Earthworks®
PREMIUM
DRUM KIT™
SYSTEM

HDM HIGH DEFINITION MICROPHONES™

USER'S MANUAL

DK50/R DRUMKIT™ SERIES

Earthworks®
HIGH DEFINITION MICROPHONES™

Congratulations on your purchase of the Earthworks DK50/R Premium DrumKit™ System. You will be thrilled with the results you will be able to obtain using the elements of this premium system in miking drum sets. If you have any questions, you may contact us using the contact information on the back page of this manual. Happy Drumming!

Items Enclosed with your New Earthworks DrumKit™ System:

DK50/R *(Recording version)*
2 - QTC50 Omni Condenser Microphones
1 - SR30 Cardioid Condenser Microphone
3 - LevelPads™
1 - KickPad®
1 - Stainless Steel Windscreen for SR30
3 - Foam Windscreens
3 - Microphone Clips
1 - User's Manual
1 - Zero/Halliburton DrumKit™ case

IMPORTANT NOTICE - Please Read This:

Use of the LevelPad™ - The QTC50 overhead microphones have a high output level, which may overload the preamp of most mixers or consoles. To avoid overload, please use one of the enclosed LevelPads™ in the microphone cable feeding each QTC50. Select either the -15dB or -30dB of attenuation for optimum results. The third enclosed LevelPad™ can be used with the SR30 in any situation where it's output is too high for your mixer or console preamps. Using the LevelPad™ in conjunction with the KickPad® with the SR30 on kick drum should not be necessary in most applications.

Avoid Use of Omni Mics on Kick Drum - The SR30 cardioid microphone is designed to be used for the kick drum. DO NOT use the omni QTC50s for close miking a kick drum. The QTC50 has extended low frequency response that goes down to 3Hz and in certain conditions may cause overload or distortion when using the KickPad®. There is a lot of energy (power) at subsonic frequencies. The SR30 cardioid microphone has a low frequency response down to 30Hz which will not pick up subsonic information. We therefore recommend the use of cardioid mics on kick drum when using the KickPad®. This not only applies to Earthworks microphones, but applies to microphones made by other manufacturers as well. Use only cardioid microphones for close miking kick drums when using the KickPad®.

FIFTEEN-YEAR WARRANTY
All Earthworks products carry a fifteen-year limited warranty (parts and labor). If you have any problems with your Earthworks products, please contact our warranty/repair department by email at: returns@earthworksaudio.com or by telephone at (603) 654-6427, Ext. 19.

Miking Drums

There are many ways to mic drums and it seems that most every recording or live sound engineer has their own way of miking drums. Our objective is not to indicate which drum miking approach is better, but to look at advantages and disadvantages of each. Every engineer or producer uses their own methods to obtain the results they desire and that is what matters. Let us look at some of the common practices in miking drums.

Multi-microphone Method

The objective here is to place a separate microphone on either most or all the elements of a drum set. Typically, separate mics are used on snare, toms, sock cymbal and kick drum with one or two overhead microphones. The overhead mics pick up the overall sound of the drums including cymbals, which are not miked separately. With this method, the mixing engineer can control the level, and signal processing (limiting, EQ, etc.) for each element of the drum set. This provides a great deal of control over the entire drum set and allows bringing out certain patterns on sock cymbal, snare, etc. Multi-miked drums may be desirable when you are recording in a large room with high ambient sound. Close miking will reduce the amount of unwanted room sound.

The disadvantages in this approach are interactive phasing problems often resulting in cancellations of certain frequencies, especially when using multiple cardioid microphones. Multi-miked drums typically have a more present and detailed sound due to the closeness of the microphones to each element of the drum set. In contrast, this approach looses the "air" and "openness" that one would hear in a natural setting. As one engineer put it, "close miking drums makes the drum set sound like a bunch of pieces instead of a drum set."

Minimum-microphone Method

There are two old sayings: (1) more is better and (2) less is better. Each is true in its own right, but which is right for you? In the earlier days of recording, fewer microphones were used. When a drum set was miked, it would usually be done with one overhead microphone and sometimes another microphone on the kick drum. When stereo came along, a second overhead microphone was added to achieve a stereo effect. Miking drums in this manner provides a more natural sounding set of drums with more "air" and "openness" in the sound. It also greatly reduces the potential for any phasing problems resulting in frequency cancellations inherent in multi-miked drums. This approach also works best in a good-sounding room without overabundant ambients, reverb or reflections. This method is ideal for use in a studio drum booth or drum room that has been specifically designed for recording drums. Today, more and more engineers are moving toward using fewer microphones on drums. This is especially applicable as newer technologies in microphones can provide startling results with fewer microphones. Earthworks incorporates these new advanced technologies in their High Definition Microphones™.

Earthworks: the New Science in Microphones

David Blackmer, the brilliant engineer who invented the technologies of dbx, is also the inventor and founder of Earthworks. In the last few years of his life, David developed a number of revolutionary technologies that dramatically improve the quality and performance of microphones. In short, Earthworks High Definition Microphones™ will pick up sounds and details that other microphones cannot. These dramatic improvements are in the areas of impulse response, diaphragm settling time and improved polar pattern technologies. Those who have heard Earthworks High Definition Microphones™, say that they hear more attack, more subtle detail and a more pristine quality in the sound than with any other microphones regardless of price. The demo CD of the DK25 Series DrumKit™ Systems should capture your interest in this respect. One of these CDs is included with this manual. Even though you have the Premium DrumKit™ System, we suggest that you take the time to listen to this enclosed CD.

While developing our popular DK25 Series of microphones for percussion, we went into the studio to try them out. We only used two mics for overheads and one for kick drum. When we heard this, it absolutely blew us away. Then we made a comparative recording of the same drum set using seven other mics that are some of the industry favorites for miking drums. In comparing these two recordings, the difference in detail and sound quality of the three Earthworks mics vs. the seven industry favorites was staggering. The Earthworks microphones captured every nuance of sound from each piece of the drum set with such an exceptional clarity and cohesiveness, that it sounded like a live set of drums, not a bunch of pieces. This discovery led to the development of the DK25 Series of DrumKit™ Systems, providing a "dramatic improvement" in the sound quality of miked drums. When we developed the DK50/R Premium DrumKit™ System, the audible improvements were even more incredible.

X/Y Stereo Overhead Miking

While in the studio auditioning our new 50kHz microphones, we recorded in two acoustic environments: a drum booth and an open studio (larger room). When recording drums in the drum booth, we mostly used the X/Y approach to miking, which is shown in Figure 1.

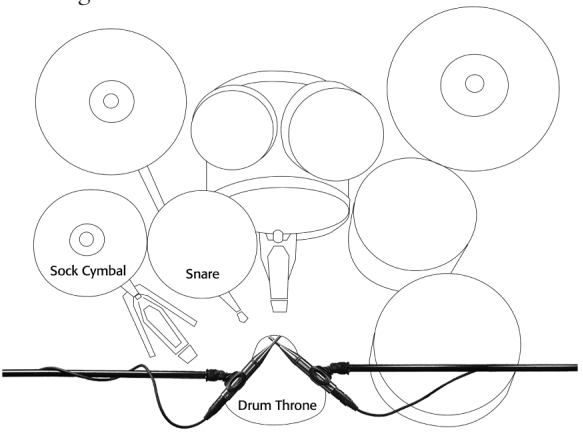

Figure 1. Overhead miking with HORIZONTAL X/Y positioning

In Figure 1 the microphones are positioned about two feet above the drummer's head. This placement will provide excellent results in a drum booth or an acoustically treated small room. If you do not have a drum booth or are in a larger room, you can also use another variation of the X/Y pattern by facing the microphones straight down (see Figure 2). In this case the microphones should be one or two feet above the drummers head and about one foot in front of the drummers face, looking down.

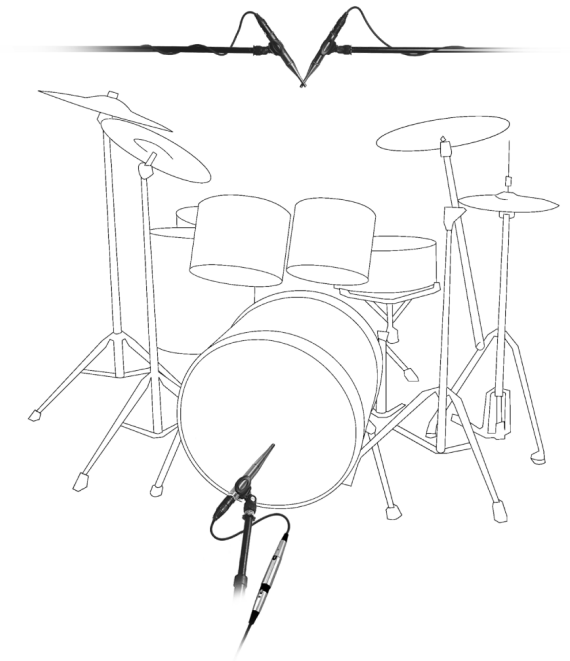

Figure 2. Overhead miking with VERTICAL X/Y positioning

Closer Overhead Miking

There is a closer miking approach that we also used in our sessions. This method would be ideal for those who do not have a drum room or drum booth. Closer miking will reduce some of the ambient room sound while picking up more subtle details of the drum set. This method is shown in Figures 3 and 4. In Figure 3, you can see the positioning of the microphones from a front view and Figure 4 shows where the microphones are pointed. This was the miking technique used on tracks 27 and 28 of the enclosed Earthworks DK25 DrumKit™ System Demo CD. All other recordings of the drum set on the DrumKit™ Demo CD were done using the horizontal X/Y positioning shown in Figure 1.

Figure 3. Overhead miking in downward position

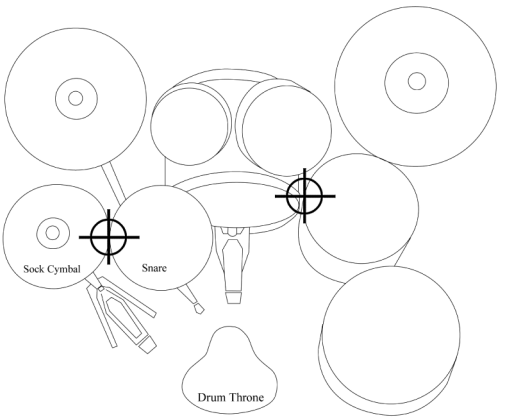

Figure 4. Overhead miking aiming positions for Figure 3

All of the microphone positionings shown in Figures 1-4 should provide excellent results using the Earthworks DrumKit™ three microphone system.

If you prefer the sound of multi-miked drums, then using one of these positionings in Figures 1-4 for your overhead microphones will provide terrific results. You can hear the results on tracks 14 and 15 of the enclosed DK25 DrumKit™ Demo CD.

The DK50/R Premium DrumKit™ System has been designed for recording in a studio or other acoustic space that is ideal for recording. The DK50/R has two QTC50 omni microphones for overheads and one SR30 cardioid for kick drum. For live performance applications, we recommend the DK25/L, which has three SR25 cardioid microphones. This will work better for live applications and provide more gain before feedback.

Miking the Kick Drum and using the KickPad®

A good kick drum microphone must be designed and optimized for that specific purpose. This means the microphone is great for kick drum and nothing else. Therefore we designed our kick drum optimization in an external XLR package - the KickPad®. Just plug the KickPad® into the mic line going to the SR30 kick drum mic for magnificent results. With the KickPad® removed, you can use the same SR30 microphone for recording most anything. All three high quality Earthworks microphones in the DrumKit™ System can be used for other instruments and vocals. As an added bonus, the KickPad® will improve the sound of other popular microphones used for kick drum. By listening to tracks 4 through 9 on the enclosed DK25 DrumKit™ System Demo CD, you can hear the results of the KickPad® used on our SR25 cardioid microphone and also on an AKG D112 cardioid microphone. The KickPad® will provide outstanding results on other popular kick drum microphones such as the E-V RE20, Audix D-6, Shure 57 and others. Simply plug the KickPad® into the mic line feeding the kick drum mic and you will be astonished with the sound.

Important Please Read

The Earthworks SR30 supplied for miking kick drum is a precision condenser microphone and is sensitive to large bursts of air. However, this microphone, used properly, will produce an incredible kick drum sound. For optimum results it is crucial to place the SR30 at a 45 degree angle to the head (which reduces the air burst at the front of the microphone). Whether your kick drum has a front head or not, place the SR30 at a 45 degree angle to the front of the drum as indicated in Figure 5. If there is a hole in the front head of the kick drum, do not place the mic in front of the hole as there will be a large burst of air hitting the microphone. In our field tests, we achieved the best results and the best sound by miking the drum just off of the rim as shown in Figure 5. Whatever your approach, if you get any popping from the air bursts, place the enclosed windscreen on the kick drum mic, and place the mic at a 45° angle to the drum head.

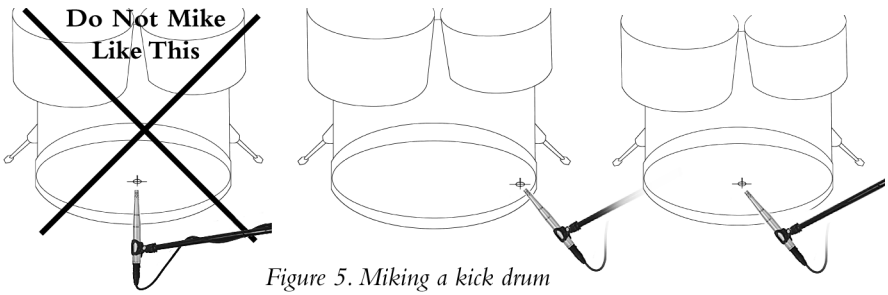

Figure 5. Miking a kick drum

We hope the suggestions in the manual have been beneficial for you. Don't be afraid to experiment with mic placement. You can be as creative with your mic placement as you are with your music. You are the judge of what works best and sounds best.

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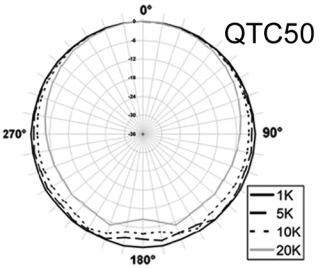
The DK50/R Premium DrumKit™ System and accessories come in a genuine Zero/Halliburton case.

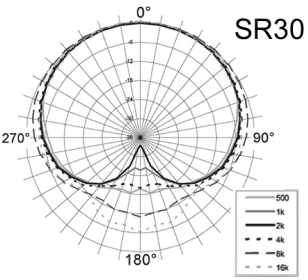
Specifications for QTC50

Frequency response	3Hz to 50kHz +1/-3dB
Polar pattern	Omnidirectional
Sensitivity	30mV/Pa (-30.5dBV/Pa)
Power requirements	48V Phantom, 10mA
Peak acoustic input	142dB SPL
Output	XLR (Pin 2+)
Min output load	600Ω between pins 2&3
Noise	22dB SPL equivalent (A weighted)
Dimensions (L x D)	229mm x 22mm (9 x .860 inches)
Weight	225g (.5lb.)



Specifications for SR30

Frequency response	30Hz to 30kHz ±1/-3 dB
Polar pattern	Cardioid
Sensitivity	10mV/Pa (-40dBV/Pa)
Power requirements	48V Phantom, 10mA
Peak acoustic input	145dB SPL
Output	XLR (Pin 2+)
Min output load	600Ω between pins 2&3
Noise	22dB SPL equivalent (A weighted)
Dimensions (L x D)	212mm x 22mm (8.4 x .860 inches)
Weight	225g (.5lb.)



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