



THE CORTADO MKIII

CONTACT MICROPHONE

Owner's Guide

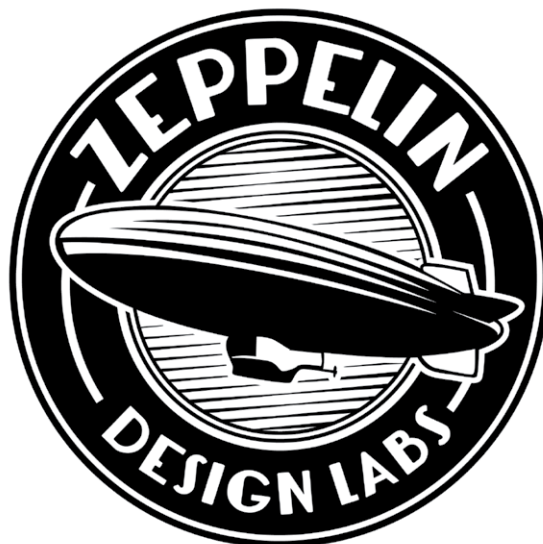


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THE CORTADO MKIII

Discover the hidden sounds in the world around you!

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|----------------------------------|----|
| INTRODUCTION | 3 |
| USING THE CORTADO | 4 |
| DIP SWITCH SETTINGS | 4 |
| SENSOR PLACEMENT | 5 |
| SENSOR MOUNTING | 6 |
| ISOLATING THE SENSOR CABLE | 8 |
| MICROPHONE CARE | 8 |
| TECHNICAL SPECIFICATIONS | 10 |
| DISCLAIMER | 11 |
| WARRANTY | 11 |



INTRODUCTION

The Cortado MkIII is a high quality contact microphone featuring a robust, sensitive transducer designed for use in professional applications. The Cortado is now in its third generation, benefiting from improvements in nearly every area of design. The internal class-A pre-amplifier is fully balanced with a low impedance output, which allows for wide bandwidth, low signal losses, and high signal to noise ratio. The transducer is connected to the pre-amp chassis via a high quality 6 foot long shielded cable. User-controlled features such as a -10dB pad and "bass boost" (high pass filter) make the Mark III extremely versatile in any application.

Practically everything around you is vibrating or resonating. The Cortado contact mic can capture those vibrations that lie within the audible frequency range with excellent results. In the recording studio or on stage, the Cortado can be used on pianos, percussion, guitars or other stringed instruments. It can be used as a plate reverb pickup, or under a tap dance floor. Cortado has been used extensively in live sporting venues to capture sounds for television broadcast. It is perfect for applications in sound design studios, dance stages, and theaters. It can be used in the loudest sound reinforcement environments without any chance of feedback. The Cortado is an essential addition to any sound designer or audio engineer's tool box.

The Cortado is able to capture sounds that traditional air pressure microphones can't detect. You've heard the sound that's in the air; now discover the hidden sounds in the solid world around you!



USING THE CORTADO

To use the Cortado MkIII, plug a standard XLR cable into the jack on the preamp chassis. Attach or hold the sensor head to the surface of the sound source you want to capture. Phantom power is needed in order for the Cortado to operate. Voltage as low as 24V can be used to power the microphone, but for full dynamic range 48V is required.

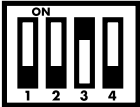
DIP SWITCH SETTINGS

The DIP switch on the bottom of the Cortado chassis controls the “pad” and “bass boost” functions.

DIP switches 3 and 4 control the pad. To engage the pad, set switch 3 to the “OFF” position and switch 4 to the “ON” position. The pad lowers the signal coming out of the XLR jack by about 10dB. This may be useful for very loud signal sources which would have a tendency to overdrive your mixer or recorder’s input.

Conversely, set switch 3 to the “ON” position and switch 4 to the “OFF” position to leave the audio signal unattenuated.

“Bass boost” is what we call the high pass input filter on the Cortado MkIII. Set switches 1 and 2 to the “OFF” position to turn bass boost off; in this position the high pass filter of the internal preamp is set to around 150Hz. To engage bass boost, set switches 1 and 2 to the “ON” position; in this position the high pass filter is now set to 23Hz. (Note the frequency response graph on page 9.)

| | |
|---|-----------------------------------|
|  | BASS BOOST ON PAD OFF |
|  | BASS BOOST ON PAD ON |
|  | BASS BOOST OFF PAD OFF |
|  | BASS BOOST OFF PAD ON |

Depending on how you are using the Cortado MkIII, controlling how much “low end” you pick up is oftentimes very important for preventing the audio from sounding muddled. We have found that when the Cortado is being used with other microphones or in a mix of other audio sources, when the bass boost is OFF the sounds picked up by the Cortado are often much clearer and more distinct in the mix.

Turning the bass boost ON is useful when you want to hear a wider bandwidth. This is ideal for many “found sounds” and most acoustic instruments. There are no rules; trust your ears and let them be your guide.

Unlike microphones that capture air pressure differences (traditional dynamic, condenser, and ribbon microphones), a wide bandwidth in contact microphones is not always necessary or even desirable. Often it is important to limit the bandwidth of contact microphones to a more narrow portion of the audio spectrum to avoid picking up all kinds of unexpected vibrations. This is because solid objects transfer sound much more efficiently than a spongy medium like air. You’ll find that most solid objects easily pick up sound vibrations from the air as well as any other oscillations in their environment. You could say that in the world of solid mass, there is a lot more noise pollution. So you may consider using the Cortado with the bass boost off for most applications. Depending on your application, you may even need to add an additional high pass filter!

SENSOR PLACEMENT

What you hear with a contact microphone will depend strongly on the sensor’s location on an object’s surface. You must be prepared to experiment with sensor placement. Small changes in placement can mean big changes in bandwidth and frequency response.

When choosing where to place the sensor on a solid object keep in mind that the more dense a substance is, the easier vibrations will pass through it. It is possible to “tune” the frequencies that the sensor picks up by placing a dampening material between the sensor and the vibrating surface. For example, using one layer of thin cloth as a dampening material would allow the lower frequencies (with more energy) to pass through to the sensor, while absorbing the higher frequencies (because they don’t have enough energy to get through the cloth). When placing the sensor on soft, or less dense objects, the opposite is true: it may be helpful to attach a more dense object to the soft material, and then attach the sensor to the dense object. But as with everything else, please experiment—that’s where using the Cortado really starts to get fun!

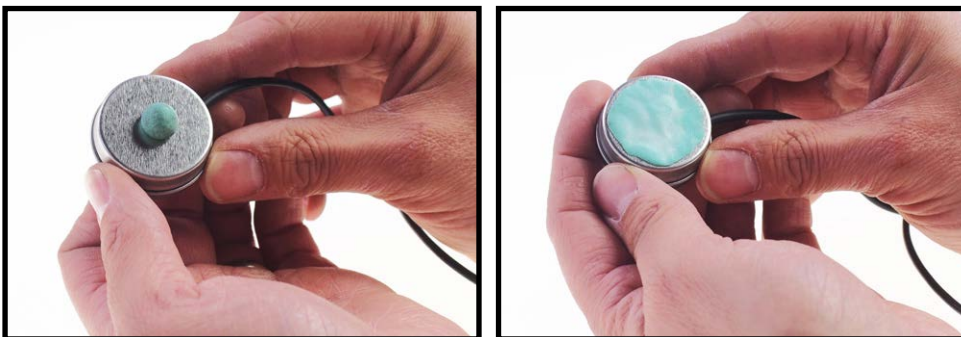
SENSOR MOUNTING

With contact microphones the concept of coupling is very important. Nothing affects the bandwidth and frequency response of contact microphones more than how well the sensor is attached to the vibrating surface.

There are many ways to mount the sensor to a vibrating surface. We have found a few very practical mounting methods which cover a wide variety of applications. For temporary mounting we suggest using sensor putty (supplied with the microphone) or a spring clamp. For permanent installation of the sensor we suggest using a mounting strap or thin (non-foam) double sided tape. All of these devices are available from Zeppelin Design Labs in a separate accessory kit.



The putty is good for mounting the sensor on both smooth and rough surfaces. It can conform to uneven surfaces, providing better coupling between the sensor and the vibrating surface. To apply the sensor putty, roll it into a ball and place it on the bottom of the sensor head. Gently flatten the ball out on the bottom surface of the sensor. Try to keep the putty as thin and flat as possible to ensure that air bubbles aren't trapped between the putty and the sensing surface. The bottom of the sensor doesn't have to be completely covered with the putty; enough of the surface just needs to be covered to ensure good coupling.



To preserve the useful life of the sensor putty, clean all dirty surfaces before application.

NOTE: Sensor putty is only intended to be used as a temporary mounting mechanism. Do not leave the sensor putty attached to delicate surfaces (such as oil or lacquer finishes) for more than a few hours at a time. The sensor putty should not be used on surfaces with loose or weak finishes, or they are likely to be damaged when removing the sensor. Please see the warning about the sensor's lid on page 8.

Spring clamps are great for mounting the sensor near the edge of thin objects. Spring clamps can couple the sensor tightly to a surface, which really helps to capture the full bandwidth of the vibrations.



Mounting straps for the Cortado MkIII sensor (included in the optional accessory kit) are perfect for permanently mounting the sensor to a wooden surface, such as the underside of a basketball court or tap dance floor. When using a mounting strap make sure to place the sensor in the very middle of the bracket, so that neither side of the strap touches the side of the sensor head. Use the supplied screws to attach the strap to the vibrating surface.



Double sided tape is a great option for permanently mounting the sensor to smooth surfaces. For capturing the fullest bandwidth, use thin double sided tape with very strong adhesive properties, such as the tape disc provided in the mounting accessory kit. Foam-type tapes will behave as a mechanical filter, tuning out certain frequencies. Sometimes, this may be just what you need for capturing a particular sound. Feel free to experiment.

ISOLATING THE SENSOR CABLE

Because the sensor head vibrates, a portion of those vibrations will be transferred to the cable. Therefore it is important to consider how the cable is placed with regards to the sensor. If the cable is stretched tight, it will impede certain vibrations within the sensor, acting as a mechanical filter. The opposite is also true: if the cable is left dangling in the wind, the cable's movement will be picked up by the sensor (usually as a low rumbling). So when you are mounting the sensor be mindful of how the cable will vibrate and also how it could dampen the sensor from vibrating. We have found that it often helps to clip or tape the excess cable to a non-vibrating surface, decoupled with a soft rag or a piece of foam rubber. Once again, experiment with what works best for your application.

MICROPHONE CARE

The Cortado MkIII preamp chassis, cable, and sensor head can be cleaned with any mild, non-corrosive cleaning agent and a soft cloth. Do not apply liquids directly to the pre-amp chassis. In field applications, treat the pre-amp with the same care you afford your recorder.

The Cortado MkIII is shipped with optional adhesive rubber feet to attach to the bottom of the chassis. These feet will help keep the chassis from sliding around on smooth surfaces.



There are no user-adjustable or serviceable components inside the pre-amp chassis, but there are some components vulnerable to damage. Opening the pre-amp chassis will void your warranty.

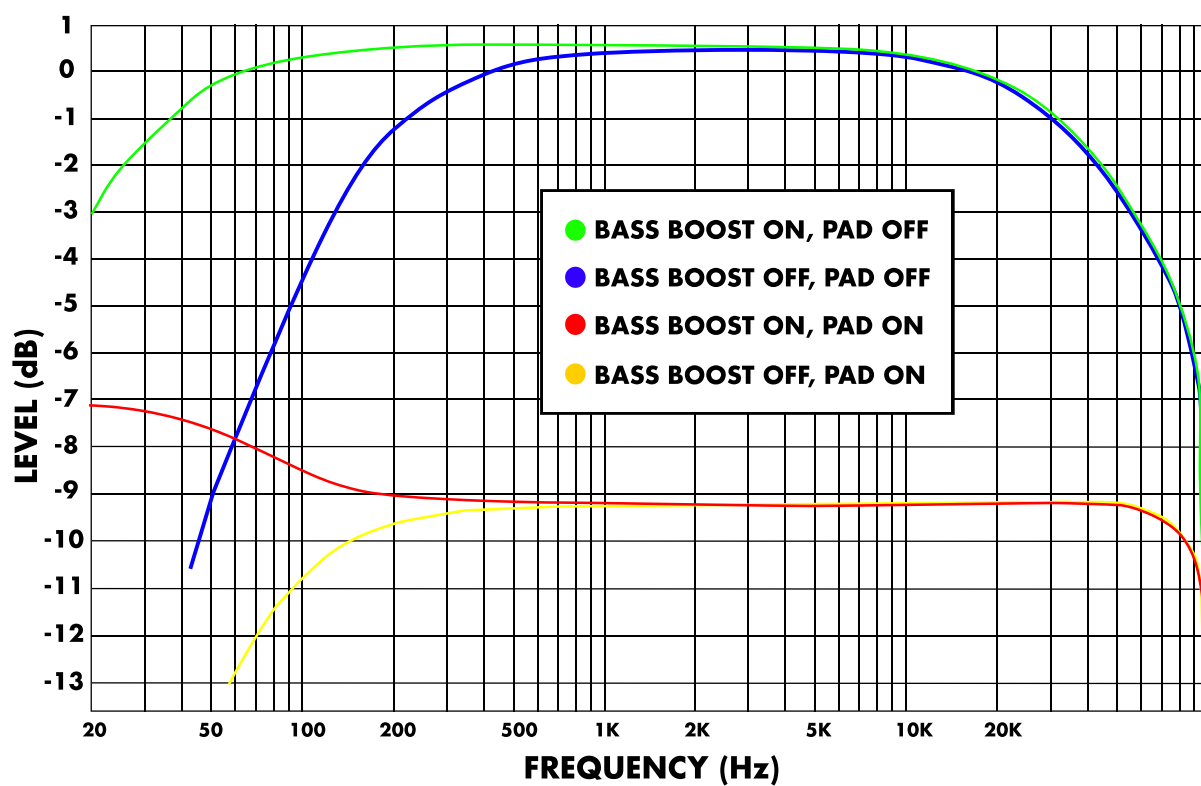
NOTE WHEN HANDLING THE SENSOR HEAD: When sensor putty or double sided tape has been used to mount the sensor, to remove it, grip the sensor can by its base, NOT its cap, and gently lift up on one side. DO NOT grip the lip of the sensor can when lifting it; otherwise you may eventually rip the lid off the can. Sensors damaged in this way are not covered by our warranty, but it is easy to glue the lid back on with some industrial strength glue (such as E6000, Amazing Goop Plumber's Glue , epoxy, or even construction adhesive).



The sensor head is able to be used underwater, but the pre-amp chassis is not. Please do not let water (or any other liquid) get into the chassis. Keep the pre-amp chassis away from excessively dusty or dirty environments. We suggest you keep your Cortado in its box when it is not in use. When you are putting the microphone away, wrap up the sensor cable gently. Be mindful to not apply too much stress near the cable's ends. With proper care and handling, the Cortado MkIII should give you years of great service.

TECHNICAL SPECS

| | |
|----------------------------|--|
| Transducer type | PZT |
| Frequency response | Bass boost on 23Hz-40kHz, bass boost off 150Hz-40kHz |
| Output impedance (at 1kHz) | ~4.4k ohms |
| Built-in preamp gain | ~150 (without pad), ~50 (with pad) |
| Circuitry topology | Class-A preamp |
| Operating temperature | -40 to 80 degrees C |
| Operating Phantom voltage | 24V - 48V |
| Phantom power current | ~1.3mA |
| Sensor cable length | 6 ft. (1.8m) |



DISCLAIMER

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All information and technical details in this manual is based on data that was available at the time of publication. Zeppelin Design Labs reserves the right to amend product specifications and information without notice.

WARRANTY

Zeppelin Design Labs products are covered by a 90 day limited manufacturer's warranty from the date of purchase. This warranty covers all manufacturer's defects. More details are available at www.zeppelindesignlabs.com.

Zeppelin Design Labs offers and stands by a warranty based on "common sense." Misuse and abuse of our products (as deemed by Zeppelin Design Labs) is not covered by this warranty. Zeppelin Design Labs is also committed to a policy of honesty and integrity in dealing with customers and warranty claims.

