



photo by Alec Boehm

WORLDIZING

Take Studio Recordings into the Field
to Make them Sound Organic

By Charles Maynes

For some of us in sound and music circles, “worldizing” has long held a special sense of the exotic. Worldizing is the act of playing back a recording in a real-world environment, allowing the sound to react to that environment, and then re-recording it so that the properties of the environment become part of the newly recorded material. The concept is simple, but its execution can be remarkably complex.

The practice of worldizing started with Walter Murch, who has used the technique masterfully in many films. It has received most of its notoriety from his use of it in *American Graffiti* and *Apocalypse Now*.

In Walter Murch’s superb essay on the reconstruction of the Orson Welles film *A Touch of Evil*, he quotes from a 58-page memo that Welles wrote to Universal to lay out his vision for the movie. At one point, Welles describes how he wants to treat the music during a scene between Janet Leigh

and Akim Tamiroff, and he offers as elegant a description of worldizing as I can think of:

The music itself should be skillfully played but it will not be enough, in doing the final sound mixing, to run this track through an echo chamber with a certain amount of filter. To get the effect we’re looking for, it is absolutely vital that this music be played back through a cheap horn in the alley outside the sound building. After this is recorded, it can then be loused up even further in the process of rerecording. But a tinny exterior horn is absolutely necessary, and since it does not represent very much in the way of money, I feel justified in insisting upon this, as the result will be really worth it.

At the time, Universal did not revise *Touch of Evil* according to these notes, but the movie’s recent reconstruction incorporates these ideas. Worldizing is now a technique that has been with us for some time and will likely be used and refined for years to come.



In *American Graffiti*, recordings of the Wolfman Jack radio show were played through practical car radios and re-recorded with both stationary and moving microphones.

Walter Murch and Worldizing

The practice of worldizing — and, I believe, the term itself — started with Walter Murch, who has used the technique masterfully in many films. However, it has received most of its notoriety from his use of it in *American Graffiti* and in the granddaddy of the modern war film, *Apocalypse Now*.

In *American Graffiti*, recordings of the Wolfman Jack radio show were played through practical car radios and rerecorded with both stationary and moving microphones to recreate the ever-changing quality of the multiple moving speaker sources the cars were providing. On the dub stage, certain channels were mechanically delayed to simulate echoes of the sound bouncing off the buildings. All of these channels, in addition to a dry track of the source, were manipulated in the mix to provide the compelling street-cruising ambience of the film.

In *Apocalypse Now*, the most obvious use of this technique was on the helicopter communications ADR, which was re-recorded through actual military radios in a special isolation box. The groundbreaking result has been copied on many occasions.



The helicopter communications ADR in *Apocalypse Now* was re-recorded through actual military radios in a special isolation boxes.

Sound Effects

In the previous examples, worldizing was used for dialogue or music, but it has also been used very effectively for sound effects. One of my personal favorite applications of the technique was on the film *Gattaca*, which required dramatically convincing electric car sounds. Supervising sound editor Richard King and his crew devised a novel method to realize these sounds by installing a speaker system on the roof of a car, so that they could play back various sounds created for the vehicles.

According to King, the sounds were made up of recordings that ranged from mechanical sources such as surgical saws and electric motors to propane blasts and animal and human screams. In the studio, King created pads of these sounds, which were then used for playback.



Author Charles Maynes found that a squawk box in a trim bin helped him create a distinctive sound for the doomsday machine in *Mystery Men*.

Richard and Patricio Libenson recorded a variety of vehicle maneuvers, with the prepared sounds being played through the car-mounted speakers and re-recorded by microphones. They recorded drive-bys, turns and other moves to give the sounds a natural acoustic perspective. As King points out, one of the most attractive aspects of worldizing is the way built-in sonic anomalies happen as sound travels through the atmosphere.

King also used worldizing to create a believable sound for a literal rain of frogs in the film *Magnolia*. To simulate the sound of frogs' bodies falling from the sky, King and recordist Eric Potter began by taking pieces of chicken and ham into an abandoned house and recording their impacts on a variety of surfaces, including windows, walls and roofs. Using this source material, King created a continuous bed of impacts that could then be played back and re-recorded. For the rerecording environment, King chose a canyon, where he and Potter set up some distant mics to provide a somewhat "softened" focus to the source material. A loudspeaker system projected

the recordings across the canyon to impart acoustic movement.

In addition to this, King and Potter moved the speakers during the recordings to make the signal go on and off axis. This provided an additional degree of acoustic variation. King and Potter created other tracks by mounting the speakers on a truck and driving around, which provided believable doppler effects for the shifting perspectives of the sequence.

Another interesting application was Gary Rydstrom's treatment of the ocean sounds during the D-Day landing sequence in *Saving Private Ryan*, where he used tubes and other acoustic devices to treat the waves during the disorienting Omaha Beach sequence.

Mystery Men

I used worldizing in the film *Mystery Men*, a superhero comedy that required a distinctive sound for a doomsday device called the Psycho-Defraculator. The device could rend time and space in particularly unpleasant ways, yet it was homemade and had to have a somewhat rickety character. I was after a sound like the famous "Inertia Starter" (the Tasmanian Devil's sound) from the Warner Bros. cartoons, but I also wanted to give the sense that the machine was always on the verge of self-destruction.

We started by generating a number of synthesized tones, which conveyed the machine's ever-accelerating character. After finding a satisfying basic sound, we needed to find a suitable way to give the impression of impending collapse. By exhaustively trolling through the sound library, I found various recordings of junky cars and broken machines, and I began to combine them with the synthetic tones. I spent a considerable amount of time vari-speeding the elements but was never really satisfied with the result.

Since this was in 1999, we still had a film bench nearby, with a sync block and squawk box. I remembered how gnarly that squawk box speaker sounded and thought, worldize the synth, that's the answer! So I took the squawk box into my editing room, plugged the synthesizer into it and was quickly satisfied with the distortion it provided.

Then I realized that using the squawk box inside a trim bin might be even better. So in came the trim bin, which became home to the speaker. As I listened, I noticed that the bin was vibrating at certain pitches and immediately tried to find which were the best ones to work with. After some trial and error, I started to put various bits of metal and split reels into the bin and noticed that it started really making a racket when the volume was turned up. I had arrived at my sound design destination. The compelling thing about this rig was that as I changed the frequency of the synthesizer, different objects would vibrate and bang against one another, creating a symphony of destruction. The sound was simultaneously organic and synthetic and gave the feeling that the machine was about to vibrate itself to pieces, like a washing machine during the spin cycle, with all the fasteners holding it together removed.

In the Future

Traditionally, it has been difficult to impart the acoustic qualities of real-world locations to our sound recordings using signal processors and electronic tone shaping, but this may well be changing. A new wave of processors now appearing on the market use a digital process called "convolution" to precisely simulate natural reverb and ambience. Using an actual recording made in a particular space, they separate out the reverb and other acoustic attributes of the sound, then apply those to a new recording.

The source recordings are generally created with a sine wave sweep or an impulse, typically from a starter's pistol, which is fired in the space being sampled. Hardware devices incorporating this technology are available from both Yamaha and Sony; software convolution reverb for Apple-based digital audio workstations (including Digidesign Pro Tools, Steinberg Nuendo and Cubase, Apple Logic Audio and Mark of the Unicorn Digital Performer) is available from the Dutch company AudioEase.

While it seems as though this might be a "Rosetta Stone" that could be used for matching ADR to production dialogue, there are still limitations to the technology. The main one is that the reverb impulse is being modeled on a single recorded moment in time, so the same reverb is applied to each sound being processed with that particular sample. However, the acoustic character of this process is significantly more natural than the digital reverbs we are

accustomed to. This tool was used very effectively to process some of the ADR on Lord of the Rings to make it sound as though it had been recorded inside a metal helmet.

One of our goals as sound designers is to imbue our recordings with the physical imperfection of the real world, so that they will fit seamlessly into the world of our film. We want the control that the studio offers us, but we aim to create a sound that feels as natural as a location recording. Worldizing is one way to do this, and so are the new digital tools that help to simulate it. But sound editors are infinitely inventive. The fun of our job is to combine natural and artificial sounds in new ways to create things that no one has ever heard before.

Charles Maynes is a sound designer and supervising sound editor at Fury and Grace. His credits include Spiderman, Twister, Tomb Raider and U-571.

Special thanks to Richard King, John Morris, Walter Murch and Gary Rydstrom for their patient help with this article.

*Reprinted from
The Editors Guild Magazine
Vol. 25, No.2 - March/April 2004*

[Guild Home](#) | [Magazine Home](#)

Copyright © 2003, All Rights Reserved, The Motion Picture Editors Guild, IATSE Local 700