9 Elk Mountain Road, Asheville, NC, 28804-2105 (704-252-9313; 800-999-9313) AL, GA, MS, NC, SC, TN, Consoles, Sound Reinforcement, Recording & Production; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; MIDI Devices & Sound Samplers; Signal Processors; Synthesizers & Keyboards; Tape Duplication; Tape Machines, Analog & Digital; Time Code Synchronizers

Associated Sound Products Inc., 3900 Tarheel Drive, Raleigh, NC, 27609 (919-878-0044) MD, NC, VA, Consoles, Sound Reinforcement, Recording & Production; Equalizers; Amplifiers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Noise Reduction Systems; Microphones & Acces.; Signal Processors; Tape Machines, Analog; Time Code Synchronizers

Reliable Music, 650 E. Stonewall St., Charlotte, NC, 28202 (704-375-8662) FL, GA, NC, SC, VA, WV, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Editing Systems; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; MIDI Devices & Sound Samplers; Noise Reduction Systems; Recording Tape; Signal Processors; Synthesizers & Keyboards, Tape Duplication; Tape Machines, Analog & Digital; Test & Measurement Equip.; Time Code Synchronizers

Studioworks Recording & Broadcast Equipment, 1018 Central Ave., Charlotte, NC, 28204 (704-375-1053; 800-438-5921) CA, FL, GA, LA, MA, MO, NJ, NY, NC, OH, SC, TN, TX, VA, WA, Recording Tape; Microphones & Acces.; Equalizers; Consoles, Recording & Production; Tape Duplication; Tape Machines, Analog & Digital; Loud-

speakers, Studio Monitoring; Noise Reduction Systems

Tri-Tronics Professional Electronics, P.O. Box 1055, Lillington, NC, 27546 (919-893-4183) NC, Amplifiers; Consoles, Sound Reinforcement, Recording & Production; Equalizers; Loudspeakers, Sound Reinforcement, Studio Reinforcement; Microphones & Acces.; Signal Processors; Wireless Microphones

Wyco Sales, P.O. Box 887, Cary, NC, 27512 (919-467-8113) Nationwide, Headphones & Acces.; Recording Tape - Video & Audio; Storage Systems & Carrying Cases

OHIO

Avstar/Audio Image, Inc., 909 King Ave., Columbus, OH, 43212 (614-299-2321) IN, KY, MI, OH, PA, WV, Amplifiers; Consoles, Sound Reinforcement, Recording & Production; Editing Systems; Equalizers; Loudspeakers, Sound Reinforcement, Studio Monitoring; Microphones & Acces.; MIDI Devices & Sound Samplers; Noise Reduction Systems; Recording Tape; Signal Processors; Tape Duplication; Tape Machines, Analog & Digital; Test Measurement Equip.; Time Code Synchronizers

Central Music Exchange, 11504 Lorain Ave., Cleveland, OH, 44111 (216-671-0093) IN, MI, OH, PA, Amplifiers; Consoles, Sound Reinforcement; Equalizers; Loudspeakers, Sound, Loudspeakers, Studio; Microphones & Acces.; MIDA Devices; Noise Reduction; Signal Processors; Synthesizers & Keyboards; Electronic Percussion; Consoles, Recording; Tape Machines, Analog

Hood Industries Inc., 5700 Superior Ave., Cleveland, OH, 44103 (216-431-4663) OH, Amplifiers; Consoles, Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; Signal Processors; Tape Machines, Analog

ICB Audio Co., 1349 E. McMillan St., Cincinnati, OH, 45206 (513-281-5535) IL, IN, KY, OH, PA, TN, WV, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Editing Systems; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; MIDI Devices & Sound Samplers; Noise Reduction Systems; Recording Tape; Signal Processors; Tape Duplication; Tape Machines, Analog; Test & Measurement Equip.; Time Code Synchronizers

Ohio Sound Systems, 1399 East 17th St., Cleveland, OH, 44114 (216-781-1234) OH, Amplifiers, Equalizers; Loudspeakers, Sound Reinforcement; Microphones & Acces.; Noise Reduction Systems

Pi Keyboards & Audio, 2121 Brookpark Road, Cleveland, OH, 44134 (216-741-1400) IN, KY, MI, OH, PA, Amplifiers; Consoles; Recording, Production & Sound Reinforcement; Editing Systems; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; MIDI Keyboards, Software, Devices & Sound Samplers; Noise Reduction Systems; Recording Tape; Signal Processors; Synthesizers & Keyboards; Tape Duplication; Tape Machines, Analog & Digital; Test & Measurement Equip.; Time Code Synchronizers

C.L. Pugh & Associates, Inc., 13477 Prospect Road, Suite 209, Cleveland, OH, 44136 (216-238-1777) OH, West-PA, WV, Amplifiers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.

Phil Reddish Supply, Inc. dba Phil Reddish Sound, 11725 Royalton Road, North Royalton, OH, 44133 (216-582-4333) OH, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; Noise Reduction Systems, Recording Tape; Signal Processors; Tape Duplication; Tape Machines, Analog & Digital; Time Code Synchronizers; Wireless Microphones & Intercoms; Production Intercoms; Theatre Sound Systems

Roadshow Sound, 3665 Karl Road, Columbus, OH, 43224 (614-263-3720) IN, OH, MI, PA, WV, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Equalizers; Loudspeakers; Studio Monitors; Microphones & Acces.; MIDI Devices & Sound Samplers; Synthesizers & Keyboards, Tape Machines, Analog; Time Code Synchronizers

Sound Com Corp., 227 Depot St., Berea, OH, 44017 (216-234-2604; Fax 216-234-2614) No-East-OH, Amplifiers; Consoles Sound Reinforcement, Recording & Production; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; Signal Processors; Tape Machines Analog; Wireless Microphone, Intercom & Monitoring Systems; Cable, Equip. Cabinets, Permanent Installation & Portable; Master Clock Systems

Speakers Unlimited, 3138 N. Main St., Dayton, OH, 45405 (513-275-7417) IN, KY, OH, Amplifiers; Consoles, Recording & Sound Reinforcement; Equalizers; Loudspeakers; Studio Monitors; Microphones & Acces.; MIDI Devices; Noise Reduction Systems; Recording Tape; Signal Processors; Synthesizers & Keyboards; Tape Machines, Analog; Time Code Synchronizers

Bob White Associates, P.O. Box 39104, Solon, OH, 44139 (216-248-1317; 517-592-5138) IN, KY, OH, MI, West-PA, WV, Amplifiers; Consoles, Recording & Sound Reinforcement; Equalizers; Loudspeakers; Studio Monitoring & Sound Reinforcement; Microphones; Sound Samplers; Synthesizers; Cases, Lighting Equip.; Wire

OKLAHOMA

Ford Audio-Video Systems Inc., 4800 West I-40, Oklahoma City, OK, 73128 (800-654-6744) AR, KS, LA, MO, NM, OK, TX, Amplifiers, Consoles, Recording & Sound Reinforcement, Editing Systems, Equalizers, Loudspeakers, Sound Reinforcement & Studio Monitoring; Noise Reduction Systems; Recording Tape; Signal Processors; Tape Machine, Analog & Digital, Time Code Synchronizers

OREGON

Brownell Sound & Hi Fi, Inc., 2500 S.E. Hawthorne Blvd., Portland, OR, 97214 (503-231-7866) OR, Amplifiers; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; MIDI Devices & Sound Samplers; Noise Reduction Systems; Recording Tape; Signal Processors; Synthesizers & Keyboards; Tape Machines, Analog & Digital; Test & Measurement Equip.; Time Code Synchronizers

GKM Marketing Corp., P.O. Box 1713, Lake Oswego, OR, 97305 (503-635-3531) AK, Amplifiers; Loudspeakers, Sound Reinforcement & Studio; Tape Machines, Analog; Compact Disc Players; Speaker Wire; Interconnect Cable

Inner Sound, 1818 S.E. Division, Portland, OR, 97202 (503-238-1955) OR, WA, Service/Repair of Amplifiers; MIDI Devices; Signal Processors; Synthesizers & Keyboards; Tape Machines, Analog; Tape Duplication

MIDIMIX, P.O. Box 161, Ashland, OR, 07520 (503-488-1023) No.-CA, So.-OR, MIDI Devices; Synthesizers; Accessories

Northwestern, Inc., 1224 S.W. Broadway, Portland, OR, 97205 (503-226-0170; 800-547-2252) AZ, CA, CO, KS, MT, NE, ND, NV, NM, OK, OR, SD, TX, UT, WA, Recording Tape; Tape Duplication; Tape Machine Parts

PENNSYLVANIA

Audio Innovators, Inc. dba Pro Com Systems, 5001 Baum Blvd., Pittsburgh, PA, 15213 (412-621-1950) USA for service & consultation; OH, PA, WV for sales, Amplifiers; Consoles, Recording & Production & Sound Reinforcement; Editing Systems; Equalizers; Loudspeakers Sound Reinforcement & Studio Monitoring; Microphones & Acces.; Noise Reduction Systems; Recording Tape; Signal Processors; Tape Duplication; Tape Machines, Analog; Test & Measurement Equip.

Crown Magnetics, Inc., 650 N. Sixth St., Lebanon, PA, 17042 (717-274-2812) USA, Pro Audio Equip. Sales & Service; Blank Audio Cassette Loading; Audio Cassette Duplication & Packaging

The Daveland Co., Inc., 407 Linden St., Allentown, PA, 18102 (215-439-8701) DE, NJ, PA, Amplifiers; Consoles, Sound Reinforcement, Recording & Production; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; Signal Processors; Tape Duplication; Tape Machines, Analog

Fred's Music Shop, 212 W. Lancaster Ave., Shillington, PA, 19607 (215-777-3733) Central & So. East-PA, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement; Microphones & Acces.; MIDI Devices & Sound Samplers; Signal Processors; Synthesizers & Keyboards; Tape Machines, Analog

Fred's Music (West Branch), 4511 Jonestown Road, Harrisburg, PA, 17109 (717-652-7714) Central-PA, Amplifiers; Consoles; Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement; Microphones and Acces.; MIDI Devices & Sound Samplers; Signal Processors; Synthesizers & Keyboards

Galaxy Audio & Entertainment Services, 703 Grant Ave., Altoona, PA, 16602 (814-944-4596) DE, NJ, NY, OH, PA, VA, WV, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones &

Access.; Custom configurations for road & studio systems

Ice* Associates, Inc., Suite LL-40, One Bala Plaza, Bala Cynwyd, PA, 19004-1401 (215-668-0714) USA, Amplifiers; Consoles, Sound Reinforcement, Recording & Production; Editing Systems; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; MIDI Devices & Sound Samplers; Noise Reduction Systems; Recording Tape; Signal Processors; Synthesizers & Keyboards; Tape Duplication; Tape Machines, Analog & Digital; Test & Measurement Equip.; Time Code Synchronizers

Medley Music Corp., 1041 Lancaster Ave., Bryn Mawr, PA, 19010 (215-527-3090) DE, NJ, PA, Amplifiers; Consoles, Recording & Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; MIDI Devices & Samplers; Noise Reduction Systems; Recording Tape; Signal Processors; Synthesizers & Keyboards; Tape Machines, Analog

Midwest Communications Corp., 535 Rochester Road, Pittsburgh, PA, 15237 (412-364-6780) PA, Amplifiers; Consoles, Sound Reinforcement, Recording & Production; Editing Systems; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; MIDI Devices & Sound Samplers; Noise Reduction Systems; Recording Tape; Signal Processors; Tape Duplication; Tape Machines, Analog & Digital; Test & Measurement Equip.; Time Code Synchronizers

Peirce-Phelps, Inc., 2000 North 59th St., Philadelphia, PA, 19131 (215-879-7171) USA, in Canada-Ont. & Que., Amplifiers; Consoles, Sound Reinforcement & Recording & Production; Editing Systems; Equalizers; Loudspeakers, Studio Monitoring & Sound Reinforcement; Microphones & Acces.; Noise Reduction Systems; Recording Tape; Signal Processors; Tape Duplication; Tape Machines, Analog & Digital; Test & Measurement Equip.; Time Code Synchronizers

Radio Systems, Inc., 5113 W. Chester Pike, Edgemont, PA, 19028 (215-356-4700; 800-523-2133; PA-800-423-2133) USA & Canada, Amplifiers; Consoles, Recording & Production; Equalizers; Loudspeakers, Studio Monitoring; Microphones & Acces.; Recording Tape; Signal Processor; Tape Machines, Analog

Sigmat Corp., P.O. Box 995, Valley Forge, PA, 19481 (215-783-6666) DE, DC, MD, NJ, NY, PA, VA, Amplifiers; Consoles, Recording, Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; MIDI Devices; Signal Processors; Tape Machines, Analog; Test & Measurement Equip.; Time Code Synchronizers

Zeus Light & Sound, 2702 Pricetown Road, Temple, PA, 19560-9799 (215-921-0520) USA, Amplifiers; Cable & Connectors; Cases; Compressors; Consoles, Recording, Production & Sound Reinforcement; Delays; Equalizers; Headphones & Headsets; Lighting Equip.; Limiters; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; Noise Reduction Systems; Signal Processors; Transformers

TENNESSEE

Audio Systems Inc., 205 22nd Ave. N., Nashville, TN, 37203 (615-320-1600) AL, GA, KY, TN, Loudspeakers, Studio Monitoring; Recording Tape; Tape Duplication

Evans Sales & Marketing, 509-A Ligon Drive, Nashville, TN, 37204 (615-256-4675) AL, GA, MS, NC, SC, TN, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Loudspeakers, Sound Reinforcement; Studio Monitoring; Microphones & Acces.; Signal Processors

Memphis Communications Corp., 1381 Madison Ave., Memphis, TN, 38174-1735 (901-725-9271) USA, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Editing Systems; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; MIDI Devices & Sound Samplers; Noise Reduction Systems; Recording Tape; Signal Processors; Synthesizers & Keyboards; Tape Duplication; Tape Machines, Analog & Digital; Test & Measurement Equip.; Time Code Synchronizers

Songbird Digital, Inc., 2816 Columbine Place, Nashville, TN, 37204 (615-297-8766) FL, GA, IL, IN, IA, KS, KY, LA, MI, MN, MS, MO, NE, NC, ND, OH, OK, SC, SD, TN, TX, WV, Synclavier & Direct-to-Disk

Studio Supply Co., 1717 Elm Hill Pike, Suite B-9, Nashville, TN, 37210 (615-366-1890) AL, AR, FL, GA, IN, KY, LA, MS, MO, NC, OH, OK, SC, TN, TX, VA, WV, Amplifiers; Consoles, Recording & Production; Equalizers; Loudspeakers, Sound Reinforcement & Studio; Micro-

phones & Acces.; MIDI Devices & Samplers; Noise Reduction Systems; Recording Tape-Digital; Signal Processors; Tape Machines; Analog & Digital; Time Code Synchronizers

Technical Support Systems, Inc., 1415 Madison Ave., Memphis, TN, 38104 (901-725-9122) AL, CO, CT, FL, GA, KY, LA, MS, MO, NC, SC, TN, WY, Amplifiers; Consoles, Recording & Sound Reinforcement; Editing; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; Signal Processors; Broadcast, Entertainment Video Lighting Systems

Wilson Audio Sales, 5972 Asberry Court, Nashville, TN, 37221 (615-646-4477) AL, GA, MS, SC, TN, Amplifiers; Consoles, Production & Sound Reinforcement; Equalizers; Loudspeakers, Monitor & Sound Reinforcement; Microphones; Noise Reduction Systems; Signal Processors; MIDI Devices & Samplers

TEXAS

Audio Specialties Co., 13416 Brookgreen, Dallas, TX, 75240 (214-239-2230) TX, Amplifiers; Consoles, Recording; Equalizers; Loudspeakers; Studio Monitoring; Microphones & Acces.; Noise Reduction Systems; Recording Tape; Signal Processors; Tape Machines, Analog & Digital; Time Code Synchronizers; Editing & Head Cleaning Items for Recording Equip.

Core Systems, Inc., 10440 Westpark, Houston, TX, 77042 (713-977-9500) AR, LA, OK, TX, Mexico, Consoles, Recording & Production; Signal Processors; Tape Machines, Analog & Digital; MIDI Devices & Samplers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Time Code Synchronizers; Microphones

Crossroads Audio, Inc., 2623 Myrtle Springs Ave., Dallas, TX, 75220 (214-358-2623) LA, OK, TX, Amplifiers; Consoles, Sound Reinforcement; Equalizers, Sound Reinforcement & Studio; Microphones & Acces.; Noise Reduction; Signal Processors; Tape Machines, Analog; Wireless Microphones, Intercommunications Equip.

The Digital Center, 2003 N. Henderson, Dallas, TX, 75206 (214-826-8700 TX, Amplifiers; Loudspeakers; Studio Monitoring; Recording Tape; Tape Machines, Analog; Microphones & Acces.

Digital Technology Group, 5635 E. Rosedale, Fort Worth, TX, 76112 (817-429-9761) AR, LA, NM, OK,

TX, Amplifiers; Consoles, Sound Reinforcement, Recording & Production; Editing Systems; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; MIDI Devices & Sound Samplers; Noise Reduction Systems; Recording Tape; Signal Processors; Synthesizers & Keyboards; Tape Duplication; Tape Machines, Analog & Digital; Test & Measurement Equip.; Time Code Synchronizers

Victor Duncan, Inc., 6305 N. O'Connor, Building 4, Irving, TX, 75039-3510 (214-869-0200) USA & Canada, Audio, Film, Video, Lighting Production Equipment; Test Equip.; Tape; Vans & Acces.; Service & Repair; Over 300 Lines of Pro Equip.

HRC Magnetics, 1611 Herring, Waco, TX, 76708 (817-756-5303; 800-443-8457) USA and Canada, Recording Tape; Tape Duplication; Video Tape; Broadcast Video Tape; Video Tape Duplication; Microphones & Acces.

Judon Enterprises, P.O. Box 763041, Dallas, TX, 75376-3041 (214-372-3088) 250 mile radius of Dallas, Amplifiers; Consoles, Sound Reinforcement; Editing Systems; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; MIDI Devices & Sound Samplers; Recording Tape; Signal Processors

LD Systems, Inc., 467 West 38th St., Houston, TX, 77018 (713-695-9400; FAX 713-695-8015) AR, LA, OK, TX, Amplifiers; Consoles; Recording, Production & Sound Reinforcement; Loudspeakers, Studio Monitoring; Microphones & Acces.; MIDI Devices & Sound Samplers; Noise Reduction Systems; Recording Tape; Signal Processors; Tape Duplication; Tape Machines, Analog; Time Code Synchronizers; Equalizers

Lightning Music & Sound, Inc., 7801 N. Lamar, Suite B148, Austin, TX, 78752 (512-451-6535) TX, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Editing Systems; Equalizers; Loudspeakers, Studio Monitoring & Sound Reinforcement; Microphones & Acces.; MIDI Devices & Sound Samplers; Noise Reduction Systems; Recording Tape; Signal Processors; Synthesizers & Keyboards; Tape Machines, Analog & Digital; Time Code Synchronizers

Lightning Music & Sound, Inc., 4801 Spring Valley, Suite 103A, Dallas, TX, 75244 (214-387-1198) TX, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Editing Systems; Equalizers; Loud-

speakers, Studio Monitoring & Sound Reinforcement; Microphones & Acces.; MIDI Devices & Sound Samplers; Noise Reduction Systems; Recording Tape; Signal Processors; Synthesizers & Keyboards; Tape Machines, Analog & Digital; Time Code Synchronizers

Midcom, Inc., 6311 B, O'Connor Road, Suite 108, LB50, Irving, TX, 75039-3510 (214-869-2144) AR, LA, OK, TX, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Editing Systems; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; MIDI Devices & Sound Samplers; Noise Reduction Systems; Recording Tape; Signal Processors; Tape Duplication; Tape Machines, Analog & Digital; Test & Measurement Equip.; Time Code Synchronizers; Intercom Systems; Wireless Systems; Headphones

Parker Music, 9941 N. Freeway, Houston, TX, 77037 (713-820-0031) TX, Amplifiers; Consoles, Sound Reinforcement, Recording & Production; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Tape Machines, Analog; Microphones & Acces.; MIDI & Sound Samplers; Noise Reduction; Recording Tape; Signal Processing; Synthesizers & Keyboards; Time Code Synchronizers

P.A.S. (Professional Audio Supply), 5700 East Loop 820 South, Fort Worth, TX, 76119-7050 (800-443-7668) USA, Amplifiers, Consoles; Equalizers; Loudspeakers; Microphones & Acces.; Noise Reduction Equipment; Recording Tape; Signal Processors; Tape Duplication; Tape Machines, Analog; Test & Measurement Equip.

The Pressing Plant, 111 Oak Lawn, Dallas, TX, 75207 (214-748-6622) USA, Compac Disc; Cassettes; Albums; Jackets & Boxes

Rockin' Robin Guitars & Music, 3619 S. Shepherd, Houston, TX, 77098 (713-529-5442) AK, LA, NM, OK, TX, Amplifiers; Consoles, Sound Reinforcement, Recording & Production; Equalizers; Loudspeakers, Monitoring & Sound Reinforcement; Microphones & Acces.; MIDI; Noise Reduction; Recording Tape; Signal Processors; Synthesizers & Samplers; Keyboards; Tape Machines, Analog; Time Code; Keyboards

Studio Supply Co. Dallas, 9990 Monroe Drive, Suite 108, Dallas, TX, 75220 (214-358-0050) AR, LA, OK, TX, Amplifiers; Consoles, Recording & Production, Equalizers; Loudspeakers, Studio; Microphones, MIDI-Sound Samplers; Noise Reduc-

tion; Tape Machines, Analog & Digital; Time Code Synchronizers

Texsound Audio Visual Services, Inc., 16138 W. Hardy Road, Houston, TX, 77060 (713-876-1063) LA, OK, TX, Amplifiers; Consoles, Sound Reinforcement; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; Tape Duplication; Rental of Projection, Audio, Video & Lighting Equip.

UTAH

Performance Audio, 2358 S. Main, Salt Lake City, UT, 84115 (801-466-3196) CO, ID, MT, NV, UT, WY, Amplifiers; Consoles, Recording & Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones; Tape; Signal Processors; Tape Duplication; Tape Machines, Analog & Digital; Time Code Synchronizers; Installations

Trax Audio, 545 West 500 South, Suite 150, Bountiful, UT, 84010 (801-298-3280) AZ, CO, ID, NV, NM, UT, WY, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Editing Systems; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Acces.; MIDI Devices & Sound Samplers; Noise Reduction Systems; Recording Tape; Signal Processors; Synthesizers & Keyboards; Tape Duplication; Tape Machines; Analog & Digital; Test & Measurement Equip.; Time Code Synchronizers

VERMONT

Advance Music Center, Inc., 61 Main St., Burlington, VT, 05401 (802-863-8652) USA, Amplifiers; Consoles, Recording & Sound Reinforcement; Equalizers; Editing Systems; Loudspeakers, Studio & Reinforcement, Microphones; MIDI; Noise Reduction; Recording Tape; Signal Processing; Synthesizers; Tape Duplication; Tape Machines; Time Code Synchronizers

VIRGINIA

Linden Inc., 229 N. Henry St., Alexandria, VA, 22314-2436 (703-549-4424) DC, MD, VA, Amplifiers; Consoles, Sound Reinforcement; Loudspeakers, Sound Reinforcement; Microphones & Acces.; Tape Duplication

WASHINGTON

American Music, 14340 N.E. 20th, Bellevue, WA, 98007 (206-641-5005) AK, WA, Amplifiers; Consoles, Recording & Sound Reinforcement; Equalizers; Loudspeakers, Reinforcement & Monitoring; Microphones; MIDI Devices & Samplers; Noise Reduction; Recording Tape; Signal Processors; Synthesizers; Tape Duplication; Tape Machines, Analog; Time Code Synchronizers

Broadcast Supply West, 7012 27th St. W., Tacoma, WA, 98466 (206-565-2301; 800-426-8434) USA & Canada, Amplifiers, Consoles, Sound Reinforcement & Recording & Production; Equalizers; Loudspeakers; Microphones & Access.; Noise Reduction; Recording Tape; Signal Processors; Synthesizers & Keyboards; Tape Duplication; Tape Machines, Digital

Future Sales, P.O. Box 2077, Remond, WA, 98073 (206-868-5577) AK, HI, ID, MT, OR, WA, Amplifiers; Consoles, Recording & Production; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Access.; MIDI Devices & Sound Samplers; Signal Processors; Synthesizers & Keyboards; Securing Straps for Wire & Cables

Northmar, Inc., 1011 N.E. 69th, Seattle, WA, 98115 (206-524-5170) AK, ID, MT, OR, WA, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Access.; Noise Reduction Systems; Signal Processors

Pacnor Marketing, Inc., 21026 67th Ave. W., Suite E, Lynnwood, WA, 98036 (206-771-6016) AK, ID, MT, OR, WA, Amplifiers; Consoles, Sound Reinforcement; Loudspeakers, Sound Reinforcement & Studio Monitoring; Signal Processors; Wire & Cable

PNTA (Pacific Northwest Theatre Associates, Inc.), 333 Westlake Ave. N., Seattle, WA, 98109-5282 (206-622-7850) AK, ID, MT, OR, WA, Amplifiers; Consoles; Sound Reinforcement; Equalizers; Loudspeakers, Sound Reinforcement; Microphones & Access.; Specialize in sound reinforcement systems for stage & theatre use

Repronics Northwest, 911 Western Ave., Suite 334, Seattle, WA, 98104 (206-624-2790) AK, No.-ID, West-MT, OR, WA, Consoles, Recording, Production & Sound Reinforcement; Equalizers; Microphones & Access.; Noise Reduction

Systems; Tape Duplication; Tape Machines, Analog; Time Code Synchronizers

RMS Sound, 17517 15th Ave. N.E., Seattle, WA, 98155 (206-362-0491) AK, ID, OR, WA, Professional Audio Recording Equipment

WISCONSIN

American Audio Systems, 2202 W. Beltline Highway, Madison, WI, 53713 (608-271-0090) Nationwide, Amplifiers, Consoles, Recording, Production & Sound Reinforcement; Editing Systems; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Access.; MIDI Devices & Sound Samplers; Noise Reduction Systems; Recording Tape; Signal Processors; Tape Duplication; Tape Machines, Analog & Digital; Test & Measurement Equip.; Time Code Synchronizers

AudiLine, Inc., 2323-J Bluemound Road, Waukesha, WI, 53186 (414-785-9166) IL, IN, IA, KS, KY, MI, MN, MO, MT, NE, ND, OH, OK, OR, TN, WI, WY, Amplifiers; Consoles, Sound Reinforcement, Recording & Production; Equalizers; Loudspeakers, Studio Monitoring; Microphones & Access.; MIDI Devices & Sound Samplers; Noise Reduction Systems; Recording Tape; Signal Processors; Tape Machines, Analog; Time Code Synchronizers; Editing Systems; Tape Duplication

Callan's Skogmo Store, dba Bear Creek Sound, 113-115 W. Main St., Durand, WI, 54736 (715-672-8750) MN, WI, Amplifiers; Loudspeakers, Sound Reinforcement

Full Compass Systems, Ltd., 6729 Seybold Road, Madison, WI, 53719-1393 (608-271-1100) USA, Amplifiers; Consoles, Recording, Production & Sound Reinforcement; Editing Systems; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitoring; Microphones & Access.; Noise Reduction Systems; Recording Tape; Signal Processors; Tape Duplication; Tape Machines, Analog & Digital; Test & Measurement Equip.; Time Code Synchronizers; Video Equip.; Lighting Equip.

Lewis Sound, Inc., 210 S. Second St., Milwaukee, WI, 53204 (414-273-6969) USA, Amplifiers; Consoles; Equalizers; Loudspeakers; Microphones; Signal Processors

Regenberg Music/Pro-Audio, 6615 University Ave., Middleton, WI, 53562 (608-836-1501) IL, IA, MN, WI, Amplifiers; Consoles, Sound Reinforcement, Recording & Pro-

duction; Equalizers; Loudspeakers, Sound Reinforcement & Studio Monitors; Microphones & Access.; MIDI Devices & Samples; Signal Processors; Synthesizers & Keyboards; Tape Machines, Analog; Time Code Synchronizers; Cases & Racks; Cable-Custom Fabrication; Music Software

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The Imaginative Marketing Group (A Soundcraft Canada Subsidiary), 1444 Hymus Blvd., Dorval, Que., Canada, H9P 1J6 (514-685-2046) Canada, Consoles, Recording, Production & Sound Reinforcement; Amplifiers; Equalizers; MIDI Devices & Sound Samplers; Signal Processors

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Tape Machines, Analog

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Soundcraft Electronics Canada Inc., 1444 Hymus Blvd., Dorval, Que., Canada, H9P 1J6 (514-685-1610) Canada, Consoles, Record-

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Los Angeles, CA 90056
213-649-MIDI

MIDI Manufacturers Association (MMA)

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Los Angeles, CA 90064
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Nashville Entertainment Association (NEA)

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Winter NAMM, Anaheim, CA.

March 7-10

86th AES Convention, Hamburg, West
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April 29-May 2

NAB, Las Vegas, NV.

May 14-17

AES International Conference on Digital
Audio, Toronto.

May 25-27

NSCA, Nashville.

June 17-20

Summer NAMM, Chicago.

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TRUTH...

OR
CONSEQUENCES.

If you haven't heard JBL's new generation of Studio Monitors, you haven't heard the "truth" about your sound.

TRUTH: A lot of monitors "color" their sound. They don't deliver truly flat response. Their technology is full of compromises. Their components are from a variety of sources, and not designed to precisely integrate with each other.

CONSEQUENCES: Bad mixes. Re-mixes. Having to "trash" an entire session. Or worst of all, no mixes because clients simply don't come back.

TRUTH: JBL eliminates these consequences by achieving a new "truth" in sound: JBL's remarkable new 4400 Series. The design, size, and materials have been specifically tailored to each monitor's function. For example, the 2-way 4406 6" Monitor is ideally designed for console or close-in listening. While the 2-way 8" 4408 is ideal for broadcast applications. The 3-way 10" 4410 Monitor captures maximum spatial detail at greater listening distances. And the 3-way 12" 4412 Monitor is mounted with a tight-cluster arrangement for close-in monitoring.

CONSEQUENCES: "Universal" monitors, those not specifically designed for a precise application or environment, invariably compromise technology, with inferior sound the result.

TRUTH: JBL's 4400 Series Studio Monitors achieve a new "truth" in sound with

an extended high frequency response that remains effortlessly smooth through the critical 3,000 to 20,000 Hz range. And even extends beyond audibility to 27 kHz, reducing phase shift within the audible band for a more open and natural sound. The 4400 Series' incomparable high end clarity is the result of JBL's use of pure titanium for its unique ribbed-dome tweeter and diamond surround, capable of withstanding forces surpassing a phenomenal 1000 G's.

CONSEQUENCES: When pushed hard, most tweeters simply fail. Transient detail blurs, and the material itself deforms and breaks down. Other materials can't take the stress, and crack under pressure.

TRUTH: The Frequency Dividing Network in each 4400 Series monitor allows optimum transitions between drivers in both amplitude and phase. The precisely calibrated reference controls let you adjust for personal preferences, room variations, and specific equalization.

CONSEQUENCES: When the interaction between drivers is not carefully orchestrated, the results can be edgy, indistinctive, or simply "false" sound.

TRUTH: All 4400 Studio Monitors feature JBL's exclusive Symmetrical Field Geometry magnetic structure, which dramatically reduces second harmonic

distortion, and is key in producing the 4400's deep, powerful, clean bass.

CONSEQUENCES: Conventional magnetic structures utilize non-symmetrical magnetic fields, which add significantly to distortion due to a nonlinear pull on the voice coil.

TRUTH: 4400 Series monitors also feature special low diffraction grill frame designs, which reduce time delay distortion. Extra-large voice coils and ultra-rigid cast frames result in both mechanical and thermal stability under heavy professional use.

CONSEQUENCES: For reasons of economics, monitors will often use stamped rather than cast frames, resulting in both mechanical distortion and power compression.

TRUTH: The JBL 4400 Studio Monitor Series captures the full dynamic range, extended high frequency, and precise character of your sound as no other monitors in the business. Experience the 4400 Series Studio Monitors at your JBL dealer's today.

CONSEQUENCES: You'll never know the "truth" until you do.



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