Sounds in the Key of Life

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A Foley effect helps complete the visual and anchor it to reality.

With music production an increasingly digital affair and countless imaginative choices a simple mouse-click away, it is reassuring to know that one stage of the game, recording, still offers room for true think-it-up-as-you-go creativity. Perhaps in no recording endeavor is that more true than Foley, a delightfully hands-on, shoot-from-the-hip art that thrives in the high-tech jungle of commercial audio.

Named after Jack Foley, who worked at Universal Studios for 40 years as a sound engineer, Foley is the art of creating sound effects for film, video, and other visual formats. One of Foley's more remarkable achievements was his aural enhancement of Stanley Kubrick's film *Spartacus*. To simulate the sound of 10,000 Roman soldiers marching to battle, Foley recorded the sound of large loaded key rings rhythmically jingling — a much easier solution than trying to record 10,000 men walking in unison on packed earth.

Although Foley is most commonly associated with motion-picture sound, its origins date back to the heyday of radio. Today, the art of Foley encompasses sound effects not only for radio, video, and film (including animation) but also for television shows and commercials, computer games, and audio CDs.

In general, Foley sounds accompany movements, typically character interactions with the environment: footsteps, fistfights, a door creaking open, and so on. Usually, an artist performs the movements on a Foley stage, utilizing props and various floor surfaces, while an engineer records the sound direct to picture (while the film is running).

This column will cover technical and creative considerations for recording Foley in the personal studio and provide tips about capturing commonly used sounds. Half of the fun of Foley is in challenging your imagination in addition to your technical expertise. A well-conceived, well-executed Foley track adds immeasurably to the visual medium and also can be gratifying to the recordist. Imagine tromping in a box full of dirt, rattling and pummeling junk, or doing whatever it takes to create the aural illusions required for the production.

THE BIG FAKE OUT

Foley sounds fall loosely within two categories: *analogue* (not to be confused with analog) and *simulated*. The analogue sounds are created by the same means as the movement depicted. For example, to create a Foley effect for a film scene that shows a door opening, it makes sense to record the sound of an actual door opening. (For realism, it probably should be the same type of door.) Although less demanding imaginatively than simulated sound, analogue Foley is equally essential to the finished product.

A simulated sound is one that must be fabricated because it is not feasible to record an analogue event — Jack Foley's jangling key rings instead of an army, for example. The goal is to make the audience think it hears one thing (a Roman army) when in fact it hears another (jangling keys).

Most Foley effects mimic background sounds — those typically on the periphery of consciousness. Such sounds are conspicuous in their absence but must be subtle and convincing to go unnoticed when present. A Foley effect helps complete the visual and anchor it to reality, but it must not draw attention to itself.

LAYING IT DOWN

Basic recording considerations for Foley are the same as for most studio music recording. First, make sure the signal going to the recording medium is sufficiently hot. Second, record the sound as cleanly as possible, without effects. You can manipulate levels later during mixdown and add effects if necessary. The idea is to create clean, solid, consistent tracks so you can give the mixer as much flexibility as possible. Mono recordings are generally preferable because spatial cues inherent in stereo tracks can present problems during mixdown.

It's also helpful, especially for ambience (room) recordings, to record a longer section than is necessary for the scene, leaving a *handle* on the beginning and end of the take. That's because edits may change or the mixer may choose to do fades between scenes. Always keep the final mix in mind while recording; that way, you can give the mix engineer options and make his or her job as straightforward as possible.

Recording formats commonly used on professional Foley stages include Tascam DTRS (DA-88, DA-98, and DA-78, as well as comparable Sony models) and Digidesign Pro Tools. That is good to know if you expect to interact with major recording facilities. But no matter what format you record to, synchronization is essential and almost always utilizes SMPTE time code. (For more information about SMPTE and synchronization, see “Desktop Musician: Synchronicity” in the July 2000 issue, “Square One: Picture Perfect Sound” in the September 1999 issue, and “That Synching Feeling” in the October 1996 issue.)

CHAIN OF EVENTS

To ensure clean recordings, keep the signal chain between the sound source and recorder to a minimum: a microphone and mic preamp are usually sufficient. Both are critical to the success of Foley recordings.

There are three main criteria for selecting a microphone for Foley use. The first is transparency. A mic that sounds great for kick drum because of its huge low end and forward highs is certainly less than ideal for Foley. Choose instead a mic with a flat, extended frequency response and as little coloration as possible.

The second criterium is the ability to pick up detail. Detail is crucial to providing the realism that is fundamental to Foley. For that reason, a condenser microphone is almost always the best choice.

Last but not least is low self-noise. Although certain loud sounds — trains, explosions, or waterfalls — may not require a quiet mic, often the Foley artist is recording ambient and other low-level sounds. Such sounds may require as much as 60 dB of preamp gain to get a sufficient level to the recording medium — enough to make a noisy mic audible in the mix.

Most professional Foley engineers prefer high-end microphones — for example, models made by Schoepps, DPA (formerly Brüel and Kjær), and Neumann (the U 87 is especially popular). Engineer Dave Nelson, of Outpost Film Center in San Francisco, favors the small-diaphragm Sennheiser MKH 40 for his Foley needs. Larry the O of Lucas Digital is a fan of the Earthworks SR77 for the projects he works on at his personal studio, Toys in the Attic. Although that mic is not as quiet as some models, it is reasonably priced and, according to Larry the O, remarkably flat, transparent, and detailed.

The mic preamp should also be quiet, transparent, and detailed, with gain and headroom to spare. Because you will use lots of gain to capture low-level sounds, the preamp must remain quiet even under high-gain conditions. A preamp that sounds quiet at 40 dB of gain when recording a ukulele may not sound so quiet when cranked up to 60 dB to capture the sound of a drip from a water faucet.

Headroom is important, because Foley tracks tend to be extremely dynamic. You need a preamp that can handle a wide dynamic range in one pass, from the tinkle of a wind chime to the slam of a door, without muddling the quiet sounds or clipping on the loud ones.

STUCK IN A PATTERN

Because the Foley recordist may be called upon to record any number and type of sounds, it's nice to have a range of microphones at hand. However, if you can afford only one good mic, a multi-pattern condenser is the way to go. If you can afford only a single-pattern mic, opt for one with a cardioid pattern.

A cardioid pattern is usually best for recording Foley tracks because it helps the mic focus on the object or event being recorded. If room noise is a problem, try a tighter pattern such as supercardioid or hypercardioid, assuming the sound source is stationary. If the source is moving, you may need a wide cardioid or even omnidirectional pickup pattern to avoid unwanted off-axis coloration.

An omni pattern is also useful if you need to position the mic close to the sound source but want to avoid bass boosting from the proximity effect. Just make sure the room is sufficiently quiet so that you don't pick up extraneous noise, and sufficiently dead (acoustically) so that you don't capture unwanted ambience.

QUEST FOR QUIET

Ideally, your Foley room should be soundproof and acoustically dead. Although a large reverberant space could work to your advantage occasionally, a quiet, non-reverberant space is easier to work with and more versatile.

In your quest for quiet, make every attempt to minimize superfluous noise that could interfere with the recording. That includes unwanted breathing; stomach gurgling; clothes rustling; shoelaces flapping; and keys, jewelry, or pocket change jangling. The best solution is to get rid of the noisemaker — by emptying pockets or changing noisy clothing, for example. Sounds that cannot readily be removed should be minimized through careful mic positioning and judicious use of pickup patterns.

Be vigilant, too, about headphone bleed, especially when the preamp gain is cranked high to capture low-level sounds. Also, take care not to make noise with the headphone cable as you move around. You may even need to hold your breath or breathe quietly during a cut or make it a point not to move your body beyond what is required to create the effect.

THAT'S LEFT, RIGHT?

Typically, Foley effects are recorded with a single strategically placed microphone. Stereo-miking would be called for if a scene requires spatial cues, but that is rare. Again, the idea is to grant maximum flexibility to the mix engineer. As I mentioned previously, stereo tracks, no matter how great they sound, can end up creating problems for the mixer; moreover, an intentional mono recording almost always sounds better than an incidental one derived from using only one of two stereo tracks.

Because realism is usually critical to Foley, it would make sense to position the mic approximately the same distance from the sound source as the camera is from the source in the film. In reality, though, that doesn't always work; often, the source, especially a very quiet one, must be recorded at close range and then mixed at a lower level so it sounds as though it is the correct distance away.

The question of realism is generally more of an issue with ambient sounds than with particular sounds (for example, a slap to the face). It's easier to mix a dry recording of a face slap into a large-room ambient track and treat it with effects so that it sounds as though it actually happened in that space than it is to create a realistic-sounding large room from an ambient track that was recorded in a small space. To capture more room sound for a hospital fight scene in the film *Dream with the Fishes,* Dave Nelson chose to pull the mic back from the Foley artists (as opposed to close-miking them). That made the fight sound more as though it happened in the room depicted on the screen.

For some scenes, Nelson suggests using multiple mics to increase mix options. For example, if the actor is walking on a dock, try using a room mic and a boundary-layer mic positioned beneath the walking surface. That gives the mix engineer the option of using either track separately or of blending them together, depending on what best suits the scene.

PLAYING IT SAFE

Take necessary safety precautions when creating sounds with frangible items. For example, wear safety goggles when breaking glass or other materials that could fly into your eyes. When working with powdery materials — dirt,

cornstarch, plants with excessive pollen, and the like — a dust mask is essential.

But don't stop at just protecting yourself; you also have the mic to consider. A quality windscreen and pop filter can help guard against smoke, dust, water, bursts of air, flying debris, and other sources of potential harm to delicate mic elements.

THE DRAWING BOARD

Always do a spotting session before you start recording. In a spotting session, you figure out what sounds you need and where they go based on the scene layout and time-code information. Make a comprehensive list or cue sheet of sounds you need to cover and figure out what surfaces, props, and other items are needed to create those sounds. The cue sheet should also include take numbers, time-code information, and any other notes that might help at mixdown (see *Fig. 1*).

The spotting session is also a good time to decide whether to work sequentially (scene to scene), from one character to the next, or from material to material (for example, recording all the breaking glass for different scenes at one time).
A Foley artist must examine every inch of a scene, accounting for each movement that might produce an audible sound. Attention to detail is everything. Remember that you are creating an aural illusion intended to keep the viewer immersed in the action and convinced of its authenticity; any oversight on your part could break the viewer's suspension of disbelief.

Strive to become one with the characters. Study how they move and feel what they feel so you can convincingly simulate the sounds of their actions. Are the characters depressed and treading heavily? Or are they happy and walking energetically? Becoming a good Foley artist requires not only technical and auditory skills but also sensitivity and a keen imagination.

WILEY TRICKS

The following are tips and techniques for capturing some common Foley sounds. It's up to you to determine what objects to use and to develop good timing.

Walk this way. More often than not, walking is done in place and is later panned in the mix to simulate movement across the soundstage. To help make the gait sound natural, watch the shoulder movements of the character you're mimicking.

Have several types of shoes on hand: leather sole, rubber sole, lug sole, and so on. Foley artist Dian Langlois, of Outpost Film Center in San Francisco, says you can get different sounds from a pair of shoes by covering the soles with gaffer's tape. (You can also tape on false soles.) Langlois also recommends using tape to secure flapping shoelaces, jingling buckles or snaps, and anything else that creates unwanted noise, to avoid random aural contamination that can spoil a take. Also, watch out for squeaks in shoes — unless you want the character's shoes to squeak.

The walking surface you select is clearly critical to your success. If at all possible, use the same material that the person in the scene is walking on. Start with the mic two or three feet away, aimed at the feet (see *Fig. 2*). If the shot is a close-up, move the mic closer. If the scene takes place in a big room, add a room mic to pick up ambience. If the walking is seen from a distance, the close mic will probably sound unnatural, and the room mic alone may suffice.(See the sidebar, “This Is the Pits,” for ideas on building a Foley pit.)

Of the cloth. Clothing rustles every time a character moves, assuming the person is clothed. But even if a character is naked — in bed, for example — his or her body makes sounds rubbing against the sheets.

To get a good recording of cloth sound, start with the mic 6 to 12 inches away. Close-miking helps minimize ambience; however, at such close range, you may encounter proximity effect and problematic fluctuations in dynamic range. Also, watch out for bursts of air if a motion is large or sudden, and if necessary, use a windscreen or pop filter to quell them.

To create a natural-sounding distinction between characters, try using a different piece of cloth for each actor. Another approach is to equalize each character's clothing sound differently during mixdown.

Up in smoke. Exercise caution when creating fire sound effects. The roar of a conflagration, such as a forest fire, is probably best taken from a sound-effects library. If you must record the sound of a huge destructive fire at close range, opt for a cheap sacrificial microphone. You don't want to lose an expensive condenser mic if you suddenly have to tuck tail and run.

Smaller effects, such as the sound of someone smoking or striking a match, are much easier to capture. For a match strike, position the mic about 6 to 12 inches back and shield it with a pop filter to protect it from flying particles. That sound requires considerable gain, so use your quietest preamp and mic.

Street rumble. Creating fight sounds can be lots of fun. Langlois's main fight-scene prop consists of cloth wrapped in leather. She balls up bunches of cloth, wraps them in a leather jacket, and then hits that with whatever the scene calls for. Similarly, to create fight sounds for a computer game, I wailed on vinyl- and cloth-covered cushions with a metal pipe. Hitting thick phone books can also be effective.

Position the mic about 18 inches from the source and adjust the gain so that the loudest hits don't overload the recorder. Fierce poundings are typically loud and may require limiting if you're recording to a digital medium.

Sticks and stones. Celery sticks are frequently used to simulate the sound of bones breaking, and the results can be wincingly realistic (see *Fig. 3*). Larry the O recalls doing a Foley session for a courtroom scene in which a lawyer brandished a severed arm as evidence. Larry the O obtained some juicy beef joints from the local butcher, laid a tarpaulin sheet in the studio, and set up the mic with a

protective pop filter about two feet from the joints. “Someone rotated the joints, making the cartilage snap and break,” he says. “We cranked up the gain so you could hear all the disgusting gristle and slimy stuff slipping around, and it worked very effectively for the scene.” (For more on Foley materials, see the table, “Sound Advice.”)

EM associate editor Brian Knave once simulated the sound of a cat being thrown into a well for a Mephistophelian remake of the children's song “The Cat Came Back.” “We couldn't very well throw a real cat down a well,” says Knave. Instead, he and his music partner, Norm Milstein, created the effect from scratch. For the splash, they recorded the sound of a wet, tightly wrapped towel being thrown into a bathtub filled with water. For the impact, they recorded the same wet towel being flung hard against drywall. Mixed together, those two tracks simulated the sound of the cat hitting the water. For the fall, Knave added cavernous reverb to a mournful cat yowl from a sound-effects library. Although no animal was harmed in the making of the song, it sure sounds as though one was.

In a similar vein, Langlois suggests blending hard effects (those taken from, say, a sound-effects library) with real-time Foley effects to personalize the sound and make it work better for the scene. “Sound-effects libraries typically have doors opening and closing,” says Langlois. “But usually, those can be enhanced, depending on the scene. For example, you can add the sound of the character's hand turning the doorknob. For extra realism, don't forget the sound of the hand coming off the knob — hand on, knob turn, then hand off.”

THIS IS THE PITS

You can construct a Foley pit from plywood and two-by-fours. A practical size is three by four feet with a depth of about one foot to accommodate adequate fill. A rubber mat or piece of foam rubber under the pit helps block unwanted sympathetic vibrations. Also, make sure your pit rests on a solid surface, such as concrete. If it's on a wooden floor or some other suspended base, the microphone may pick up a hollow resonance from beneath footsteps, which could foil your attempts at realism.

You can partition the pit so it is able to accommodate various surfaces simultaneously. Common pit materials include sand, rock, gravel, dirt, tile, linoleum, concrete, and marble. Other handy items include a wooden pallet (to suggest the sound of a stage, dock, wooden stairs, and so forth), a metal grate (to indicate a catwalk, a ship's boiler room, or a spaceship), and a length of chain-link fence.

Foley props provide the real fun. Give free reign to your inner pack rat. Items you've been hoarding may have unexpected sonic value, and so will many things available at junkyards, garage sales, and hardware stores.

Sound Advice

Here are recommended source materials for crating Foley sound effects.

SOUND	MATERIALS	INSTRUCTIONS
Body Hits	phone books, vinyl-covered cushions, leather-wrapped cloth	pound as needed
Breaking Bones	celery stalks, carrots	break to suit action
Footsteps on Leaves, Grass	houseplants, loose analog tape	spread and walk on as needed
Footsteps on Snow	cornstarch, table salt	place on sheet over dirt in pit and walk on as needed
Space Suit	rubber tubing	rub, twist, or crunch as needed
Viscera	paper towels soaked in raw eggs, tuna salad, beef joints	do whatever it takes

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