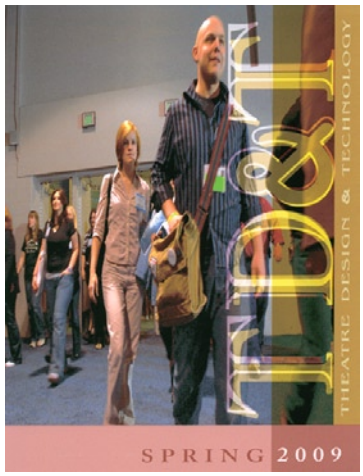

Hair TODAY, HEAR TOMORROW

by Richard K. Thomas

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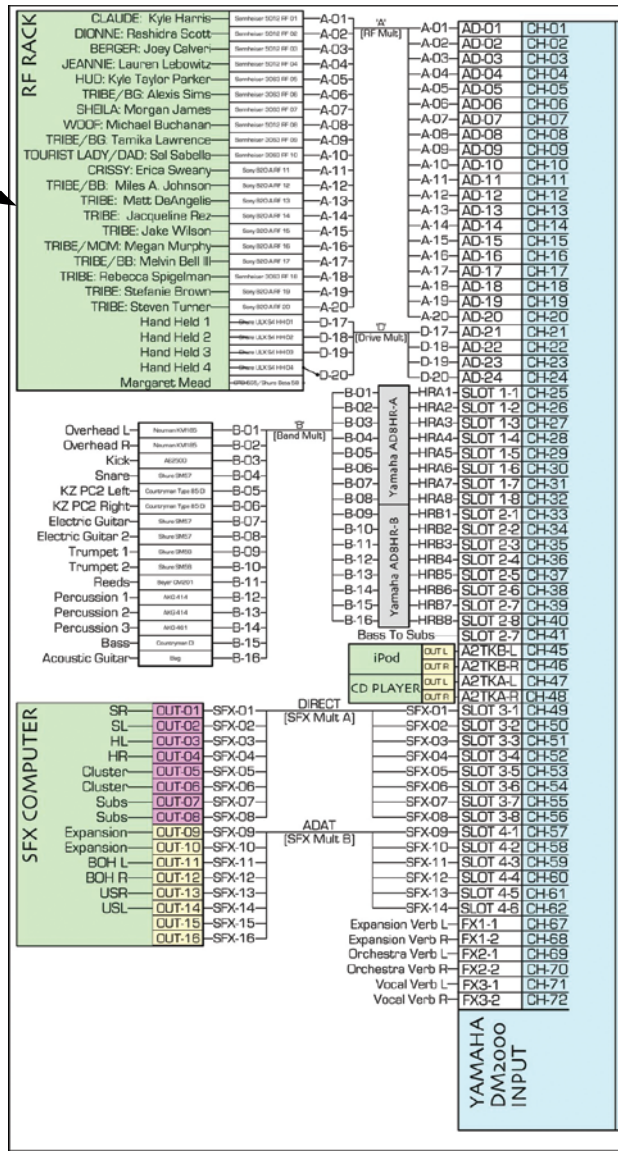
fair TODAY, HEAR TOMORROW

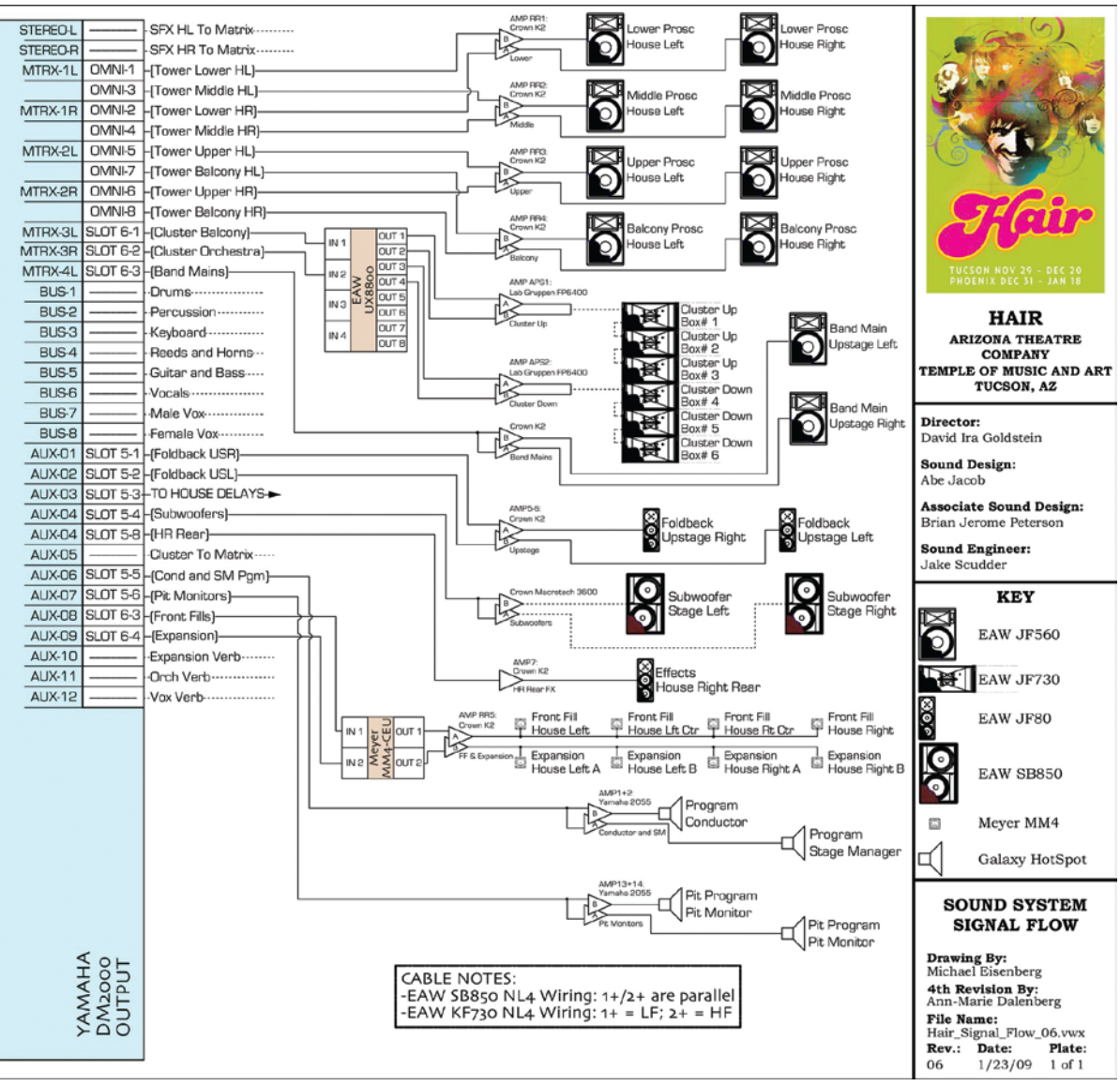
BY RICHARD K. THOMAS



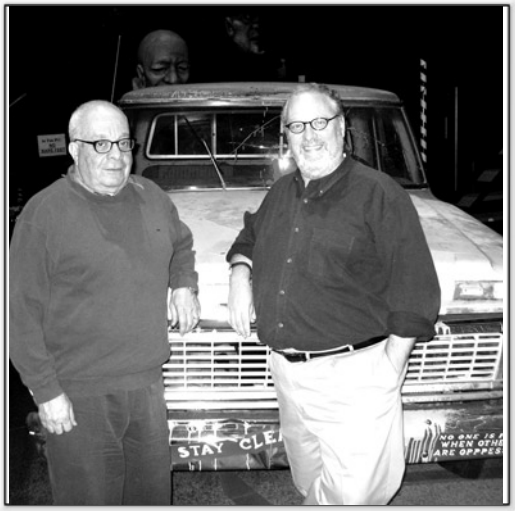
The company of Arizona Theatre Company's production of *Hair* (2009).

PHOTO BY TIM FULLER

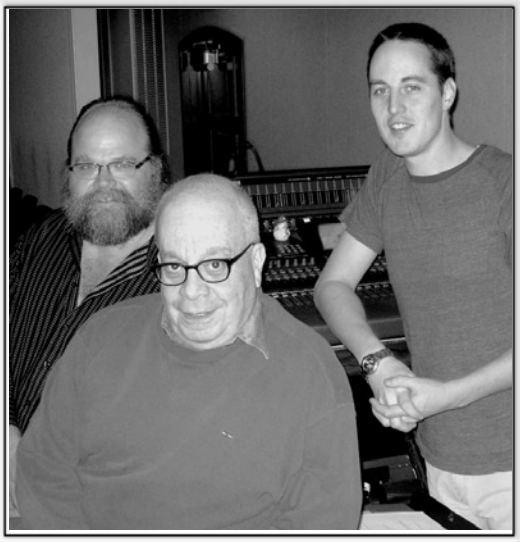
Forty years after the original production survived insurmountable odds to become a smash hit on Broadway, *Hair* is drawing new and old audiences back to the theatre. For Abe Jacob, a long association with *Hair* that started with the original in 1970 has brought him to a new production in his home state of Arizona. In December 2008 and January 2009, Jacob designed sound for the Arizona Theatre Company's (ATC) production that played in Tucson and Phoenix. Jacob's design provides a perfect opportunity to take a look at the evolution of the sound reinforcement design art form, from it's modern inception in the Broadway musical *Hair* to it's present incarnation in ATC's production.



Abe Jacob's system block diagram provides an interesting study in how he understands the needs and limitations of a regional theatre venue and works hard to get the most out of a modestly priced sound system. "I come back to Arizona Theatre Company," Jacob said, "and I know the system that's in here, and what's available, and what the budget will allow, and try to work within that framework, and that's where the design comes in—taking what you are given and making it work for the concept. The only thing we've added here is the center cluster for the line array rather than the old cluster that we've used for other productions, and additional radio microphones."



For Abe Jacob, perhaps the best part about designing a new production of *Hair* was being able to work at Arizona Theatre Company in an environment in which he felt extremely comfortable. At the top of his list, was the opportunity to collaborate with director David Ira Goldstein. Photos by the author, except as noted.



Jacob also enjoys working with a veteran sound crew—sound supervisor Brian Peterson (behind Jacob on the left) has worked with Abe for about eleven years; Jake Scudder (on the right) first mixed for Jacob on his 2007 production of *The Pajama Game*.

Jacob first started working on the Arizona Theatre Company production while mentoring another production of *Hair* at Purdue University in March of 2008. During this period he rekindled the connection between the truth of performing the piece, and the transparency of the sound system: [In performing *Hair*] "you have to be very real," Jacob said. "If you are very real onstage, in all of your dialog, and songs and actions, it will translate to the audience, and then the audience will absorb what you're giving them, and the tribe needs to express it back to them."

To allow this natural style to communicate to a modern audience, Jacob felt he must overcome the limited technologies of the much simpler period of the late sixties and early seventies: "Technology was much simpler. We had no mega-spectacles like the ones we've become accustomed to in the last ten to fifteen years. So you now have to make it sonically, at least, like the other musicals of today."

For Jacob, the major challenge in revisiting this legendary Broadway musical was to achieve a delicate balance between being true to the fundamental nature of the original production and adapting it to its twenty-first century audience's expectations. In the ATC production, Jacob worked to balance modern audience expectations for sound with trying to keep the realism and the truth of *Hair: "*That's why we're using the body mikes on everybody," he explained, "and amplifying the band—things that we never did before—just to give it the same impact to get the same feeling across. I think that's the major difference."

Not surprising then, Jacob's design for this 2009 production of *Hair* fits his late career style perfectly: "I have now come to the conclusion after all these years that the best sound design in theater must be invisible and transparent" (Thomas 2008, 83).

Not every moment in *Hair* deals in raw realism. While Jacob notes that the characters of Claude, Berger, and Sheila must remain pretty realistic in their amplification and treatment, characters like Hud and Woof, and scenes like the trip and hallucinogenic sequences can be explored vocally both in amplitude, and through the use of reverberation and surround sound. Technical advances in sound reinforcement allow Jacob and the ATC production team to find that balance between the natural connection to the audience, and delivering the aural experience expected by a twenty-first century audience, including big spectacular explorations in sound design.

The smaller size of the Arizona Theatre Company venues (633 seats) compared to Broadway houses is also very conducive to a very natural sounding production. According to production sound engineer, Jake Scudder, "We don't *have* to amplify to get it heard by that many people in that open space. And so, I think the approach is to make it more natural sounding, and focus a little more on sourcing to the actor instead of to a speaker. But at the same time we still have plenty of rig to make it a rock show.

Loudspeakers are located throughout the stage and the auditorium, as one might expect in a modern sound reinforced show. But even here, Jacob tends towards the discreet. Scenic Designer John Ezell liked the look of the front fills, even after he recessed them to make sure actors working the front row didn't bump into them. But Abe still lobbied to cover them in acoustically transparent material. He didn't want the audience to be aware of when the loudspeakers were working: in sound, sight can really prejudice the audience.

Tuning the Sound System

Creating a balance between the very natural production style demanded of *Hair*, and a modern audience's expectations of what a "rock show" sounds like places its own demands on the production. Jacob points out how much the rehearsal process has changed to accommodate the increasing technical demands: "It just takes longer now because you have more toys to play with: scenically, lighting wise, costumes and all; more things to synchronize. In the 1970s, a normal Broadway touring show started loading in on a Monday morning, and you did a preview performance Tuesday night and opened on Thursday. And so, we're still finishing up, putting on the finishing touches and that sort. Broadway shows today can get a six month load in and preview period, which is one of the reasons it costs so much to do a show."

A good part of that time is spent tuning the sound system. Creating a natural yet reinforced sound for a modern *Hair* requires careful attention to making sure the sound coming from each loudspeaker arrives at each member of the audience at precisely the right time. Brian Peterson, Jacob's associate and ATC's resident sound designer, used Smaart software to calibrate the precise delay needed for each loudspeaker. Jacob uses the plaster line as his reference, and delays the signal from each loudspeaker to arrive at the audience slightly after natural acoustic sound arrives from an actor standing at the plaster line. This helps the audience localize the sound to the actor rather than the loudspeaker, and helps to increase the illusion of the invisibility of the sound system. Modern digital consoles provide the powerful ability to store all of this information, and to recall it with the push of a button for every different scene. If an actor moves well beyond the plaster line (e.g., the upper levels of the scaffolding), sound board operator Jake Scudder can program new delays into the digital console, and recall them at the push of a button. While Jacob was keenly aware of the problems of signal misalignment in his early career as a Broadway designer, the tools to do something about it wouldn't become readily available for another thirty years.

LOUDSPEAKERS

The workhorses of the loudspeaker system are the EAW JF560 towers on either side of the stage (pictured at left). These feed the music, vocals and effects to the audience. Each tower is comprised of four loudspeakers, each covering the main floor front, main floor rear, balcony front and balcony rear, respectively:

The center cluster is an EAW 730 line array that provides only vocals to the entire audience. Actors monitor the band through two EAW 560 cabinets that provide the same signal to the audience.

The band monitors the vocals and each other through EAW JF80s. Bass and keyboards are taken direct with much higher quality direct boxes (Countryman Type 85), than the simple transformers Jacob used in the original.

The surround system is provided by Meyer MM4 loudspeakers, which Jacob refers to as "Expansion loudspeakers" that allow Jacob to fill the room with a feed from the reverb returns when needed. These are the same model loudspeakers that Jacob uses for front fills.

PHOTO BY TIM FULLER

The full cast on the pipe scaffolding in Arizona Theatre Company's production of *Hair* (2009).

The same can't be said for equalizing the sound system. Jacob's techniques for equalization, whether it be loudspeakers or actors' wireless mikes has stayed fairly consistent throughout his career—perhaps because his tuning instrument of choice has not changed dramatically in that time: "most of the eq is done by ear between Jake (Scudder) the operator and myself." But realistically, there is a lot more equalization to be done now: "Without radio mikes," Jacob points out, "and without anything other than a third octave graphic equalizer, it was very simple in those days." Jacob just tries to get the main sound system to sound reasonably flat, without obvious peaks or dips in the frequency response. Each wireless microphone requires individual attention.

Miking

The original *Hair* had one wireless mike that was used on just four numbers, *Where Do I Go* (Claude), *Sodomy* (Woof), *Donna,* and *Going Down* (Berger). The ATC production uses twenty-two channels of wireless—everyone in the cast has at least one wireless mike. "In the original production of *Hair*," Jacob recalls, "and even on all the national tours and international tours, we never used body microphones. We got to some hand-miking later on, but we kept it pretty much the same—corded mikes from left and right stage. The difference then was that I was giving lessons in mike technique, so as you move the mike from your mouth, the sound changes in volume and low-frequency response."

PHOTO BY TIM FULLER

Tamika Lawrence, Rashidra Scott and Alexis Sims in Arizona Theatre Company's production of *Hair* (2009).

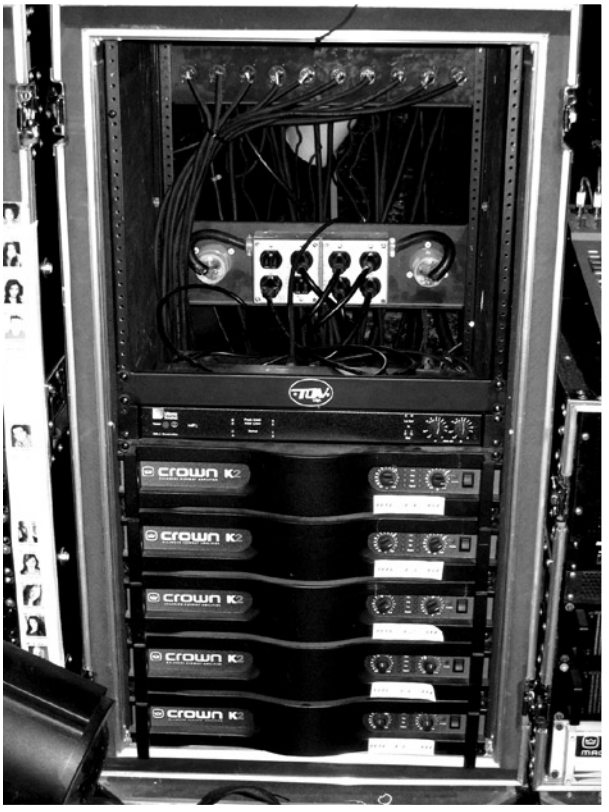
Jacob still provides a few lessons in working with handhelds for the ATC cast: the tourist lady uses a handheld, since she comes up out of the audience, and the Supremes use handheld wirelesses, since they are clearly doing a presentational production number. Did Jacob ever give any thought to using wired mikes to get a "period" feel to the ATC production? "That period feel is in the costumes," he said. "In the original production, it was a practical thing to give them a microphone; we didn't have anything else. So now that we can do without that, it works fine."

In contrast, the miking of the band has stayed very true to the original production. The band for ATC's *Hair* performs onstage just as in the original, although, they are a little further offstage and there is no rake to provide additional acoustic isolation from the performers onstage. But Abe's band miking techniques have stayed remarkably similar over the last forty years.

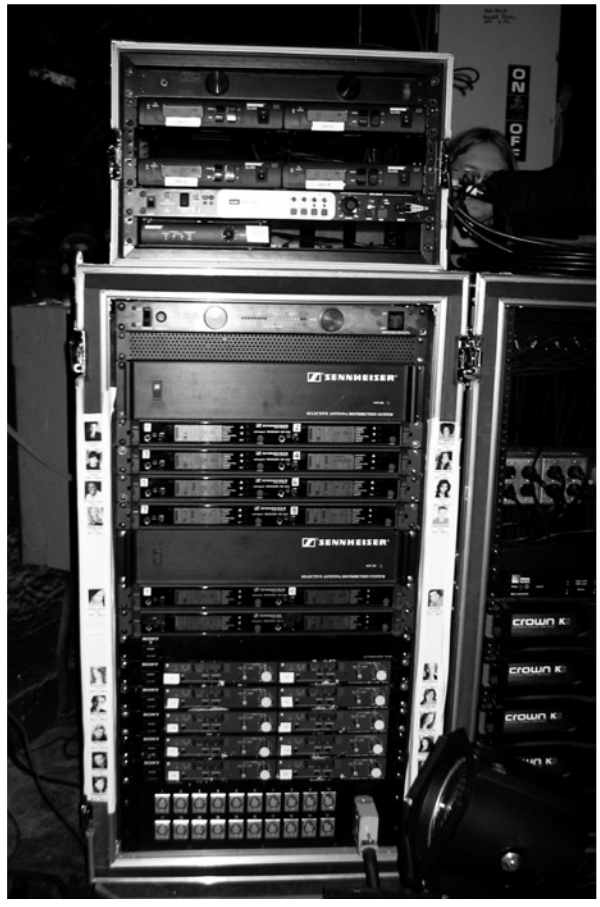
Jacob still uses a minimum technique to mike the drums, now favoring two overheads instead of one (Neuman KM185s), but still keeping a single mike on the kick (Audio Technica 2500), and the old reliable Shure SM57 on the snare.

The band is a mix of the old and the new. One thing that hasn't changed in the forty years of *Hair* (and many other productions) is an old reliable technique for miking guitars: a Shure SM57 hanging down on the amplifier.

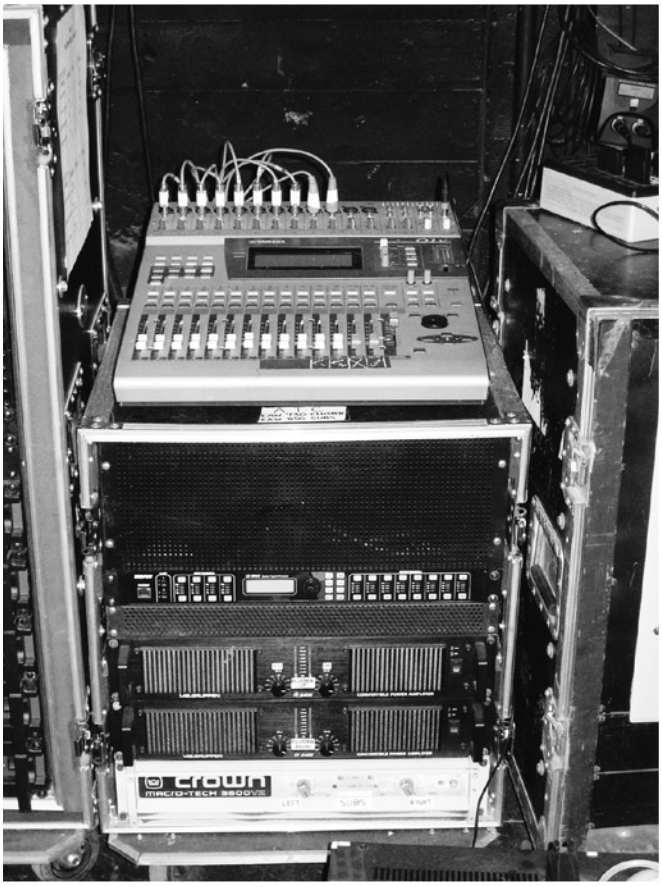
Jacob uses Shure SM 58s for the reeds and trumpets, the same as in the original production.



Amplification for the sound system is provided by a rack of Crown K2 amplifiers placed along the downstage right wall, just upstage of the proscenium.



The actors are miked using ATC's mix of Sony and Sennheiser wireless microphone systems. The elements for the wireless mikes are almost all placed in the center of the actors' foreheads. Because of the nudity and various other states of undress, Jacob places the Sennheiser transmitters in the wig caps whenever possible. This keeps the microphone, wires and transmitter, almost invisible to the audience, as befits Jacob's design style. This technique has become more practical in the last few years as the size of wireless mike transmitters has shrunk. Jacob did, however, somewhat notoriously put the transmitter in Gwen Verdon's wig cap in the 1975 Broadway production of *Chicago*. For the ATC production, Jacob had considered boom mikes, which puts the mike element much closer to the actors' mouth, but found that the combination of good musical direction and strong casting allowed for a more distant pickup: "Chris McGovern, our musical director, has done a terrific job; the ensemble sounds as good as any I've heard. Even in the early days, when we were just listening to them basically acoustically, he's got the harmonies, and the cast is a really a terrific group of singers."



Loudspeaker processing is provided by EAW UX8800s.

Monitors

There are noticeable differences in how the actors monitor the band however, as Abe points out: "Forty years ago, the singers heard, so we didn't have to do band monitors onstage. The band was there and they listened to it. Listened to themselves. Today the hearing ability of performers, as well as audiences, is much less it seems and so you have to give them more monitors. You have to give them band monitors, and the singers want to hear themselves. That's a major difference."

To solve this problem, Abe employs a pair of loudspeakers on either side of the stage, nestled in the scaffolding. Abe does give them something that he normally does not provide, a little bit of their own vocals in the upstage speakers: "In a rock and roll show, you can take those mikes out during dialog scenes so you don't get the reverberation that would occur if you had monitors on while they were trying to talk."

The loudspeakers not only serve as monitors for the singers, they also provide additional localization options for Jacob: he can pull the music all the way down into the side stage towers for a really aggressive rock and roll number, he can lead from the onstage monitors when he wants to pull the sound back some, and he can shift the image over to the band itself. These differences are very small, and are not noticed by the average listener. Instead, they provide an appropriate context for each scene that increases its impact without drawing attention to itself. None of this subtlety could have possibly existed in the original *Hair* production, and in some sense, Jacob's return to *Hair* at ATC may have provided him with the opportunity to do the production he would have liked to have done originally if the technology could have supported his desires.

Mixing

It's hard to believe that Jacob revolutionized theatre sound mixing in the original *Hair* production when he simply instructed the sound mixer to *turn down* the channels that weren't being used, thus increasing the amount of gain in the system before the onset of feedback, and drastically improving the sound quality by not amplifying the ambient noise in the theatre. From those humble beginnings, mixing of a modern musical has come a long way. Today, Jacob mostly wants to talk about mixing with delay, a concept where one can control the localization of a sound source by subtly varying the delay times of the loudspeakers to ensure that the audience localizes the source of the sound to the actor onstage: "That's my localization trick. We just add some more time to Woof when he's singing upstage on the scaffolding, so it kind of draws it back up to him rather than in the loudspeakers. I added a little more delay to his vocal mike in his channel only, so everything of his gets delayed a little more as he moves upstage."

When this happens, the sound system tends to disappear, and the audience experiences that balance of natural sound and sophisticated reinforcement that is the goal of Jacob's design.

All of this wouldn't really be possible without the programmability of today's modern digital consoles. Any time the delay needs to change, sound mixer Jake Scudder simply programs the new delay into a new preset, and then recalls that preset at the appropriate moment in the show. Jacob explains: "The

The mix position is tight, with a Yamaha DM2000 mixer squeezed between the last row of seats and the rear wall of the theatre. The DM2000 has layers of inputs rather than many columns of side-by-side input channels, which make it fit in the tight space. Production sound engineer, Jack Scudder (right) says that mixing sideways is uncomfortable for him only when the levels get so loud that they cause hearing fatigue in the ear facing the stage—but that is a situation not encountered in an Abe Jacob sound design.

dialogue with Woof, he has the speech from the second level up there, and…I think its 12 milliseconds we're adding to that for the dialog, when they're downstage. There's a console scene change that will take that out, or adjust to where they are."

All of this programmability does not mean that the sound mixer becomes a "go button monkey" however. Sound mixer Jake Scudder paints a picture of a very active mix: "I'm constantly moving and adjusting, and it changes on a night to night basis; this person's a little sick, this person has a lot of energy; it got really cold outside, it got really hot. It's never going to be the same show."

Even at the mixing console, creating an illusion of transparency requires constant attention to subtle nuances.

Hair Today, Hear Tomorrow

There are, of course, many and significant differences between the sound design for the original production of *Hair* and Abe Jacob's new production at the close of the first decade of the twenty-first century. And yet, Jacob's design objectives have remained very much the same: cleaner, clearer, and more transparent:

I think the objective is still the same; it's just how you get there. I mean, it's easier to drive the bus now than it was then, because, you know, we've got automatic transmission. I still want it to have the same impact; I still want it to have the same effect. It's easier now to achieve the things that we wanted to do back then that were a little more technically not possible. We have different reverb units now that we can use, but we can still get the same kind of effects. The world around us has changed. Bringing sound to Broadway was a big change; not as readily acceptable as it should have been back then. Now it is. But no, we haven't changed, we're still giving the impression of cleanliness, an impact of an ability to hear what's being performed, and I think all those same requirements are there. Like I say, it's easier to do it now.

Of course, anyone who has sat down at a fifty-six channel digital desk for the first time might be tempted to argue Jacob's last point. But for Jacob, that modern sophistication *allows* him to do things that were impossible forty years ago. It is easier for Jacob to create these illusions now. The one thing that hasn't changed in forty years is that Jacob hasn't lost sight of his original goal—to provide a conduit for the audience to connect on a deeper level with the extraordinary experience provided by this seminal Broadway musical, *Hair*.

Richard K. Thomas *is a professor of Theatre Sound at Purdue University. This article serves as a coda to his recent monograph,* The Designs of Abe Jacob.

Sources Cited

Thomas, Richard K. 2008. *The Designs of Abe Jacob.* Syracuse NY: United States Institute for Theatre Technology.

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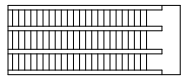

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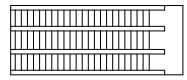

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