



DPA 
MICROPHONES

Miking a Grand Piano
with DPA Microphones



Miking a Grand Piano with DPA Microphones

There are many ways to record a grand piano or amplify it live, depending on music style, sonic taste and the setting. In the following, we will describe a number of useful ways to record and amplify a grand piano using DPA microphones. As every piano, room and player is different, all setups should be regarded as guidelines. There are no strict rules and there is no better substitute for using your ears to adjust the sound to your liking.

In our setups, we operate with seven different microphone kits from DPA. Each kit is described with various microphone placement proposals. We hope this piano primer starts you in an open-minded direction to discover new and even better techniques. Every time you approach a piano, finding these placement points is like a mystery waiting to be solved.

Try this at home or in the studio

There are many choices to be aware of when placing microphones for recording the piano in a recording studio or studio type environment. Please remember that the difference between a good recording and a great recording depends on the choice of microphones and placement technique. Achieving the right sound balance may be just a question of moving the microphones a couple of centimeters in distance and degrees of angle.

In general, using a cardioid microphone will be tight and focused with a clear sound image. Using omni microphones will provide a more open, larger, and more three-dimensional sound image. If the recording space has desirable acoustics, the omnis will bring more of the room tone into the recording. If the acoustics are less than great or more separation between sound sources is needed, a cardioid will probably be a better choice.

Locating balance points

There are balance points on the inside and near the piano that should be noted. One sonic balance decision you must make will be the desired “hammer to wood” ratio. Start with the mics over the hammers and pull them back into the wood to discover the balance point that pleases you. If the piano is part of an ensemble, miking a little closer towards the hammers will usually help it sit in the mix nicely, without extensive high frequency equalization to help it punch through for solos. If you are recording a solo performance, a more woody sound will probably be more appropriate, but it is your choice.



Fig. A, Spaced pair of omni condenser mics

To discover these balance points, DPA microphones can be placed anywhere you might imagine. You can place the mics outside the piano, using a spaced pair of omni condenser mics 1 – 25 m (3 – 8 ft) from the raised lid (long stick) of the piano, on the DPA stereo boom parallel to the lid, (DPA 3503 or 3506). This technique takes the lid out of the recording while leaving it in for the pianist to monitor acoustics (Fig. A).

This setup also works well with cardioid microphones. Choose the 3511 kit, (4011-TLs) or the Compact 3521 kit (4021s) in either an ORTF configuration (Fig. B & C) or in a XY configuration (Fig. D). Using a mic stand with wheels and a competent assistant, makes it easy to continuously move the pair around until the desired sound is found. Additionally, these cardioid microphones can also be placed under the lid to find a pleasing sound. You can read more about “Stereo Techniques” at the Microphone University at www.dpamicrophones.com.



Fig. B, 4011-TL Stereo Kit in ORTF configuration



Fig. C, 4021 Compact Stereo Kit in ORTF configuration



Fig. D, 4021 Compact Stereo Kit in XY configuration

Cardioids and omnis combined

One of the principal assets of DPA microphones is their incredibly smooth off-axis response and uniform phase characteristics. This is true for both our omni and cardioid mics. For this reason, they can be used in combination without problem. Because of this off-axis smoothness, you can employ techniques that you could never attempt with most other microphones. Explore the far end of the piano away from the hammers with the lid up. Some pianos sound great down there, others do not, you won't know until you try. Combining omnis and cardioids that are under, over, and outside the piano can also produce pleasing sounds—capturing that illusive sustain as well as dynamic range along with fundamental and harmonic sounds.

In practice, you can achieve any desired sound balance blending these two components; the close, distinct and percussive hammer sound from the cardioids and the softer and bigger room tone from the omnis.

Another miking technique that many pianists are fond of using is two omnis pointed directly at each other, and up about 1.2 m (4 ft) above the piano keys (Fig. E). With one mic over the high "C" note and the other mic over the low "A" note, you will record almost the same sound as the pianist hears. Experiment with how high up the mic placement needs to be. The visual alignment is critical for greatest clarity. The diaphragms should point directly at each other. Usually you have the exact feeling of the pianist in the headphones including the sound of the fingernails on the ivory keys.



Fig. E, Recording with 4006-TL Stereo Kit



Fig. F, DD0297 Diffuse-field Grid



Fig. G, Close-miking Grid

Acoustic Modification Accessories

Listen to the different grids on the 4003/4006-TL omnis in any of your placement attempts. The high frequency equalization boost from the black grid (Fig. F) is acoustic and very pleasing on some pianos, and again it might help in pushing the piano out of a busy or cluttered mix. On the other hand, using the trapezoid close-miking grid (Fig G) rolls off the high frequencies smoothly and provides a rounder tone with softer attacks.



Fig. H, UA0777 Nose Cone

The nose cone and the Acoustic Pressure Equalizers (APEs) should also be considered. With these, you are able to modify the frequency response and directional characteristics acoustically, which are great miking tools, giving your recordings a more intense sensation of source clarity and pre-sense and a marked increase in brightness. Using the nose cone (Fig. H) will change the sound quality of the microphone to have an attack impact without excessive volume sound. Try this for jazz, pop, and rock and roll piano to give you that more percussive sound. You can read more about "Acoustic Modification Accessories" at the Microphone University at www.dpamicrophones.com.

Large Diaphragm Tube microphones

The 4041 large diaphragm microphone has an upper-midrange, 5 dB on-axis lift. With this presence boost attribute, you can use this microphone as a kind of “pointing equalizer”, to achieve the desired frequency change in the direction you actually need it. This means that it is possible to obtain a perfect balance between a neutral reproduced ambient room tone and a distinct keystroke sound with a nice present percussive attack, since only the on-axis response has the upper-midrange lift.

Place the 4041 pair over or just ahead of the curve of the piano in an oversized ORTF configuration: 40 cm (16 in) spacing, 70° angle between the capsules and point the microphones at the hammers.

For recordings in large environments with desirable acoustics, for instance churches or concert halls, a main pair with 4041 microphones at 2 – 3 m (6 – 10 ft) and elevated 3 – 4 m (10 – 13 ft) will outline the clarity of that piano in those exact surroundings. The sensation of brightness will be more prominent than with the linear response of the 4003s/4006s. Again, it is a matter of taste. The instrument and recording space will provide the answer.

Try this on stage

For amplifying a piano live, the main consideration is mostly how much gain before feedback you can achieve in the specific acoustical environment. How you mike will depend on this more than the actual preferential sound quality. The answer is either to place the omnis in the piano—with magnets at the piano frame—for one kind of sound or cardioids for even more spill rejection. On a “live” stage there is the risk of bumping into a microphone stand or the piano may be moved several times making it difficult to keep the mic placement consistent. For these reasons, we often choose to secure the DPA compact omni or compact cardioid microphone to the piano frame using the MB4000 Magnet Base with a GM4000 or GM4050 Gooseneck Mount.

If using omnis (3503, 3506, or 3552), we recommend trying the UA0777 Nose Cone. This setup will smooth out the pattern to an almost perfect omni allowing you to place the mics directly on top of the hammers without overdoing the notes directly under the mic. Usually this placement is not where the pianist accompanies in the piano mid octaves, but above and below the accompaniment octave to a spot that features high note solos and bass note accents. This technique does not sound particularly good for recording but can produce excellent results on a “live” stage.

Fig. 1, 4052 Compact Stereo Kit



Miking a piano with miniature microphones

With the SMK4061 Stereo Microphone Kit a number of useful piano setups can be achieved: This is a low cost stereo kit, equally suited for project studios and for hidden mic setup on stage, using two high quality 4061 omnidirectional miniature microphones and a variety of mounting accessories for placement in and on the piano, with either open or closed lid.

Try placing 4061 miniature microphones with the DMM0011-B magnet holder in and around the sound holes of the piano (Fig. J). You can use two or three 4061's and create a balanced multidimensional sound with good front of house and monitor volume along with recordability. Try placing one mic over the high mid strings and one over the mid low strings. This method will give you high gain before feedback because of the close distance to the frame. It will provide a very rich and dynamic sound quality.

Boundary Layer Mounts (BLM6000-B) are also included in the SMK4061 kit. Mount two BLM6000's inside the open piano lid to get a natural sound for recording (Fig. K). The pressure zone technique will "draw in" and accumulate the piano's timbre nicely and at the same time be very discreet. Placing them directly on the soundboard under the strings gives a sharp pop sound for on-stage use with a penetrating "honky-tonk" sound color.

With the DMM0007 Universal Surface Mounts you can fix the mics directly on the inside of the piano lid. This is also an almost invisible mounting technique. The microphone element is able to hang from its own integrated cable with the double-sided tape pads and the height/acoustic balance can be easily adjusted. A well balanced, open-sounded position is 30 - 40 cm (12 - 16 in) over and in front of the hammers with approx. 60 cm (24 in) spacing (Fig. L).



Fig. J. 4061's mounted with magnet holders in piano



Fig. L. 4061's hanging in surface mounts fixed on piano lid

**Fig. K, 4061 in boundary layer mount
on piano lid**



Seven solutions to choose from:

3532 (4041 Large Diaphragm Stereo Kit, 130 V)

Available as either 4041-S Solid State, 4041-Tube, or 4041-SP Solid State Phantom Power. A high end Stereo Kit consisting of a matched pair of 4041-T2 omnidirectional Large Diaphragm Tube microphones. The HMA5000 Microphone Amplifier and Power Supply plus the specially designed DPA Stereo Boom make this kit a highly desired professional solution, adding a bit of musical tube coloration to the recording.

3506 (4006-TL Stereo Kit)

The DPA 4006-TL is a worldwide reference thanks to its precise, detailed, and natural reproduction. The 3506 is likewise a product for sound engineers with demands for high quality. The total transparency and natural-sounding clarity of this microphone pair will provide you with a lifetime of satisfying listening. The feeling of being there is intense and impressive every time.

3503 (4003 Stereo Kit, 130 V)

This is the ultimate recording kit for faithful reproduction, using two high-voltage omnidirectional microphones. Includes a preamp and power supply. This is an excellent choice for classical recordings and bigger and more open sounding pianos in general.

3511 (4011-TL Cardioid Stereo Kit)

With a pair of 4011-TL microphones with smooth off-axis response, this solution is recommended for stereo recording using close-miking techniques. Several standard setups such as ORTF or XY are also possible. The mics handle high SPL and will allow close placement as well as more distant placement with a focus on the proximity effect. This solution is recommended for jazz or pop recordings with mic placement closer to the hammers.

3552 (4052 Compact Stereo Kit)

The compact omni kit is a low-profile solution that mounts on the piano frame and can be used for closed and open lid techniques both in the studio and on stage. The compact kit offers the best of both worlds: genius mounting solutions and sonic excellence.

3521 (4021 Compact Stereo Kit)

The compact cardioid kit is a low profile solution that mounts on the piano frame allowing individual placement as well as a special mount for ORTF and XY stereo setups. This kit is recommended for recordings with a mic placement closer to the hammers or as permanent ORTF stereo setup with the dedicated holder. The compact kit offers the best of both worlds: genius mounting solutions and sonic excellence.

SMK4061 Stereo Microphone Kit

High quality 4061 omnidirectional miniature microphones and a variety of mounting accessories for placement in and on the piano, with open or closed lid. This is a low cost solution for project studios and hidden mic setup on stage.



DPA



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