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Applications in Sound Reinforcement



Dear Readers.

We recently surveyed *Mix* subscribers to discover what you find most valuable in our monthly live sound section. In short, you told us to continue our coverage of applications and business issues. We've incorporated your suggestions into *Mix*, but we also wanted a way to tackle some of these areas in more depth than the monthly magazine allows. So welcome to *Live Mix*—our supplement devoted exclusively to sound reinforcement topics.

On the technical front, we have some portable solutions to the vexing problem of poor room acoustics. You'll find crucial information on rigging safety and hands-on tips on drum miking. We've also included a discussion by veteran monitor engineers on the psychology of monitor mixing.

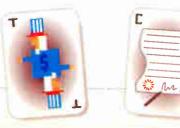
Although none of us enjoy wrestling with insurance or taxes, having a successful sound company means taking care of business. To that end, we offer two articles that address these concerns from a regional sound company's perspective.

We hope you enjoy this view of live sound through the *Mix* looking glass. And don't hesitate to let us know what you'd like to see more of in future issues.



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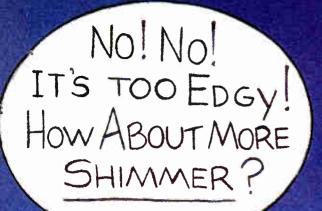
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Cover design and photography by Rob Cardln. Additional cover photography by Steve Jennings and Jay Blakesberg. Schematic courtesy of Craig Janssen & Acoustic Dimensions. Special thanks to Raul Suarez of Third Bar Sound for providing the Soundcraft Europa console.





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Psychology Monitor Mixing

by David (Rudy) Trubitt

Illustration by Jim Pearson

As any live sound engineer will tell you, there's a lot more to monitor mixing than simply knowing which knob to turn. Much has been written about the finer points of mixing for the audience, but less has been said about the complex task of mixing for performers. Several engineers volunteered their views on what makes a successful monitor mixer.

eep Parker started like many who entered the live sound field in the late '60s: He hooked up with a local band during his college days. The band was signed, their label was bought, and Parker followed them from the Midwest to California in 1970. When the band split, Parker wound up at an early management company of Jackson Browne's, doing sound for Browne and Bonnie Raitt. In '74 Parker moved to Nashville to work with Carlo Sound, Browne's contracted sound company. "I was involved with the early Eagles, the late Allman Brothers, the Bay City Rollers and a lot of Southern rock bands like Wet Willie," Parker says.

Parker describes the trend towards specialization during that period. "It became more difficult to do several different jobs. What used to be an 18foot truck filled with lights, sound and band equipment became a 48-foot truck filled with nothing but sound. At Carlo, the monitor mixer progressed to front-of-house—that's the way it was with a lot of early sound companies. But more people were specializing, because if you were actually doing your job to take care of the monitors and plug in the stage, you didn't have time to get out and survey the house and figure out what was going on there." In 1978 Parker joined Maryland Sound Industries (MSI) and has been there ever since. His most recent tour was with Manhattan Transfer.

Paul Sontheimer began his travels as a musician and woodworker. After a move to Dallas in the late '70s, he landed a job in Showco's wood shop building cabinets. He began mixing monitors for Showco in 1981. "My first monitor gig was a trial by fire, with people yelling at me and this and that," says Sontheimer. "I just tried to maintain my composure

W&IVER acid Itstory

through it all. Right after that I mixed the opening acts for a Chaka Khan tour. I learned how to run the monitor board, learned some of the tricks of EQ'ing vocal mics. I spent three years with Rick James. It was a lot of work, but I learned how to mix big 12-piece bands. In the early '80s, Showco did a lot of R&B bands, so I did The Barclays, Cameo and people like that." Following that, Sontheimer worked with James Taylor in the mid-'80s. "That was good," he says, "because it gave me a different perspective on sound. Before that it didn't matter how it sounded, as long as you could get it loud enough."

TRUST

"Doctor" Dave Staub was with MSI from '79 to '88. During that stint, he worked with acts such as Harry Chapin, Juice Newton, Frankie Valli and Whitney Houston. Next came Paul Simon's Graceland tour in 1987. After a break from the road. Staub was called back for Simon's '91 world tour with Clair. "Doing monitors for a band is more of a sociological or psychological thing," Staub says. "Anybody can come out here and be a good technician and get the monitors loud, but the bottom line is to get the band to trust you. If they're comfortable working with you, and you with them, you get trust. I find, especially at this point [during the Simon tour], that I have very few conversations with the band during the show. There are some incidental things, but I

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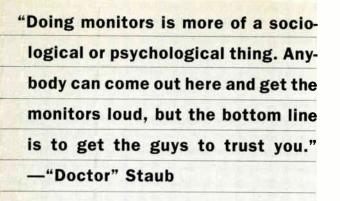
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don't change anything much during the show. I try to get the band thinking that if it doesn't sound right, maybe it's something that someone on stage is doing. Otherwise, I have 18 people looking at me constantly through the whole show."

But how is trust built? "It was hard to get it with Paul," Staub admits. "It took me all of '87, which is why I'm back out with him now. It took a little while to get [drummer] Steve Gadd around, too. I don't think he'd ever done a tour like this before, and he was uncomfortable at first. I had to say, 'Here's what's going on, here's what I can and can't do about it, and together we can try things and make it work.' Honesty is always the best policy. You go out and tell people what you can and can't do and you hope that they'll respond to that. Also, everybody [on the Simon tour] understands how complicated this is-it's definitely one of the most complex systems on the road."

Parker describes another reason why trust is essential. "The great catch-22 of any musician's career is that they can't hear themselves play [from the audience's perspective]. No matter how many videotapes you make, the musicians can't sit in the audience and hear it exactly as they do," continues Parker, "so the band has to build a trust with the people they're working with. The artist has to be confident that you know what you're talking about, and they have to inspire trust in you that what they're saying has some validity. But, of course, this is a service industry and the customer is always right."

THE RELATIONSHIP

The most delicate part of a monitor engineer's job may be building a working relationship with the artist. Paul Sontheimer comments on his longest gig to date—Showco client Eric Clapton. "He's a great guy. I worked with him for six years, up until last year. I learned a lot about the psychology of monitors—when to say things and when not to say things. You know by the end of three songs what it's going to be like and how you're going to act for the rest of the show. Either you'll keep a low profile or laugh and joke with people—it's

just one of those things you pick up on. There were a few times working for Eric when I might have pressed a point too much by asking him too many questions. That's how I learned when to back off and leave a musician, who has a lot more on his mind than technical things, alone."

"In a long-term relationship," Parker says, "you learn their interests. They don't want to know which amps produce what, they want to know the result and if you can get it. In a short-term situation, you have to suss it out, and that's where experience comes in. You have to trust your instincts." Another useful skill is the ability to keep a cool head in tense situations. "There are horror stories about the artist who is unable to be pleased, no matter what," Parker continues. "You hear about artists who will throw things at the monitor mixer, or stalk off the stage and blame it on the technician. Well, it happens. We've all been fired from a gig, whether in the middle of a tour or after it's over. It's unavoidable, because sometimes the personality mix just isn't there."

"An interesting experience came up when Phil Collins joined the Clapton tour," Sontheimer volunteers. "I had a few technical problems one night, and Phil gave me a look like, 'Hey, what's going on here?' You could see that the man was upset. I was called into the dressing room after the show and he tells me, 'No matter what happens out there, when the show's over, that was out there. In the heat of the moment I'm going to get mad, but don't take it literally.'"

One point was mentioned more than once: "If the artist doesn't say anything, you assume there isn't a problem," Parker says. Sontheimer concurs: "If nobody said anything bad, then you



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assume it's good. Don't go looking for trouble or fishing for answers or trying to find out what the vibe was. If you don't hear anything, you're doing fine."

DEALING WITH REQUESTS

"When working with musicians," Parker says, "you need to interpret their language. There are musicians who are also studio technicians who can know as much about audio as you do. The others are people who have a vision, but they don't tell you in terms like '3 dB at 400 cycles.' They tell you in colors, terms like 'boxey,' all different types of sound idioms that you have to interpret. If you're only working with an

artist once, you have to guess. But if you are fortunate enough to discover an artist who is having a successful career, who likes and trusts you and carries you along, over time you learn to interpret what it means when they say 'it sounds a little woolly.'

Sontheimer elaborates: "There are two categories of requests: reasonable and unreasonable. Let's talk about reasonable. Obviously, level changes are fine. I'd say 50% of level changes are up and 50% are down. One thing I learned a long time ago was that people always ask for more, and you get to a point when something's going to blow up. Psychology starts here! Let's turn all that



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down to give the impression of turning this up. It always seemed to work, and does to this day."

And an unreasonable request? "Let's say you have a kick drum with one channel of equalization, but you send it to 16 different places," Sontheimer says. "It's going to go all over the stage, but you start to work on the sound at the drum kit. Now, you get it to sound good there, but what's it going to sound like when you put it through another type of speaker cabinet? People standing in front of wedges without sub-bass say, 'This doesn't sound like it does back there!' All of a sudden, everyone wants the kick to have separate EQ for every send on the board." Fortunately, there is another alternative. "If you know people are going to be complaining, EQ the drum around the wedges. Then boost 80 or 90Hz narrow band and cut 200-400 Hz on the channel, and fix the drummer's monitor with the graphic or the crossover."

A little diplomacy goes a long way when dealing with difficult requests. Parker explains: "You don't say, 'No, you can't do that.' You say, 'Well, there are obstacles.' Your attitude has to inspire communication, because if there's an adversarial relationship, there's no way two people are going to be able to work together optimally on the stage. Of course, we're talking specifics, like if there's one leader. But there are also individuals in that band, and each one wants something different. It's a juggle, because someone will say, 'He's playing too loud, so I need more of this.' If you give the first person more, it becomes too loud on stage, and then the house mixer is coming to you saying, 'There's an *awful* lot of bass coming off the stage,' and the bass player says, 'I'm way down, it's not me.' It's a constant juggle. You try not to volunteer your own opinions-you just try to give people what they ask for."

While creating a consistent sound field regardless of venue is the ideal, the reality is another matter. "If it's a difficult room, you can only do so much," Staub says. "In arenas, the room is going to swamp you. What happens [at sound check] is that some people will play four measures and freak out. I'll get them to play a little bit more, and tell them, 'This is going to be a weird room. I'll do what I can to help you, and you do what you can to help me.' It all goes back to having that trust."

Finally, requests born from inexperience create a whole new set of problems. A typical question might be, "Why

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"Obviously, they're both ripoffs of the Yamaha PM3000."

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CIRCLE #606 ON READER SERVICE CARD World Radio History doesn't it sound like the album?" Describing his tour experience with a new artist fresh from the studio, Sontheimer says, "I was always changing monitor configurations to make it better. The entire tour ended up being an experiment, which taught the artist a lot about sound, but it was also bad because there was no consistent reference point to go by."

LISTENING TO THE MUSIC

Although it's certainly not a prerequisite, many live sound engineers are musicians themselves. It's a fair bet that every mixer who succeeds has a keen ear for music and for the interaction that takes place between players. How, then, do monitor mixers respond to the intangibles of musical interplay?

Dave Bryson has mixed monitors for Tom Petty & the Heartbreakers since 1978. "Because I've been with them that long," says Bryson, "I hear little things and see when someone's playing off of someone else, and I mix them up for each other. They don't even notice it, because that's what they're into. I know them well enough that they'll give me a free hand; I don't stand there waiting for instructions. I'll get instructions if something's not right, but if it's a good night I'm the invisible man. I have fun mixing—just enjoy yourself and get into it."

Jim Yakabuski was last out with Van Halen's '91 tour. He offers some general comments. "If singers have a difficult night," says Yakabuski, "you try and give them everything you can psychologically. A lot of times it's almost opposite to what they want. They'll want to be tucked down in the mix a little more so they don't hear themselves as well and don't hear if they're straining or whatever. That's one of the psych lessons you learn."

"In essence," Parker says, "a monitor mixer creates an on-stage atmosphere that the artist can be comfortable in. If you do 120 shows with an artist over a year, you can tell within the first songand-a-half whether it's going to be a good night or not. Now, you can't account for the fact that it sounds great but the audience just sits there—you can see it drain away. There's nothing you can do about that. But if the artist starts feeling pressured and looks over to you to do things, you don't cop an attitude. You do everything you can to help them feel comfortable. And it's a fragile balance. The most inane thing can throw it off—it'll still be a great show, but it won't be *the* great show."

"I think this job is at least 50 percent psychology," says Sontheimer. "You have to know what you're doing technically, but at the same time you have to have a feel for it. Being a musician myself helps me." Sontheimer has trained a number of people during his time with Showco and offers some advice. "I tell them to be low key and not get too involved with the musicians until the band becomes comfortable with you. The main thing is to make everything as consistent as possible. That's why people have rehearsals. After a week or two on the road, you should be able to make the mix as consistent as possible."

"Psychology is more important than technology," concludes Staub. "You have to get along with people. Successful monitor engineers can go out with any band and fit in and build trust. Great gear certainly helps, but without it you still have to do the show. That's where the people who know all the little head secrets make it happen."

David (Rudy) Trubitt is Mix magazine's sound reinforcement editor.



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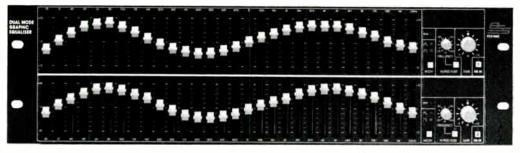
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take place in venues that were designed without much attention to acoustics. Each auditorium, gymnasium, convention center, church or club will have differing acoustical characteristics that affect how well the audience hears the performance. It is difficult to provide portable, quick acoustical solutions for problematic venues when constrained by a small budget. Usually, only low-cost materials or materials that can be rented can be considered for temporary use. Though no two rooms are the same, we can consider some common acoustical problems, look at remedies that have been applied in the field and suggest a few possible solutions.

show that takes place in a gymnasium, convention center or other large multipurpose venue presents the most common problems. These rooms, especially the older ones, were typically designed with minimal acoustical treatment and are often highly reverberant. To make them acceptable for musical performances on a permanent basis would require adding absorptive material to the room surfaces. This can often be costly, and most facilities will not spend the money to correct such problems.

How can you deal with these issues on a temporary basis? The first thing you should do is decide whether the overall reverberance is the problem or if specific reflections are responsible. If faced with the latter, determine which reflections are the most offensive. Look the room over and listen to it. From where do you hear large echoes returning? In most large rectangular spaces that are constructed of block, the rear wall of the room is the worst offender. Usually, a large, distinct reflection can be heard off of this wall. Since sound travels at approximately 1,180 feet per second, if the wall is 100 feet away from the stage, a clearly audible discrete echo will return to the stage in about 236 milliseconds. Of course, music is not a single discrete sound but a constant source of varying sounds. As all of these echoes blur with the sound emanating from the stage, it becomes more difficult to hear clearly. The sound quality can be inferior, compromising the audience's enjoyment of the show.

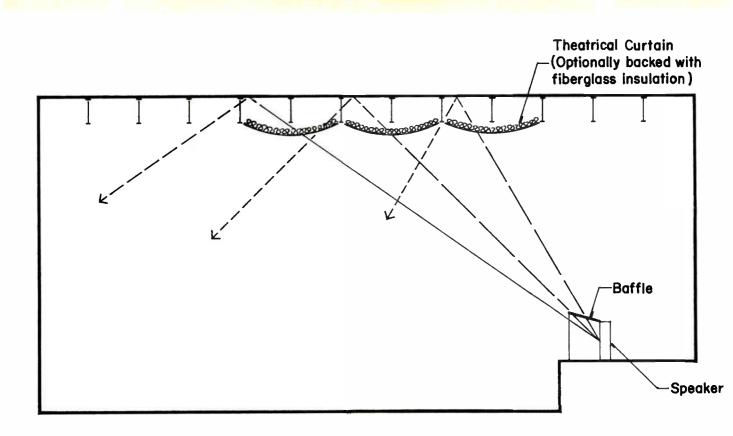
Tom Rose, an acoustical consultant with The Joiner Consulting Group in Arlington, Texas, says that for popular amplified music in multipurpose concert venues, "deader is better." He points out that filling as many seats as possible is not only beneficial in terms of income and crowd excitement, it also adds acoustical absorption to the room in the form of human bodies. In spaces where a finished ceiling exists and trusses are not exposed, he suggests renting pipeframe (typically used for display booths at conventions) from display products suppliers and hanging standard velour theatrical curtains (available from theatrical supply houses). These can be placed across the back of the room. The standard curtain base will usually place the curtains about two feet from the wall. This air space behind the curtain is desirable, as it will improve low-frequency absorption. Adding additional absorptive material behind the curtain can further improve the sound of the room. Rick Talaske, of the Talaske Group in Oak Park, Ill., agrees that using floor stands and acoustical drapery across the back of the room yields a significant improvement with a reasonable amount of effort.

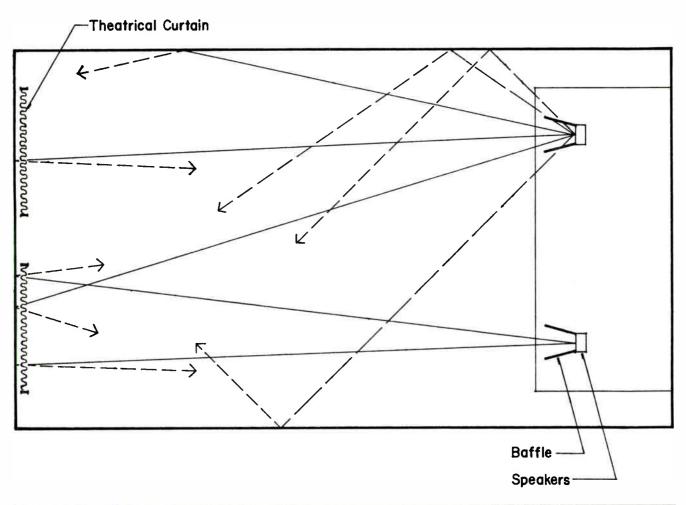
Rose adds that in a gymnasium or convention center where the roof trusses are exposed, the ceiling reflection can contribute significantly to the reverberant field. This can also be treated. Start by laying an absorptive fabric such as theatrical curtains on the floor. Heavier curtains are preferred, though he cautions against the use of a heavy industrial tarpaulin canvas, plastic-coated or tent-type fabric.

Next, attach ropes to the trusses every 20 to 30 feet, and then hoist the fabric up so that the sound emanating from the stage will have a reduced reflection off of the ceiling. The sound can be further improved by attaching standard R-13 unfaced fiberglass thermal building insulation to the top of the cloth before it is hoisted up. The insulation should be attached to prevent it from bunching up once it is suspended

BY RICHARD ZWEIBEL

World kadio Ustory





Theatrical curtains can significantly reduce reflections when deployed over fairly large areas, while smaller baffles around loudspeakers suppress unwanted reflections at the source.



from the ceiling. Covering 50% of the ceiling in this manner can make a significant improvement. Choose areas that would block a reflection from the stage and prevent its arrival in the audience. You can distinguish these areas by imagining a mirrored ceiling. If you were in the audience and you looked into an area of the mirrored ceiling. would you see either the stage or speaker systems? If so, then this area of the ceiling could be a desirable location to add absorption. If you would not see the stage or speakers, then the absorption could be put to better use elsewhere.

ther materials can be used to provide ceiling absorption, too. To deaden a room that was used as both a rehearsal space and an echo chamber at Bearsville Studios, Michael Guthrie (of Telex Communications in Wykoff, N.J.) used hair and jute carpet padding. He reinforced it with gaffer's tape and metal grommets, then suspended it from the ceiling. By adjusting the height, he was able to adjust the bandwidth of absorption. Guthrie points out that though this material was quite inexpensive, it also was very fragile.

Dave Andrews of Andrews Audio Consultants in New York City used theatrical curtains (Duvetyne) to improve the sound quality of shows in theaters such as the Showboat in Atlantic City and The Winter Garden Atrium, a large, highly reverberant room in Battery Park City, N.Y. He hung a series of battens off of eye hooks attached to the roof trusses or pipes with draperies hung off of these, which broke up the paths of reflection associated with the ceiling.

When using theatrical curtains for amplified music, the simple rule of thumb is "the more the better." Side walls and ceilings may also produce unwanted echoes and can add to the reverberance of the room. Obviously, you cannot cover all of the walls and ceiling with acoustical drapery. In fact, these lateral reflections may sometimes be desirable. But when they aren't, there are more feasible strategies you can employ to control them.

By hanging the drapery close to the speakers, you can reduce the level of sound hitting the walls and ceiling. To do this, stand at the speaker and move the frames with the curtains so that you cannot see the surface that you believe to be an "offender." Since the curtain is hile theatrical curtains are far from an ideal product for the problem, they do offer the most "bang for the buck," while remaining easy to set up and transport.

located adjacent to the speaker, a much smaller quantity of curtain is required than when trying to cover the entire wall. While theatrical curtains are far from an ideal product for the problem, they do offer the most "bang for the buck," while remaining easy to set up and transport. Adding a second layer of curtain on a separate frame behind the first can improve the performance. As you add curtains, listen to what effect they have, realizing that one single curtain will not make a lot of difference, but the sum total of all of the curtains may result in the desired improvement. Use your ears to determine what works best for the room. If available, an instrument such as the Techron TEF 20 analyzer allows you to accurately see and measure the existing acoustical problems and evaluate each change you make. Materials other than curtains may be used. For example, sheets of plywood may be covered with fiberglass batting, although they are much more difficult to handle.

Rather than using curtains to absorb sound, Peter D'Antonio, president of RPG Diffusor Systems in Upper Marlboro, Md., fabricates panels out of laminated paper honeycomb, which are stiff yet lightweight. The surface of these baffles is treated with one to four inches of semi-rigid fiberglass and fabric upholstery. These baffles form "barn doors" around the cluster and are angled toward the ceiling, floor and side walls. While these panels are not as readily available or as easy to install as curtains, they offer significantly better performance by essentially flush-mounting the cluster, as is typically seen in recording studio control rooms.

The baffles offer three advantages. They render portions of the side walls, ceiling and stage in the acoustic shadow of the cluster, thereby minimizing reflections from these surfaces; they improve the low-frequency directivity of the cluster; and they offer appreciable lowfrequency gain to the sound system. These baffles should be as large as possible.

D'Antonio also feels that it's important to improve the acoustics onstage. He uses BiffusorsTM, a product that provides absorption on one side and diffusion on the other, as onstage gobos. First, a "curtain" is placed around the drummer, with the absorptive side facing in and the diffusive side facing the

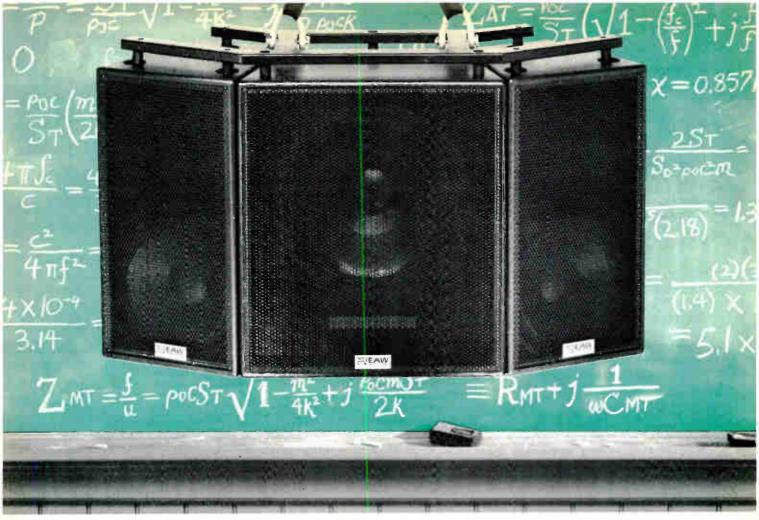
rest of the band. Then other Biffusors are placed around the stage, typically with the absorption facing amplifiers and the diffusion facing acoustic performers, such as vocalists and horns. By properly locating the gobos, a performer using an acoustical instrument can hear the natural sound of his or her instrument more clearly because the energy is returned rather than lost in an absorber. The sound level of other instruments at his or her location is not reduced.

This setup has been used successfully on many of the DMP and Telarc live-to-2-track recordings and by Greg Hockman at the Stardust. In a room where excess reverberance is not a problem, diffusors placed at the rear of the room can improve the sound quality by returning energy to the room without the undesirable slap typical of an untreated wall. Because the sound is not absorbed as it is with curtains, the audience at the rear of the room, where the sound level is the lowest, benefits from the added level of the sound returning from the diffusors. Diffusion essentially improves the coverage of the sound system. Although church sanctuaries are often designed with acoustical considerations in mind, the particular requirements of musical performances are rarely the sorts of considerations the designer anticipated. Many churches are too reverberant for amplified music and can be treated in a similar manner.



ary Harris, of Gary and Timmy Harris in New York City, provides sound rein-

forcement services for operatic performances. He tells of a situation at Wolf Trap Amphitheatre (before it was rebuilt following the 1982 fire) in the Washington, D.C., area where he added



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natural reverberance. Wolf Trap is an amphitheater with a covered seating area open to the outdoors at the entire rear and sides. Since opera requires a reverberant space, Harris chose to place microphones in the pit and hang speakers in a walkway about 30 feet in front of the proscenium (over the audience), aimed at the proscenium arch. Because the arch was of a diffusive nature and the speakers were 30 feet away, he was able to combine an electronic system with natural characteristics to create an initial delay (caused by the distance from the speakers to the proscenium to the audience) and a diffuse field for the orchestra in combination with Farrel Becker's superb direct sound system for vocals. This system was used quite successfully in the '70s for performances including Aida, The Flying Dutchman, War and Peace and Madame Butterfly. Harris has also used a temporary installation of RPG Diffusors on the pit rail at the Opera House in Boston to improve the pit acoustics during performances conducted by Sarah Caldwell.

Andrews also uses electronic solutions for acoustical problems. Sometimes the facility's or promoter's concern for appearance precludes the use of physical treatments. By using a distributed approach to the sound system, it is possible to place many speakers in the hall at a much closer proximity to the audience. Because the speakers are closer, they can be turned down in level, thereby exciting the room to a lesser degree and improving the ratio of direct sound to reverberant sound.

At the Winter Garden show mentioned earlier, Andrews combined acoustical and electronic solutions to provide high-quality sound in a large reverberant space filled with glass and marble, which most people would consider unacceptable for live musical performances. To make matters worse, performances took place from both ends of the room. He was unable to use acoustical draperies due to aesthetic concerns by venue management, so he used two separate sound systems, one for each direction, fed from the left and right channel of the mixing console. This system had 30 distributed speakers in and around the audience, located in palm trees, stage left and right, all delayed and equalized with the SIM® equalization process. The furthest listener was within 20 feet of a speaker.

Noisy mechanical systems can also affect a room's sound quality. These sorts of problems cannot be easily corrected except by the facility. In some cases, acts or sound companies have requested that the systems be run right up until the performance and then shut off. Obviously, the facility management must consider health and comfort issues in making this type of decision, but it may be worth the request. If enough people bring the problem to the facility's attention, it may be fixed in time for your next performance there.

The best solution to acoustical problems is for a qualified acoustical consultant to properly design the facility or to correct existing problems. Unfortunately, budgetary constraints often prevent this. In these rooms, it is necessary to use your eyes, ears and some common sense to improve the acoustics on a temporary basis. The cumulative effect of many "little things" can make the difference between a mediocre show and a successful one.●

Richard Zweibel is a principal consultant at the acoustical design firm The Joiner Consulting Group in Arlington, Texas.

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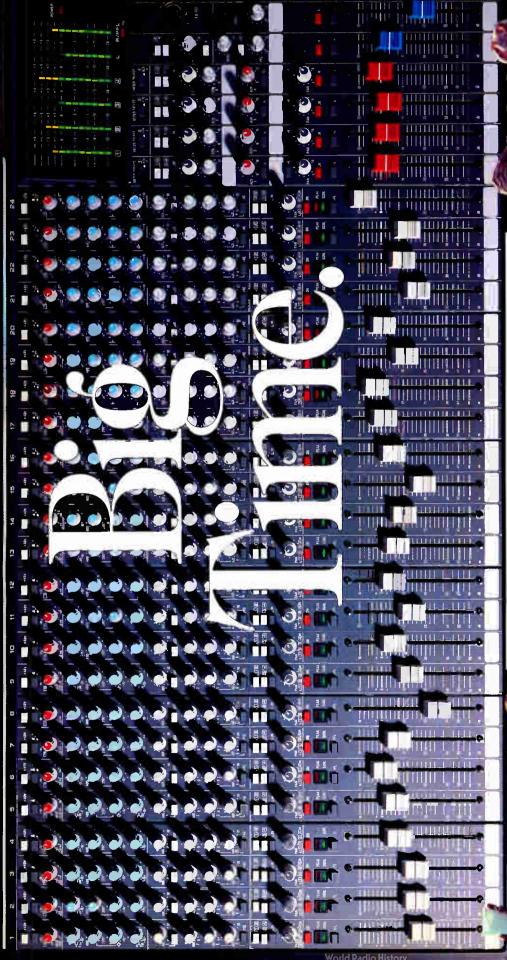


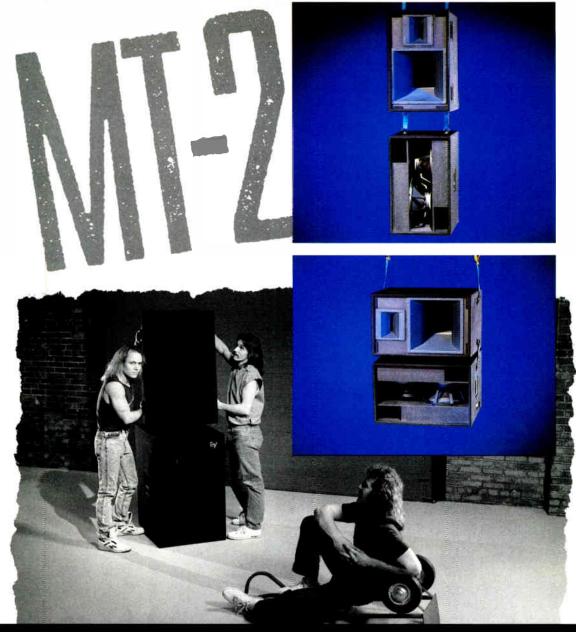
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Safe Rigging Practices

the country. Users and manufacturers alike share a concern for the safety of these systems, but, surprisingly, there are no standards for rigging design, nor accreditation of riggers themselves. Fortunately, those familiar with the do's and don'ts are eager to share their knowledge in the interest of safety for all involved. The information provided here is intended as food for thought and not explicit design information. When rigging, always seek the advice of qualified experts.

or years a staple of the touring scene, flown loudspeakers are now commonplace in smaller venues and installations all over

The most basic rule of safe rigging is designing your rig to support five times the weight of your maximum intended load. While most sound reinforcement people have heard of this 5:1 design factor, not everyone understands why it is so important. If a rigging system is designed with a reduced safety factor, say 2:1 or 3:1, it's still two to three times stronger than it needs to be, isn't it? Harry Donovan, a 22-year veteran of the tour scene, warns, "The speakers won't stay up in the air as long-the rigging will eventually break." Andrew Martin, president of the ATM Group, a manufacturer of loudspeaker flying hardware, agrees. "Everybody's always very interested in the right way to do it," he says. "At the same time, not everyone is ready to build it that way, due to the cost involved. They may not have had accidents using a safety factor of 2:1 or 3:1, but it doesn't mean they won't down the road."

by David (Rudy) Trubitt

A 5:1 design factor is necessary for a number of reasons. Although only loadrated hardware should be used, it is possible that such a fitting does not meet its published specification. This could be due to wear, a manufacturing defect or other causes. In any case, if the part is being loaded to one-fifth of its rated capacity, a reduction in its strength is less likely to cause a catastrophic failure.

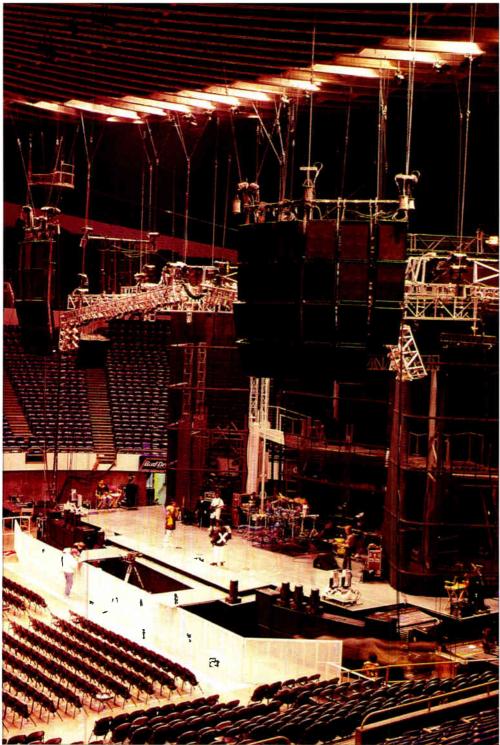
Another reason for over-design is the dynamic loading put on a rigging system when starting and stopping chain motors. Andrew Martin recently analyzed the problem with a structural engineer and determined that the shock load adds 85% to the weight, a value higher than previously thought. "A good rule of thumb is to figure that you're doubling the load when you start things moving," says Martin. "That happens every single time you start a motor or let it drop." Chain motors aren't the only case to consider-earthquakes are a less predictable but clearly potent source of dynamic loading.

If any doubts remain as to the need for a 5:1 safety factor, reflecting on the risks involved should quickly dispel them. "When you think about rigging," Donovan says, "you're thinking about killing people or not killing them. If you put in just one fitting that doesn't work, or put it in the wrong way, you could kill dozens of people. That fact calls for an entirely different level of concern than plugging a microphone in. If you plug a mic in wrong it's fixable. But most people put the same level of concern into rigging as they do into other things."

What steps are necessary to ensure that you're working safely? "You have to look at every single element in the system," Donovan says, "and make sure you have that safety factor for each one. You may have decreased the strength of a part somehow. For instance, pulling an eyebolt at an angle will decrease its strength. You have to figure out what angles you're pulling and what the strength loss is due to the way you're using it, and make sure you still have a 5:1 safety factor."

It is a basic fact of rigging that the effective weight of a load can increase greatly depending on the angle of the cables suspending it. Take the simplified example of a 1,000-pound load held by two cables. If the cables are the same length, hang vertically and are





Paula Abdul's MSI system, rigging by Harry Donovan. The total weight (lights, etc.) of the recent tour's flown gear was 67,000 pounds.

balanced between the load's center of gravity, each will be stressed to 500 pounds. This seems intuitive enough, until the angles of the suspending cables deviate from vertical. Rocky Paulson of Stage Rigging explains: "With bridle legs of equal length hanging at an angle of 30 degrees with a 1,000-pound load, you have 1,000 pounds of force in *each* leg. If you decrease the angle 15 degrees, it would be roughly 2,000 pounds in each leg. And if you try to make it perfectly horizontal, the load will be an infinite weight." "You have to calculate this load langlel and make sure that even with this increase in force you still have the 5:1 safety factor," urges Donovan. (These calculations become quite complex when dealing with different leg lengths and angles. Donovan carries a palm-top computer running a spreadsheet program to aid in the process.)

"Finally," Donovan continues, "look at the load increase factor from shockloading [an increase of up to 85%, as mentioned above] and make sure you still have the 5:1 safety factor. You'll end up with pieces a lot bigger than you thought. In most accidents, several things go wrong simultaneously. The safety factors are so high that doing a single thing wrong usually doesn't cause an accident usually, you have to do two or three things wrong at once."

With safety in mind, let's turn to a familiar issue-getting your loudspeaker array positioned optimally in the room. "[Touring] sound companies want their speakers in the same place every day," Donovan says. "I'll typically find that it's not safe to get that many speakers up in a certain building, or it's not safe to get the height they want. As the bridles get flatter and flatter, you reach a limit as the tension increases. So between a reasonable bridle angle and the slightly lower beams of a particular building, the speakers are lower than the engineer would like. At that point they'll complain, and the riggers will be under pressure to do things that they think are not safe.

"What happens then depends on personalities," he continues. "How dominant are the sound people and how sure of themselves are the riggers? The trouble is most riggers can't calculate tensions, forces, loads on beams and what those beams can take. All they can do is estimate—'We did this before and it worked'—but the fact that something's worked before doesn't mean it has a 5:1 safety factor. Be-

cause these riggers are guessing and estimating, they are apt to change their minds slightly under a lot of pressure. In some cases, they're doing things that they aren't sure are safe. What's needed is the education so they can do the calculations and tell the sound engineers, 'If we get it two feet higher, it's going to cause 4,700-pound tension on this cable rated at 4,000-pound safe working load, and we can't do that.'" The bottom line? "Don't ask the rigger to do something he doesn't think is safe," Donovan concludes. "It happens



Materials Under Stress

Let's look briefly at the properties of different materials involved in rigging and how they respond to stress and aging. There are different types of stress, but the two most basic are tension (stretching) and compression (squashing). "Both steel and aluminum react the same way," says Andrew Martin. "They don't like compression. An obvious case is a Coke can. You can step on a Coke can and crush it but you couldn't pull one apart with a three-ton press."

Different metals and alloys age differently. "Steel simply loses volume [and, correspondingly, strength] as it rusts." says Martin, "but aluminum hardens with age and becomes brittle and cracks. Take a look at a piece of triangular box lighting truss that's been in use a long time. If you look around all the cross-sectional braces, they're cracked right around the weld, because that's where it flexes. Aluminum trusses have a life cycle of about five or ten years, on average. The more brittle your material is, the more susceptible it is to damage from a shock. So, you can imagine that aluminum is not too good under shock-loading, especially after it's been used a lot, or after it's been tested.

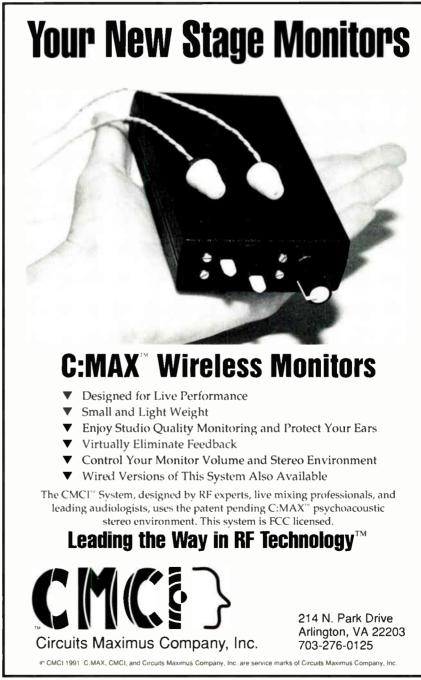
"Concrete does not like tension at all," Martin says. "But it takes compression like crazy. That's why they build highways out of it. When highways fall down in an earthquake, it's because tension is applied to them." Steel-reinforced concrete behaves better under tension, but Martin urges caution. "Concrete is basically something to be avoided from a rigger's standpoint, unless it's a concrete wrapped l-beam.

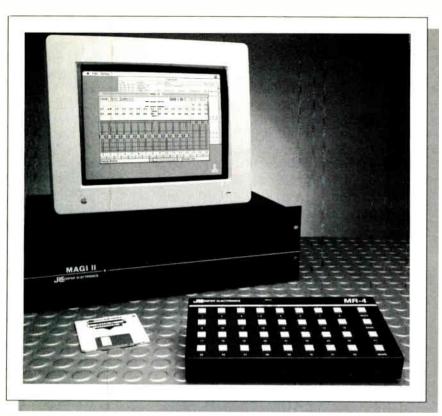
"In a professional venue, you don't see many wood beams," Martin continues, "but you find them in many installs. Wood handles both tension and compression, but the weight rating is greatly reduced. Fastening to wood beams is tough and always should be looked at by a structural engineer-there is no single way to do it. We found that out in a job we bid-we were going to put lag bolts in and when we had the outside engineering done, we found out we had to wrap the beams instead." Of course, wood plays a central role in speaker cabinets, although any flown enclosure should be steel-reinforced. "The cabinet's the weakest link in the chain," Martin says. "Way before any steel will fail, the cabinet will pull apart. It pulls apart in the middle of the cabinet, or two or three inches from the edge. Comers are well braced, so there's less force on the cabinet seams than on the sides."

frequently, and it's a bad idea, because he's liable to do it if you ask him strongly enough."

Behind this interpersonal dynamic looms the issue of liability. Andrew Martin says, "If I'm a sound company and I pay a rigger to hang my points, I'm responsible for what that person does." If the sound company tells the rigger where and how the points should be set up, they're assuming additional liability by specifying how the job should be done. "If you tell them to get the points however they can," Martin says, "the liability issue is somewhat clouded—it has to be decided in court. But you can bet that in any situation, you are at least 50 percent responsible."

Talk of responsibility quickly leads to thoughts of insurance. "If you give any kind of instruction and it's not your profession," Martin continues, "you're in big trouble, and no one is going to insure you on that. For a contractor to get liability insurance is not a big deal it's just a general liability policy. But the insurance company does need to be informed that you are hanging things above people's heads so that they can make a notation on the policy. Most of the insurance writers will overlook that and call it a general liability policy, but



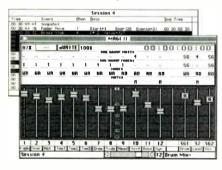


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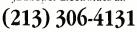
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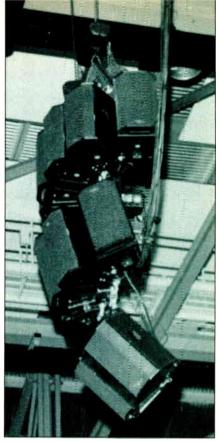
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if it comes to a claim, they'll try to find every loophole they can. In order to protect yourself, you want to make sure [the policy] specifically notes that you are rigging things above populated areas."

The building you are hanging the equipment in also needs to be considered. Most structures are designed to support the extra loads that result from wind, rain and snow, but architects of smaller structures may not have considered the load an average-sized sound system can present to the building's roof. Compared to rigging's 5:1 design factor, building codes typically require far smaller design factors-well under 2:1. "Buildings are not designed to waste the builder's money," says Martin. "They design them as cheaply as possible for the purpose. If a wall and girder system's purpose is to hold up a ceiling, then it will be designed to use the minimal parts and be the cheapest for the builder, which means they are not going to design for any tensional stress las created by flown equipment]. In big venues it is considered, but in smaller facilities they don't consider it." Where any doubt exists, it is necessary to consult with a structural engineer to ensure safety.

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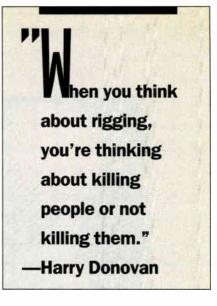


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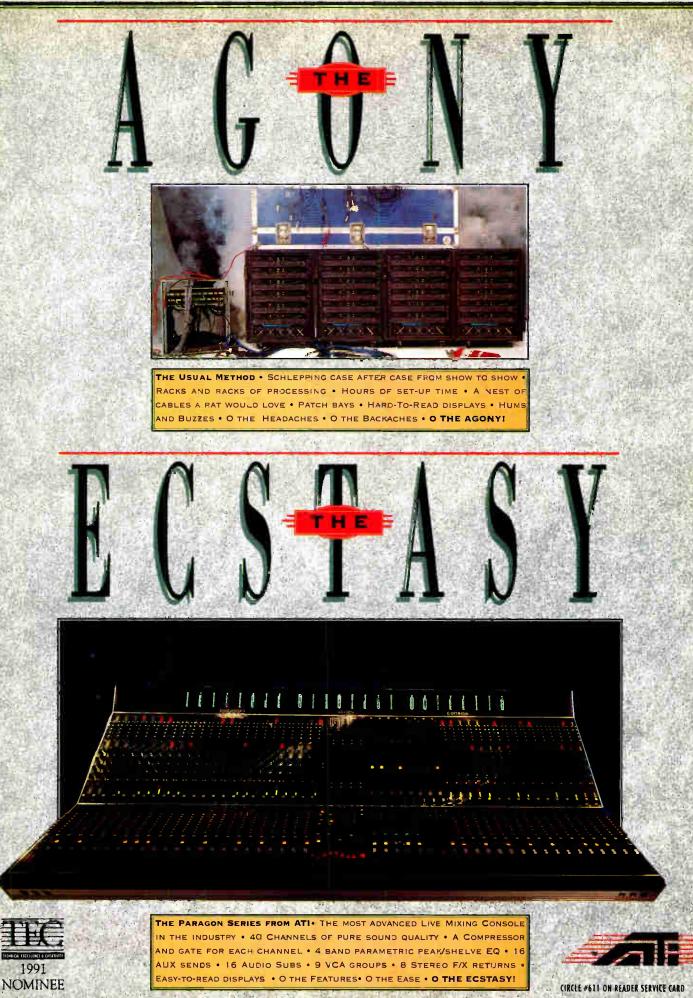
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ing to build their own should follow the same 5:1 design factors. "There are dozens of designs out," Donovan says. "Some of them are extremely flexible and adjustable, and some have no adjustment to them. Some companies have done a very thorough engineering job on their grids, while some have never been tested and are obviously put together by some apprentice in the metal shop. I wish we could convince all sound companies to get their stuff engineered and tested-it's the ones who aren't making that much money who think they can't afford to do it. These companies are also usually the ones with the least training for their people, so they're the most dangerous."

Testing should always be approached with care. Martin described a situation where testing itself caused a hazardous situation. A sound company designed a loudspeaker grid with only a 2:1 safety factor. To test it, they loaded it to 150%. It held, and out the door it went. If the system had a 5:1 design factor, 150% of the grid's safe working load would have represented 30% of the system's theoretical limit. But with only a 2:1 design factor, their test load was actually 75% of the weight required to cause catastrophic failure. Add to that the shock-load when hoisting the rig, and the maximum load could easily have been reached. Stress like that causes permanent damage to the system. "There's a point in any alloy called the yield point," Martin explains, "where the material gets flexed so far that it doesn't return to its original shape. You've changed the molecular structure of that part and weakened it. It's very bad to test something until it starts to bend and then say, 'This is strong, use





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it.' But a lot of people will do that."

"Every piece of hardware has to be load-rated by the manufacturer land be rated] for holding loads over people," Donovan adds. "They should probably also be proof-tested at twice the safe working load so you know there's nothing wrong with it. Some manufacturers proof-test every single piece, some don't test any, some test a few samples from each batch. Standard proof-test is two-fifths of the yield point. You shouldn't test it to anywhere near its yield point, but twice the safe working load [assuming a 5:1 design factor] should be fine."

It's important to note that metal parts will reach their yield point before breaking. The additional force required to reach break point varies, but is often in the 20% to 30% range. All rigging components should be rated for a maximum load, but whether that value represents the yield or breaking point is a particular often omitted by the manufacturer. Finally, remember that testing won't guarantee that the part won't fail someday. Unless a part is tested to its destruction, the test will only prove the part is capable of supporting the weight you've tested it to, and since that point should not be over two-fifths of its maximum, you can't be sure how it will perform under extraordinary conditions while in use.

Finally, safety requires maintenance. which means keeping a watchful eve on all your equipment. "If any equipment shows any kind of abuse or wear, don't take chances-throw it away," says Stan Miller of Stage Manufacturing. "A \$5 fitting or a \$20 SpanSet or \$50 Aeroquip part is cheap. Throw it away." Miller takes the extra precaution of destroying potentially damaged parts before disposal to prevent their re-use. Hoist motors also need looking after from time to time. Wally Blount of hoist manufacturer CM says, "One thing we stress is proper maintenance of the hoists. These are mechanical devices, and they require periodic maintenance and inspection. If people don't do that, it could ultimately lead to an accident."

So, what's a conscientious would-be rigger to do? Those looking to further their education in safe rigging practices have a number of options coming up this summer. The U.S. Institute for Theater Technology is overseeing several independently run seminars on rigging and other aspects of performance facility safety. In June, the Dallas local of the International Alliance of Theatrical Stage Employees will host a seminar in their city. Contact Jim Aman of the IATSE at (214) 388-4741. A similar class will be held in Massachusetts in August. That event is co-sponsored by the University of Massachusetts and Lime Light Productions. Contact Lime Lights' William Beautyman at (413) 298-3771 or (800) 243-4950 for information.

In September an advanced class will be held in Las Vegas, open to graduates of either of the above classes or those who attended previous sessions. Jerry Gorrell at (602) 262-7364 is the contact for that event. Costs for each class vary. but generally hover around the \$350 mark. Gorrell, who is the technical director of the Phoenix Civic Plaza, also happens to be the commissioner of engineering for the USITT. According to Gorrell, the Institute is in the process of developing an ANSI standard for rigging design. The document is expected to be finished within the next three to four years, and will represent the first such standard written.



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ROBERT SCOVILLON DRUM MIKING

by David (Rudy) Trubitt

he drum needs to be tuned properly before a micro-

phone ever gets near it," says veteran engineer Robert Scovill, currently mixing house for Rush. "Once it's tuned, choosing the right microphone becomes easy, because you're tailoring the sound with the microphone, rather than trying to cover up a deficiency in the drum. If you have a great microphone on a poorly tuned drum, miking it only provides a better or worse representation of that badly tuned drum. The sound has to be sorted out before it ever hits the microphone. [Rush's] Neil Peart is superb at





The kit sits on a rotating riser in front of an unobtrusive drums-only monitor console. Ramsa WM-S Series mics are clipped onto small toms and under cymbals. Another Ramsa is in the kick alongside a Beyer M88. A custom enclosure protects the Ramsa mic preamps from mechanical shock. Starting with 12" diameter toms, EV N/D408As take over, as Scovill feels their larger diaphragms better match the increasing head size. Stepping up again in element size, an EV RE20 stands beneath the floor tom. A Countryman Isomax is used on chimes, AKG 414s for overheads and AKG 451s for the hats. A Shure SM57 and Calrec CB20C cover snare top and bottom.



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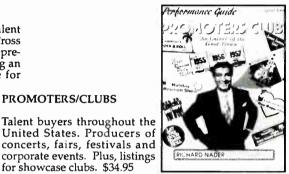
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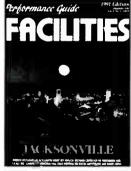
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tuning his drums and keeping them under control."

As is evident in the photo, this is no small drum kit. The sizes of the individual drums, however, are modest. "A bigger drum does not necessarily constitute a bigger drum sound," says Scovill. "How many times have you heard about people coming into the studio with their huge drum kits, trying to get this big sound and failing miserably? Then they go into the corner and pull out a little Camco kit with shallow drums that's been used on every other session, and they end up sounding huge on the record.

"The same thing applies with live work: Try tight miking pat-

terns to pick up specific areas around the drum. Don't use extremely ambient or wide-open sounding microphones, because much of that ambience is destructive. In the studio, [mic interactionl supports the ambience of the room it's recorded in. When it's live, you have to pick specific, precise slices of drums and re-create the ambience of the record electronically."

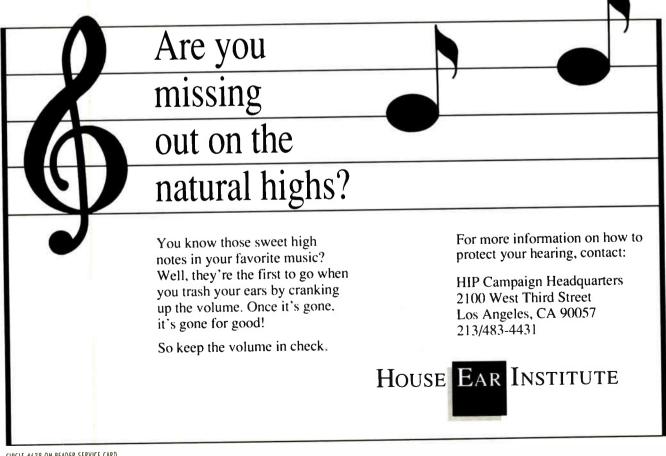
This is Scovill's second tour with Rush, and he did a few things differ-

f the drum's tuned correctly and you have the right match of microphone and diaphragm size to the drum's size, you won't have to do any drastic tone shaping. Use EQ to enhance the fundamentals-the player's attack and the intensity you're trying to create."

ently this time out. "The Ramsa mics [see photos] are obviously the biggest change," he says. "They're a little wider than cardioid, and their off-axis response is really good. It keeps everything out of the back of the microphone, which is important since we have monitor speakers blasting up into the microphones. In a situation like this, the off-axis response pattern is probably just as important as the on-axis. You're trying to keep out as much sound as you're trying to pick up."

But how tight is tight enough? "It's a compromise-you could go to a supercardioid on every mic and end up with a very one-dimensional sound on a tom or a snare drum. That's why the Electro-Voice N-Dym Series work so well: they're tight off-axis, yet still have an open, defined sound. That's why you'll see those mics on probably 70 percent of the kits out there. You don't get a lot of bleed; consequently, it's very easy to gate the mic. You don't have to worry about a lot of cross-triggering or the monitors opening up the gate." Drawmer gates are used throughout.

Another major change for this tour was in the kit itself. Previously, Peart had used two kick drums. "But he wanted it to sound like one drum." says Scovill, "and we tried to do that. Finally, common sense caught up with us and we realized that if we wanted it to sound like one kick, we should just use one drum. The dual kick pedal technology has come around enough for him to feel com-



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P.O. Box 68065 Schaumburg, IL 60168 (708) 884-0514 fortable with two beaters on one drum."

Sometimes finding the right mic for the job contains an element of chance. "I was looking through Rush's mic stash for a good, high-quality condenser to put on chimes and snare bottomthings like that," Scovill explains. "I just happened to pull out a Calrec CB20C with a CT50 capsule, and it was excellent-I swear by it now for snare bottom. It's pointed a little off-axis from the drum head so that it doesn't get so much body out of the drum. It's a light blend [with the top mic] and gated tightly so you don't hear that much of it, but it's really a good-sounding microphone." The snare top? A Shure SM57. "Some things never change," notes Scovill.

Though proper miking is essential, the point where all these mic signals end up is an equally important link in the chain. "If you don't have a goodsounding console with good-sounding EQ, it's a hopeless task," says Scovill. "That's why I choose the consoles I do [Rush uses two Gamble EX56s]. They have an excellent preamp section and excellent EQ. As much as I hate to say it, it all comes back to basics. I'll take a console any day that has three things: great metering, great preamps and great EQ. A console can have all the bells and whistles in the world, but if it can't do those three, I don't want to have anything to do with it. The Gamble is a simple console that is very effective."

How does Scovill see EQ fitting into the process? "If the drum is tuned correctly and you have the right match of microphone-particularly the diaphragm size related to the drum's sizeyou won't have to do any drastic tone shaping. Then you're using EQ to enhance fundamental things, like the player's attack on the drum and the intensity you're trying to create. Especially with Neil, I try to be true to what he's trying to accomplish. I feel selfconscious about smearing what he's doing up there. It's like looking into a blurred mirror—it would be a very false portrayal of what's happening. It's a good philosophy to have with drums: If you try to force a sound on the drum, you're going to fail nine times out of ten. Let the drum come through like it sounds up there and just amplify the vision of that drum."

In the end, it comes down to bringing all of the performance to the audience. "It really bugs me if I go to a show and see some guy up there playing something that I can't hear," Scovill says. "That's probably why I got into this business."

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Regional Companies Speak Out

by George Petersen

To be sure, these are uncertain times.

Last year's touring season was less than overwhelming, with many artists cutting schedules or eliminating roadwork altogether. Now we're in the midst of a bona fide recession. At the same time, artists and managers are getting pretty damn picky about what goes in the riders, demanding state-of-the-art performance at bargain basement prices. Squeezed in the middle of all this is the regional sound company, which must offer top-flight service and gear to handle legs of major tours, while facing increased competition from both national sound companies and the emerging class of smaller newcomers, which are ready to cut prices to get a foothold in the market. It ain't easy.

We talked to a number of regional sound companies, soliciting their comments on upgrading sound systems in these perilous times. Their views were as varied as the areas they hail from.

TURN OF THE CENTURY PRODUCTIONS Janesville, Wis.

ounded in 1979 in Janesville, Wis. (about halfway between Milwaukee and Chicago), this company moved to Tampa, Fla., some years ago and recently returned to its midwestern roots. Turn of the Century's main system consists of proprietary, full-range flying cabi-



UPGRADES



World Ratio History

nets loaded with JBL components. While one of the company's regular gigs is providing sound and lighting for Wayne Newton tours, TOTC has also recently travelled with Bad English and REO Speedwagon. "We're pretty much a 'B' regional sound company," explains owner David Cramer, who adds that the company also does about 200 onenighters a year.

Cramer: "Upgrading depends on what the market will bear. If your gear becomes antiquated and you're starting to get flack from the engineers and production managers, you're forced to upgrade your gear. We've been using a custom-designed rig for the past seven years, but with so many packaged rigs out there now, such as the Meyer and EAW boxes or the Electro-Voice MT-4 system, there's a lot of pressure from engineers to upgrade.

"When things were good—up until about three or four years ago—we would upgrade on a regular basis. We haven't grown as much in the past three years as we did in the prior seven or eight years, so upgrading becomes a cash-flow situation dependent on how many tours are out and how much gear we're renting. think a lot of people will be making last-minute purchases this year. The used market will also be good—we're selling off a lot of used equipment—and there are many people seeking to upgrade to good, highpriced used equipment." —Bob Humphreys

"I don't think the government allows us quite as much depreciation as the equipment actually sees. Fifteen years ago, I bought a PM1000 console for about \$8,800; two or three years later, the PM2000 came out, and I ended up selling the PM1000 for \$1,000. Now I'm worried that the value of my PM3000 will drop because the PM4000 has come out."

THIRD EAR SOUND Richmond, Calif.

ow in its 18th year, this San Francisco Bay Area-based company seems to be doing well, keeping its 40-box system busy on a variety of one-offs and regional tour legs. Third Ear recently added a 40input Soundcraft Europa to its inventory, and, according to partner Raul Suarez, 1991 was the company's best year ever.

Suarez: "From everything I hear, 1992 is starting off well. A lot of people are reporting that they've had only a very small drop-off during the winter, and there seem to be a lot of inquiries about tour starts. Record sales were apparently good during Christmas, and I'm not terribly worried about it.

"Upgrading is based on the 'aaaarrrgh!' factor. First it's, 'Aaaarrrgh, I don't have enough equipment to service all these shows,' and then it's,



'Aaaarrrgh, I don't have enough money to buy anything,' and then it's, 'Aaaarrrgh, I hope I have enough business next year to cover all of this.'

"In the short term, we sub-rent to cover our needs. Then every six months or so, we take a look at how much money we're spending and why we spent it: Were these windfall events, or will these be regular, return customers? We plan on investing that money in ourselves, rather than somebody else. Depreciation isn't really a factor in the decision, but return on investment is.

"We figure out our projected needs on a year-by-year basis, divided into different categories-whether we need more speakers, more amps, monitors, consoles, microphones-and then we determine our weak and strong areas. It depends on what the makeup of our current clientele is. Usually we look at things in a sense of adding inventory; this year we're looking at it in terms of updating and changing inventory, possibly making a major changeover in our speaker systems. We have an old Harbinger system that has been modified extensively, and we've been looking at the Adamson system or possibly the new JBL system. We haven't decided if we'd keep the Harbingers as a B system or liquidate them-it all depends on our business level and how much cash we have available.

"The decision to buy the Europa came from needing a new console and being intrigued with what it had to offer and wanting to be on the front-end of a new console. We had looked at a number of other boards: the PM3000, a couple of used Gambles, the new Midas console and a variety of other things. We decided against used consoles. We thought the PM3000 had been on the market too long and Yamaha would be introducing something new-which they did-and the PM4000 wasn't available at the time we ordered. So we made the conscious decision to be on the front-end of a new piece."



his 12-year-old company handles regional touring for acts such as the Neville Brothers, as well as sports events, concerts and other large gatherings. According to company representative Don Drucker, Pyramid has a large JBL system and is active in beta testing products for a number of manufacturers, so it was no surprise that the company was selected to handle a JBL promo tour featuring Tower of Power and Scott Page.

Drucker: "We try to budget a specific amount each year for upgrades, which is occasionally offset by a major purchase such as a console, but we're always upgrading.

"We used to filter stuff from our A system down into our B system, but now if something gets to the point where we don't think it's reliable or dependable, we typically just sell it. Besides wear and tear, a lot of upgrading comes from market demands—either keeping up with the Joneses or finding a new product that will keep the company hot.

"This year we've ventured into Intellabeams from High-End Systems [of Austin, Texas]. It's a computer-controlled, movable lighting system that was probably a \$36,000 purchase. This came more from a market demand and to keep us in the limelight.

"Anytime there's a new product released that's outstanding, you should capitalize on it and be the first one to get it. In this particular case, we saw that the Intellabeams system was a really hot item, although it just happened to be in the lighting industry. It's like a Vari-Lite,





CIRCLE #641 ON READER SERVICE CARD

but instead of the fixture moving, there's a mirror that moves. They have replaceable gobos and diachroic filters that change on computer command. It's worked out well for shows that need a little flash and also for corporate shows."

SUN SOUND AUDIO Northhampton, Mass.

ctive with many major promoters in New England, handling arenas, colleges, theaters and summer sheds, Sun Sound Audio is described by VP Bob Humphreys as a "local national touring company." Besides regular venues such as the Great Woods Center for the Performing Arts, the Hartford Arena and Worcester Centrum, Sun Sound Audio handles a lot of industrial shows and has carved out a profitable niche via large-screen video projection system rentals. Sun Sound Audio also assisted nearby Eastern Acoustic Works in the development and testing of the KF850 speaker system.

Humphreys: "This seems to be the kind of year to slide through without investing a lot of money, unless a client demands a new piece of equipment. But there's not really anything radically new—there are some upgrades like the PM4000 and the Midas XL3, which is tailored toward the middle market.

"In general, most people are sticking with the standards. It's easy to have a wish list of the stuff you'd like to get, but it's very hard to rationalize spending more money in an economy and market that's probably going to be fierce.

"I think a lot of people will be making last-minute purchases this year. The used market will also be good-we're selling off a lot of used equipmentand there are many people seeking to upgrade to good, high-priced used equipment. For example, a company may want to move from their homemade box up to an internationally known, state-of-the-art box such as the EAW 850, but they'll get into that market by buying a used system. There's also a strong market for five-year-old PM3000s. Companies can save tens of thousands of dollars by buying older, yet top-line, equipment.

"Everybody is hoping that the business will come out of the gate and get going. The fear of all the mid-sized companies is that the big guys like Maryland, Clair and Showco are sitting around, ready with huge numbers of systems. Normally, they're out doing their Michael Jackson or Stones tours the big, big tours—that suck up a lot of equipment. Right now there aren't a lot of major tours going on, so all that gear is available to compete with the midsized companies. There will be some fierce competition from the majors.

"It's always been like this in the audio industry-at least for the past ten years. People are technology crazy; they want the new stuff, but rarely are they willing to pay. Look at the rental rates from anybody in the business. When you show this to anyone in the business world and tell them what you're making, they laugh at you. The amount of return you get on equipment is so poor. And there are a lot of sound companies these days; I hate to say it, but even in our own market, with the KF850 systems that we helped develop, it's gotten to the point that the uniqueness is gone and now you're competing against your own friends. It's scary."

Mix products editor George Petersen started doing live sound work in Europe 25 years ago, where he learned that the Italian word for hi-hat is "charleston."

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Kunnin Sound Compan

by Gregory A. DeTogne

Illustration by Gordon Studer



rying to run a profitable regional sound company in these days of retrenchment and economic malaise may be a strange notion to some. Despite the pitfalls and obstacles, there is still a breed of person ready to accept the challenge. After all, if you can stay afloat through the dark of winter and make it into the halcyon days of summer, you may have a shot at the dollars available in touring and on the fair and festivals circuit. It's just a matter of playing the right cards and coming to the realization that this game is also a serious business.

In a simple sense, a regional sound company is one that serves a distinct region. That may sound logical enough, but when you consider that a great deal of the sound companies that do most of their work within a specific geographical area also tour nationally and internationally, definitions become blurred. A more comprehensive description is that a regional sound company is one that may indeed tour nationally and internationally but can also be counted on to take care of the production needs of a specific market. For example, in major metro areas such as New York, Chicago and Los Angeles, there are sound companies that can be relied on to handle the local market's production needs, whether it's for a Fourth of July festival or a top-name concert tour needing additional help. These companies, regardless of whether or not they've been seen regularly with The Judds in Brazil, are what we'll define as regional sound companies.

It's important to consider from a marketing and legal standpoint what it takes to manage

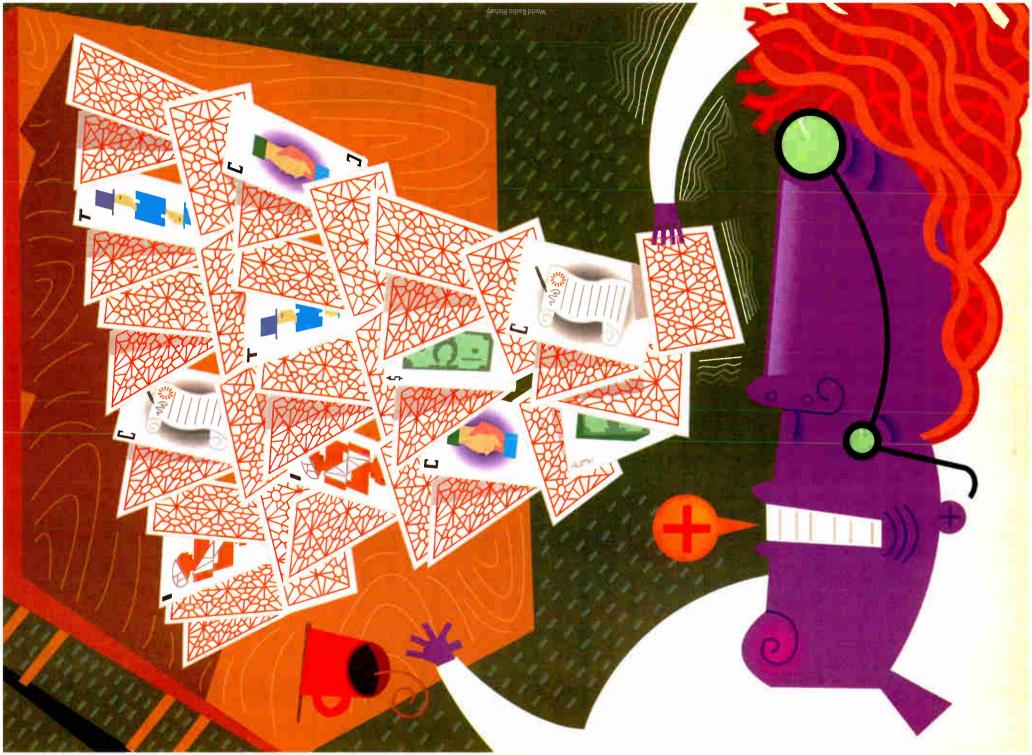


a regional sound company successfully. Let's assume you've collected the necessary gear your sound company will need and have the means to haul it around and store it safely. What's next? Other than searching for paying clients, you should look into the matter of contracts.

According to Bill Hosch, the logistics manager of Dallas-based Bernhard Brown Inc., a good contract has saved him from many problems. "With a good contract, you can avoid billing questions, labor disputes, payment problems and all kinds of impromptu field negotiations," he says. "Our contract, which was drawn up by a lawyer we keep on retainer, has performance guidelines, an equipment schedule, payment schedule and exhibit after exhibit of what the client is paying for and what we're sending. It's not a document written in incomprehensible legalese, but it definitely lays all the cards on the table."

Bob Walker of Brisbane, Calif.'s Sound on Stage thinks of a contract in anatomical terms. "A contract is like a skeleton, the bones of a deal," he says. "When you talk about a contract, you're talking about the relationship between yourself and the client, how





you perceive your services, what the client wants and how you'll respond to those needs. Once you've established these things, then you send out the paper. It needs to be a good contract,

presentable and readable, with all of the information the client needs to make a decision. It also has to have the nuts and bolts spelled out."

Detail is vital to a contract. For example, the number of stagehands to be provided by the promoter should be written out, along with elements such as the times of day for load-in, load-out, the soundcheck and when the final payment should take place. If a

deposit is required, specify the amount, the type of funds and the date and time of payment.

"The worst thing that ever happened to me was when we failed to specify at what time during the day of the show the final payment was to change hands," Hosch adds. "The client wanted to pay after the show, and I maintained that we traditionally collect after soundcheck. That way, if we don't get paid, we can hold the show until the check shows up. In this case, since it wasn't carved in stone, we were forced to go along with the client. Finally, while we were loading the trucks, the payment came, and it was \$1,500 short. At that point, we had no viable recourse, since that was all the client was willing to give us. It was simply another \$1,500 tuition payment made to the college of hard knocks. Ironically, the show was a fund raiser for a charitable organization featuring an internationally known artist."

If properly worded, a contract can be invaluable for settling disputes, regardless of whether the friction is caused by events outside of anyone's control (i.e., the truck didn't get there because of an earthquake, flash flood, blizzard,

etc.) or involves litigation. In the latter instance, specify the physical location in which litigation, if required, will occur. Any court action that takes place outside of your home state will be costlier, given the facts that you'll spend time and money traveling and have to hire an out-of-state attorney.

All caveats aside, is there any time you don't need a contract? Sure, a lot of business is still con-

ducted the old-fashioned way with a smile and a handshake, but it's strongly advised that you save those types of deals for long-standing clients with

whom you have a good relationship.

With a signature on your contract and a deposit check in hand, it's time to pack the truck and start rolling, right? Well, not yet...Both the truck and your employees and ev-



sageneral rule, you can never have enough insurance. Jack Boessneck, director of sales and marketing at

ery other facet of

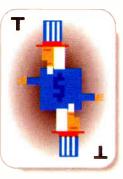
the business need

insurance.

Cleveland's Eighth Day Sound, strongly agrees. "It costs us somewhere in the neighborhood of \$6,000 to \$15,000 per year just to maintain \$2 million worth of liability and comprehensive insurance, and that may not be enough, given the way juries have handed out punitive damage awards recently."

Boessneck also uses insurance as a sales tool, especially in bidding situations. "If I'm bidding against someone for a job, I always make it a point to ask the client how much insurance my competition has, including workman's compensation," he says. "There have been times when the amounts we carry have made a difference in getting the job. After all, if a sound company is underinsured or uninsured, insurance shouldn't become the client's responsibility. I'm responsible because I'm the one who's in business, and I don't know of any business that would suspend several thousand pounds over a crowd of people and not carry insurance."

e've seen that if anything's certain in this business, it's the necessity of con-



tracts and insurance. There is another certainty, and that's taxes. A handy and obvious guideline (useful in preventing the IRS from examining your tax file with a microscope) is to remember that for every dollar you

ment will want a piece of it. Save accordingly, pay on time, and things will run smoothly. Other areas of taxation are more nebulous and vary from state

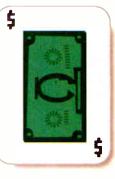
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to state. A quick-witted accountant can help you take advantage of every break possible.

Whether you choose to own or lease your equipment can also have taxation repercussions. "In order for leasing to be tax advantageous, it has to be a true lease," says Gary Mathews of Quickbeam Systems Inc., a regional sound company based in Albuquerque, N.M. "A true lease enables you to write off the entire amount of the lease, which can be good for some. The problem with a true lease is that you'll never actually own the equipment, which means all the money spent on the lease is useless when it comes to building assets. If you're not interested in building assets, a true lease is the way to go. Here at Quickbeam, we generally use lease/purchase programs, which allow us to gain a few tax breaks by amortizing our payments on a schedule, similar to what can be done if you buy a piece of gear outright. At the end of the lease, we usually make a final payment, and the equipment is ours, thereby becoming a business asset."

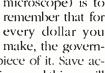
But if you own the equipment, what happens when it becomes obsolete? "Obsolescence isn't really a problem when you own," Mathews explains. "We have components in our shop that are 20 years old, and we still use them. We don't use this stuff for our main gigs, of course, but it still gets around. Even-

tually, we may sell an older piece we never use, but then we have to pay a capital gain tax if we don't reinvest the money we make."



Uompared to some of the pa-

rameters mentioned above, pricing seems to be a more ambiguous though no less crucial aspect of a well-run business. How do you set pricing? Bernhard Brown's Bill Hosch feels that voodoo may be a factor. "Pricing is probably something everyone wishes they had some magic formula for," he confides. "Sometimes it seems like voodoo. We'll submit a bid and it will match all of the others almost to the penny. At other times, we're significantly lower or higher. Usually, however, our clients tell us that we're really close to the price structure of the competition. The only reason I can give for this occurring is chance."



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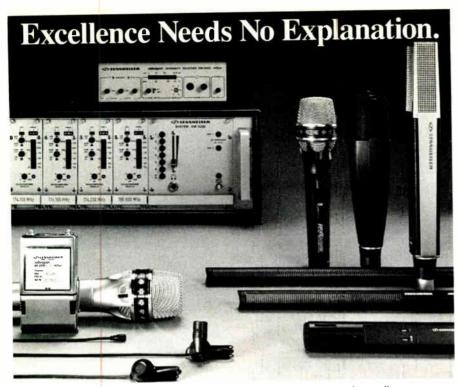


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If we remove the voodoo factor from the equation, however, logic tells us that it still costs every sound company the same amount to move from point A to point B, labor is generally the same price, and everyone's gear costs equally as much. That being the case, can a universal formula be applied to the pricing dilemma?

"It's not by accident that everyone seems to have the same price," says Al Holman of United Sound Associates USA, based in Yakima, Wash. "From my point of view, pricing should boil down to two components: how much you want to make on the job, and what your expenses are. Clients do have budgets, and you naturally want to stay at the top end of their range, but if a promoter you've been doing business with for 15 or 20 years tells you that they need help on the price of a certain gig, you'd better be prepared to make concessions. In relationships like that, you know you'll make it up down the road."

Bob Walker at Sound on Stage takes a straight-ahead approach to pricing. "Anyone who thinks a client doesn't know what the costs are is a fool," he states flatly. "And anyone who thinks the competition doesn't know what the costs are is also a fool. When I set pricing, I want the client to know that they're getting a fair deal. You can't just keep marking prices up—then the client will think that they're being gouged, and

that's certainly no way to build confidence."

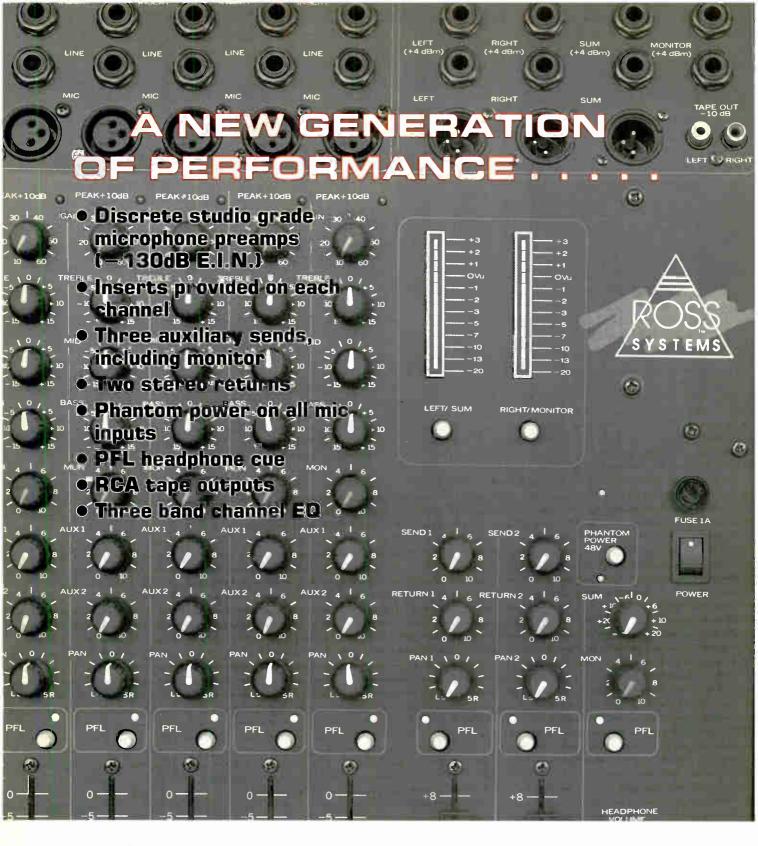
Duilding client confidence is crucial, as are many other aspects of maintaining good client relations. Pro-



viding good service is the best way to keep a client happy. "A lot of smaller companies don't even realize what service is all about," Eighth Day's Jack Boessneck says. "You can get great gear anywhere in the country. What you can't get is good service, and that takes on many forms. Appearance is an important service factor, not only the appearance of the gear itself, but also of the crew. If I'm doing an industrial, I'm not going to send crew members wearing the latest heavy metal T-shirts. To keep the gear looking good, we continually maintain everything. Sure, we have components that are a few years old,

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but we make sure they look like new when they leave the shop. Service also means taking care of the details. When clients use one of our consoles on tour, they can expect to open the box and find that it's all laid out, labeled, and so forth. That's what service is about, giving clients a little bit more than they expect to pay for."

ealing well with your staff is also important. It almost goes without saying that fair treatment and pay are crucial, along with providing good working tools and equipment, plus benefits like workman's compensation or health

insurance. Keeping morale high benefits everyone as well, and a large part of maintaining team spirit depends on what kind of players are on the team.

For Al Holman, good employee qualities start with a good disposition and sense of humor. "We all enjoy our jobs and like to have fun while we're working," he says, "so it's important that new employees have the same outlook. Outside of that, people we employ

Holman says, "Constantly maintain your work load by working colleges, community Christmas festivals, industrials and anywhere else that generates cash flow. That way you'll stretch the big dollars you made in-season further. You should also stretch the borders of the region you're working. Keep looking for the next biggest town where there's work. Also, don't pigeonhole yourself into thinking that you just have to do music. Think of all the opportunities available in politics, theater, at churches and so forth. Don't be afraid of doing permanent installations either. We've been doing well as of late with sports bars and churches."

Sound on Stage also takes on differ-

on't put yourself in a survival mode. **Constantly maintain your** work load by working colleges, community Christmas festivals, industrials and anywhere else that generates cash flow. That way you'll stretch the big dollars you made in-season further." -Al Holman

ent work during the off-season. Corporate work they've landed includes jobs with IBM, Apple and Kawasaki. "The real difference between a touring company and a regional company is that a regional company can find work in the winter that doesn't happen in the summer," Bob Walker emphasizes. "Besides the corporate things we do, we've developed a subsidiary company called California Cases that makes road cases in the same shop we use

to build our own sound systems. All of this helps us get through the winter."

That, in a nutshell, is what it takes to run a regional sound company. Is there any last bit of wisdom from our experts? "Once you get yourself going, you can't survive for very long by thinking about one account as the real money maker," Walker says. "If you want to be around for a while, you have to look at things in the long-term, and treat everyone the same so that they'll come back. Your business will be built by satisfying one client and then another. The satisfied clients will recommend you to someone else, and then you'll have another client. You can advertise and promote yourself in many other ways, but wordof-mouth is what works in this business, and nothing else."

Gregory DeTogne is a publicist and freelance writer in the Chicagoland area.

need to have certain motor skills and physical abilities to take care of the heavy work, and they have to be able to relate to others on a one-on-one basis. Relating to people like that means you have to know how to have a good day even when everyone else isn't, and you have to know how not to make everyone else's bad when yours sucks."

A good way to find employees who are right for your company is to try people out temporarily while working short-term jobs. Based on their performance in these situations, you'll be able to decide whether or not they'd be suitable for a full-time position.

Employing people full time naturally assumes that your company will have work yearlong, which means surviving the winter successfully. How can you make it once the summer season is over? "Don't put yourself in a survival mode,"



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The SR4700 Series is pure pro audio. Pure JBL components, the same caliber as those in our larger systems, including the Vented Gap Cooling¹⁴ low frequency drivers and the 2445J compression driver. Pure JBL enclosures, five times stronger than traditional designs, and protected by plastic-coated steel grills and superdurable fabric-laminated plywood cabinets. Pure JBL sensibility, interlocking enclosures with heavy-duty steel handles and recessed input connectors, so they travel tighter, set-up easier and last longer.

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