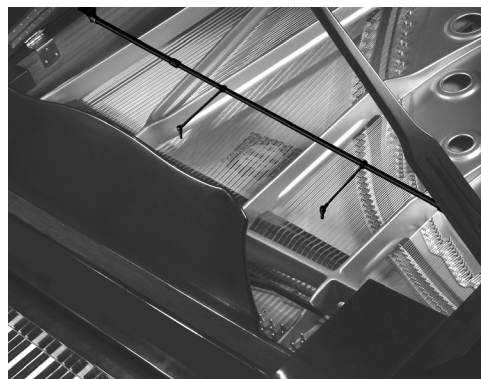


- Introducing the Ultimate Piano Microphone System That Will Change Piano Miking Forever
- 40kHz High Definition, Random Incidence Microphones for Outstanding Performance Within the Sound Field of a Piano
- Invisible from Outside the Piano
- Incredible Gain before Feedback
- Sounds Amazing with Piano Lid Up or Down
- Virtually No Leakage from Surrounding Instruments
- Quick, Simple and Easy Setup

### Architectural & Engineering Specifications

#### 40kHz Random Incidence Omni

The microphone shall contain a matched stereo pair of back-electret condenser type elements with a wide-range uniform frequency response of 9 Hz to 40 kHz. The microphone shall be calibrated for random-incidence response for a diffuse sound field operation. The microphone shall have omnidirectional polar characteristics uniform in all planes, with no more than 5dB deviation from on-axis response at any angle of incidence at 10kHz. The microphone shall have an output level of 15 mV/Pa. The microphone shall have an impulse response with the rise time no longer than 20 microseconds, and total settling time, including the rise time, no longer than 100 microseconds. The microphone shall accept sound pressure levels up to 148 dB producing no more than 3% THD. The microphone elements shall be mounted on flexible necks no shorter than 4 in. (10cm) and attached to an expandable rod with minimum length no more than 46 in. (115cm) and maximum length no less than 60 in. (150cm). The microphone shall require 48V phantom power. The microphone shall be made of metal with black finish. The Earthworks PM40 is specified.

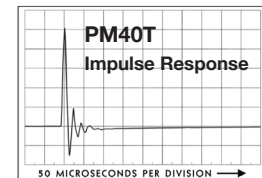
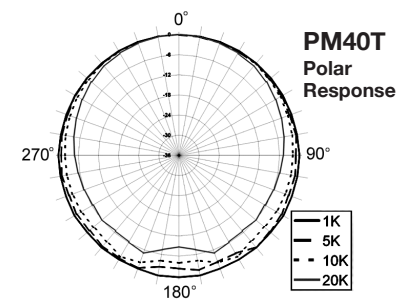


### Conventional Methods of Piano Miking

To date, the numerous methods of miking a piano have all been less than ideal. Such conventional methods include placing a microphone inside the piano on a pillow, or mounting microphones on mic booms and extending them into the piano. Other approaches involve pressure-zone microphones mounted inside the piano, various types of electromechanical pickups in addition to mounting conventional microphones inside the piano with clamps on the piano frame or suction cups stuck to the piano lid. Not only are these mounting methods less than ideal, there are far more important issues affecting the sound. Contact pickup devices or other types of electromechanical pickup methods typically sound muddy and have no real detail or transparency in the sound. When miking pianos for sound reinforcement systems, cardioid microphones are typically chosen in an effort to provide ample gain before feedback. However, the proximity effect of cardioid microphones will create an undesired low-frequency boost. When using conventional microphones there is always the problem with gain before feedback in addition to leakage from other instruments into the piano microphones.

### What Contractors and Studios Really Want

Many sound contractors have expressed the need for a better way to mike pianos in churches, performance art centers and recording studios. They have tried all the various types of microphones and microphone pickup devices for pianos. No matter what they have tried, they either didn't like the quality of sound they were getting or didn't like the mounting system or mi-



crophone stands in front of the piano. When using conventional microphones they couldn't get enough sound level before feedback, and they were getting leakage of other instruments into the piano microphones. Engineers in recording studios have always found it nearly impossible to simultaneously record an acoustic piano with other instruments in the same room.

### The New Earthworks Approach

When we showed a prototype of the Earthworks PM40T PianoMic™ System to churches and recording studios they were amazed. Churches were able to get a piano sound that was far better than ever before, with an incredible amount of gain before feedback. The microphones were not visible outside the piano and there was virtually no leakage of other instruments into the piano microphones. Recording

### Specifications

<b>Frequency Response:</b>	9Hz - 40kHz
<b>Polar Pattern:</b>	Omnidirectional (random incidence)
<b>Sensitivity:</b>	15mV/Pa (-36 dBV/Pa)
<b>Power requirements:</b>	48V Phantom, 10mA
<b>Peak Acoustic Output:</b>	148 dB SPL
<b>Output:</b>	XLR-3 (pin 2+)
<b>Min. Output Load:</b>	600 ohms between pins 2 & 3
<b>Noise:</b>	22dBA
<b>Mic Gooseneck Length:</b>	4.875" (12cm)
<b>Dimensions:</b>	64" (160cm) fully extended 46" (115cm) fully collapsed
<b>Product Weight:</b>	8.8 lbs. (4kg) pdct. in case
<b>Shipping Dimensions:</b>	49x10x8 in. (1245x254x203mm)
<b>Shipping Weight:</b>	13 lbs. (5.9kg)

# The Ultimate Piano Microphone System That Will Change Piano Miking Forever

studio engineers were also astounded – they could now record acoustic piano in the same room simultaneously with other instruments. They all said that the PianoMic™ System was incredible, hands down! For pianos in churches, performing arts centers or recording studios, you will be amazed when you see and hear the new Earthworks High Definition PianoMic™ System in action.

## Random Incidence High Definition Microphones™

The heart of the PianoMic System is two omnidirectional 40kHz High Definition Microphones™ with a frequency response from 9Hz to 40kHz, incredible impulse response and very short diaphragm settling time. The 40kHz High Definition Microphones have been designed for random incidence pickup. When microphones are placed inside a piano they are within a sound field that has multiple sound sources: i.e. every string, the sound board, multiple reflections of the sound from the sound board, the sides and the

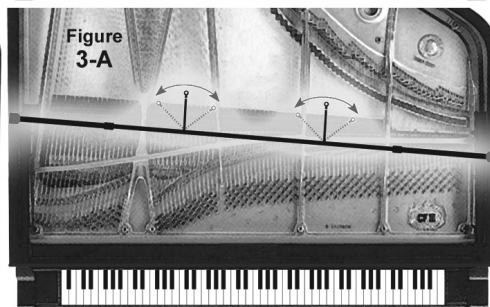
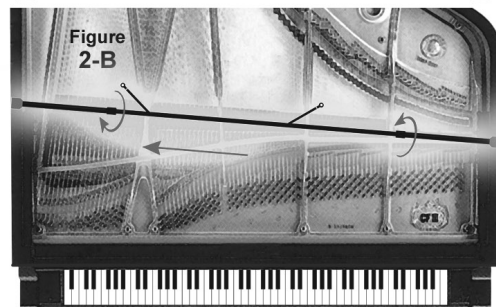
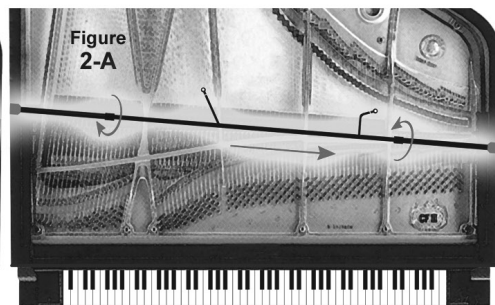
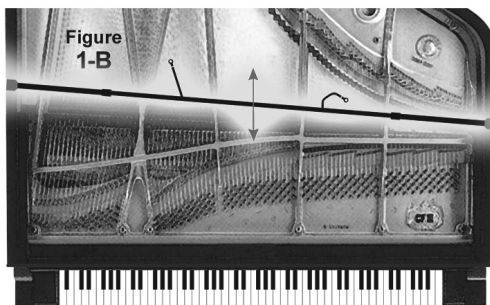
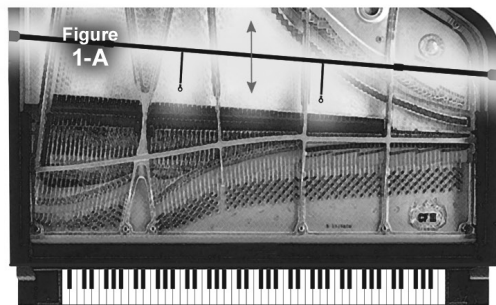
a church sound reinforcement system, we were able to make a piano sound louder than a loud pipe organ, and there was a great deal more gain available before reaching feedback. These tests also showed that feeding the piano sound into choir monitor speakers would produce far more sound level than the choir members could stand without being anywhere near a level that would cause acoustic feedback.

## Virtually No Leakage of Sounds from Outside the Piano

One might ask, "How can you use omni microphones and have essentially no leakage of sounds from outside the piano?" There are two important elements in the answer: (1) the microphones are placed inside the piano shell and are somewhat isolated from sounds outside the piano; (2) microphones are placed 3 to 6 inches above the piano strings, making the sound level of the piano picked up by the microphones phenomenally louder than sounds coming from outside

The telescoping tube spans across the piano over the strings and can be moved so the two microphones can be placed close to the hammers (see Figure 1-A) or further away from the hammers (see Figure 1-B). The telescoping tube can be placed on the piano with the microphones facing the keyboard or with the microphones facing away from the keyboard (as illustrated in Figures 1-A and 1-B). This flexibility allows a wide range of microphone placement options using the PianoMic™ System. As various makes and models of pianos differ in their size and construction, the highly adaptable PianoMic™ System will provide you with optimum results on any grand piano. The center section of the tube can be moved as much as eight inches to the left or the right if you desire to favor either the low or high strings of the piano (see Figures 2-A and 2-B). In addition, the flex arms allow the microphone heads to move approximately four inches to the left or right (see Figure 3-A) as well as up or down (closer or further from the strings, see Figure 3-B). This illustrates the versatility of the PianoMic™ System and the ease with which it can be adjusted.

The innovative PianoMic™ System incorporates all of the Earthworks High Definition Microphone™ proprietary technologies and some new ones. The PianoMic™ System provides extended frequency response



lid of the piano. All these sound sources and reflections produce sound waves that arrive at the microphones from all directions. This is called a diffused sound field, and the PianoMic System™ High Definition Random Incidence Microphones are designed to perform optimally within such diffused sound field. In addition, these omni microphones have no proximity effect and the sound will remain the same (no increase or decrease in low frequency levels) no matter how close or how far the microphones are from the piano strings or sound board. When these technologies are combined, you can enjoy exceptional sound quality with the piano lid either up or down.

## Incredible Gain Before Feedback

The large amount of gain before feedback is achieved because the microphones are placed very close to the sound source and are within the sound field of the piano. When we first tested the PianoMic System in

the piano. Therefore any outside leakage picked up in the piano mics is dramatically lower in level than the sound of the piano itself.

## Quick, Simple and Easy to Set Up

The PianoMic™ System works differently from any other microphone approach used on piano in that it uses an adjustable telescoping tube that is supported by the sides of the piano case. The telescoping tube can be adjusted to any length from 46 to 64 inches to easily accommodate any type of grand piano. The support arms that sit on the side of the piano case are smooth with a protective coating that will not harm the finish of the piano. They are less than 1/8 inch thick, so the piano lid can be easily closed on top of them with absolutely no danger of stressing the piano lid hinge.

from 9 Hz to 40kHz, incredible impulse response, very short diaphragm settling time, near perfect polar response, is time coherent, has high SPL handling, low distortion electronics and is optimized for random incidence pickup. The PianoMic System is a dream come true for live sound and recording applications. Call us and request a demonstration so you can hear this incredible new piano microphone system for yourself. You will be impressed!



Expertly Hand Made in the U.S.A.

Earthworks, Inc. • 37 Wilton Rd. • Milford, NH 03055  
Phone: (603) 654-2433, ext 114 • Fax: (603) 654-6107  
sales@earthworksaudio.com • earthworksaudio.com

