stadium

USBPRO
User Manual

Cardioid Condenser USB Microphone

Contents

Preliminary setup with Mac OS X

1. Plug the free end of the provided USB cable into the USB port on your computer.
Your computer will automatically recognize the USB device and install a driver.

2. To select the USBPRO as your audio input, first, open your **System Preferences.**
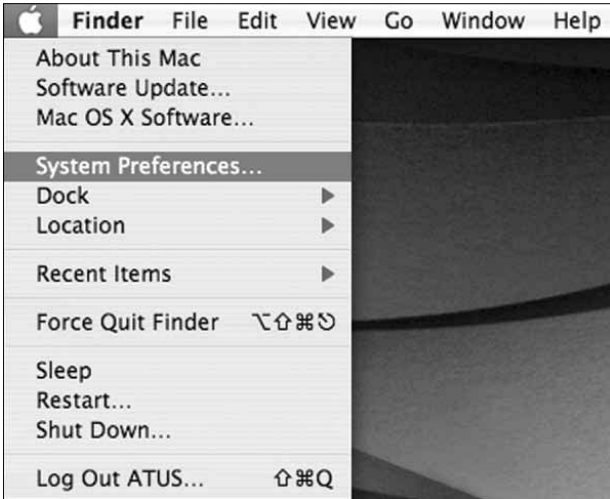
Note: Many recording software programs are available online. Audacity is widely used free software for recording and editing sounds. It is available online at http://audacity.sourceforge.net/

3. Next, click Sound to display the Sound preference pane.

4. Click the Input tab and select the USBPRO as the device for sound input.
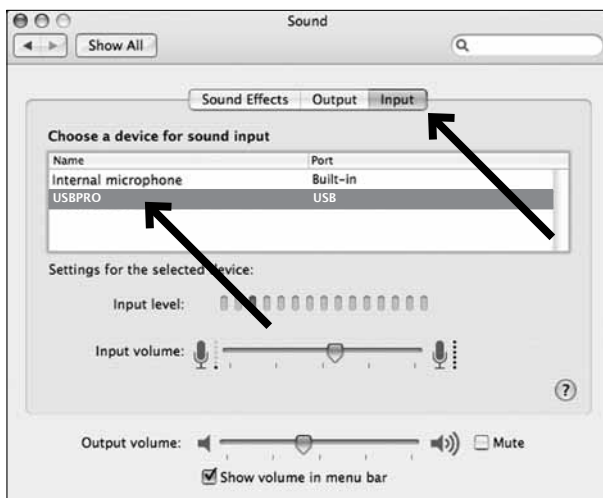
Your preferences are now set to use the USBPRO on your Mac with GarageBand or another recording program of your choice.

Preliminary setup with Windows XP

(Service Pack 2; other operating systems may vary slightly)

1. Plug the free end of the USB cable into the USB port on your computer.
    Your computer will automatically recognize the USB device and install a driver.

2. In the lower right portion of your   screen you may see a message that new hardware was found;
    or you may see a driver software installation notice.

3. To select the USBPRO as your default recording device, begin at your **Start** menu.
    Select Control Panel .

4. Select **Sounds and Audio Devices** .
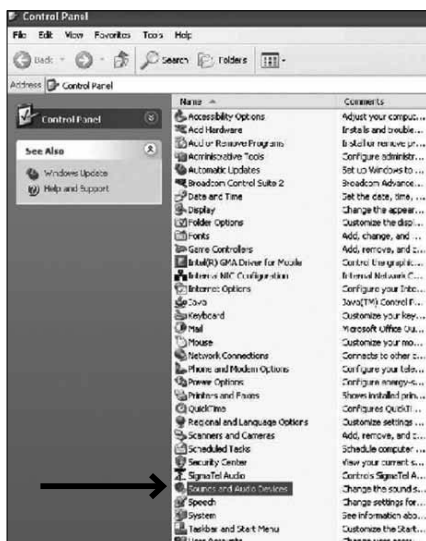
5. Select the **Audio** tab, and choose **USBPRO** as the default device.

6. Adjust computer volume by clicking on the **Volume** button beneath Sound recording Default device.

7. Through the **Wave In** window, you can set the computer volume or mute the microphone.

Your preferences are now set to use the USBPRO with Windows XP with the recording program of your choice.

Preliminary setup with Windows Vista

1. Plug the free end of the USB cable into the USB port on your computer.
Your computer will automatically recognize the USB device and install a driver.

2. In the lower right portion of your screen you may see a message that new hardware was found; or you may see a driver software installation notice.

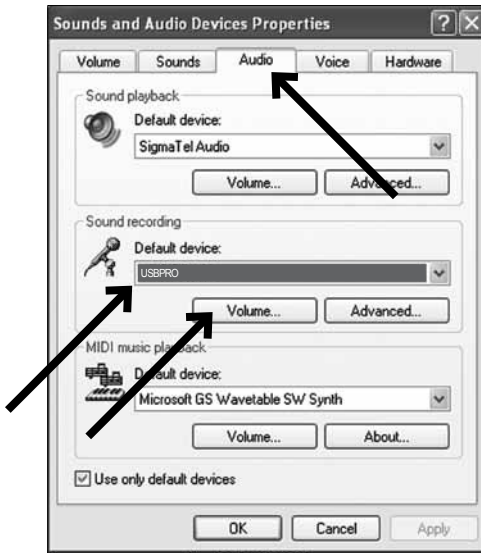**3.** To select the USBPRO as your default recording device, begin at your **Start** menu. Select **Control Panel**.
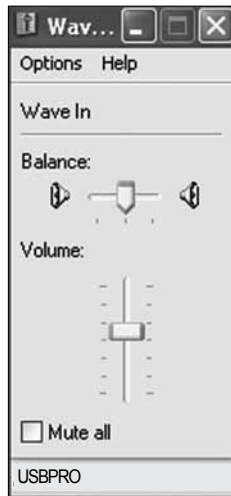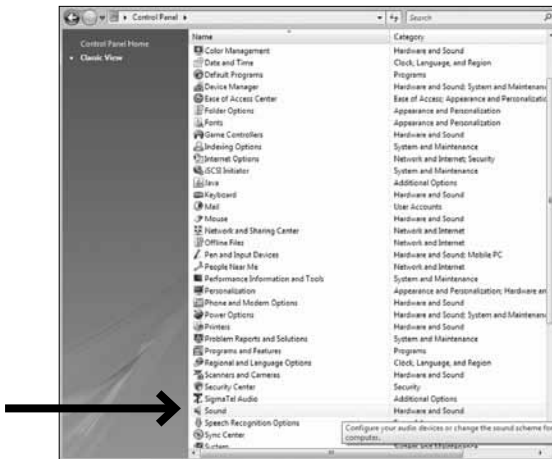
4. Select (double-click) **Sound**.

5. Select the **Recording** tab. Make sure that the **USBPRO** microphone is set as the default recording device. (You should see a green check mark beside the USB microphone icon.)
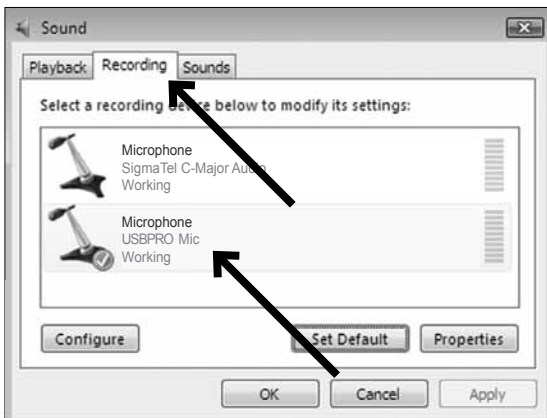

Your preferences are now set to use the USBPRO with Windows Vista with the recording program of your choice.

Preliminary setup with Windows 7/10

1. Plug the free end of the USB cable into the USB port on your computer.
Your computer will automatically recognize the USB device and install a driver.

2. In the lower right portion of your screen you may get a message that new hardware was found; or you may see a driver software installation notice.

3. **Start menu > Control Panel > Sound**
To select the USBPRO as your default recording device, begin at your Start menu.
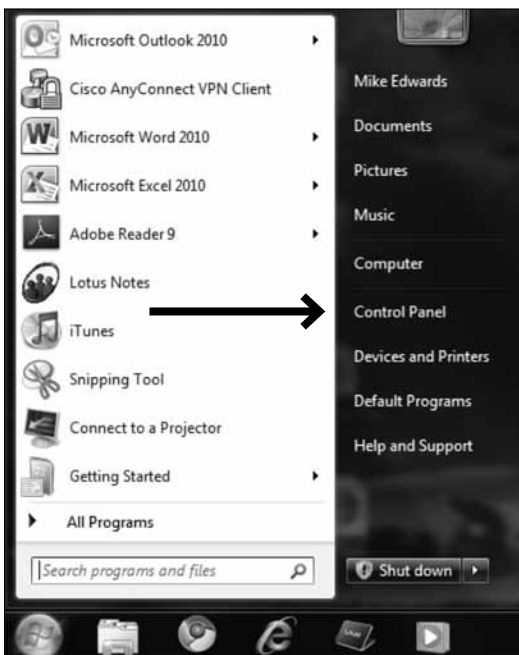Select **Control Panel** .

Preliminary setup with Windows 7/10 (continued)

4. Select **Sound** .
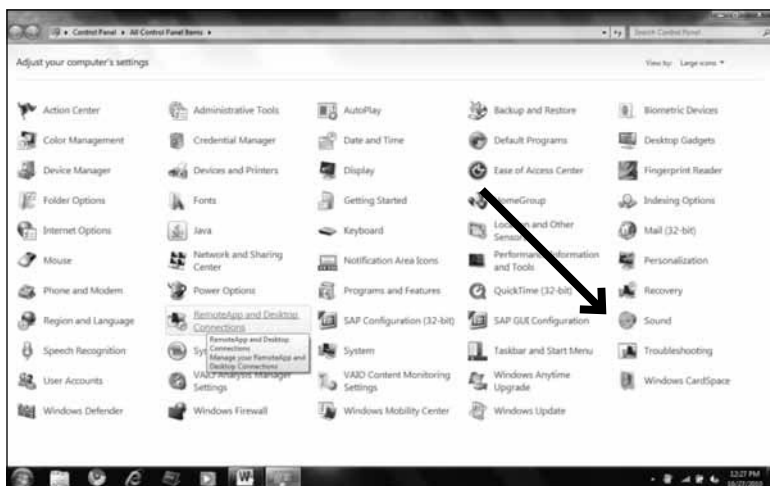
5. The following screen will pop up:

6. Select the **Recording** tab, and choose **USBPRO** as the default device.
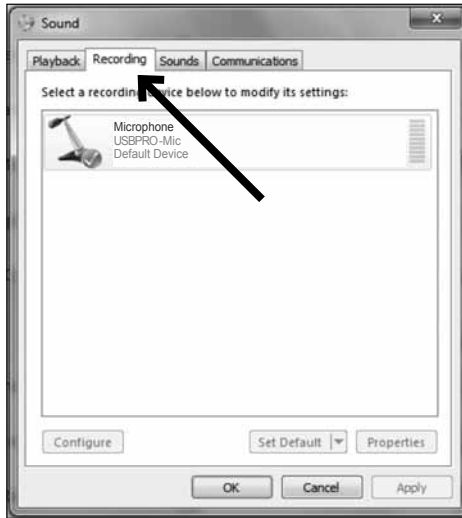
7. Double click on the USBPRO icon to open the **Microphone Properties** window. Select the levels tab to adjust microphone level (loudness). You may need to come back to this window to readjust the level after you begin recording.

Your preferences are now set to use the USBPRO with Windows 7/10 with the recording program of your choice.

Product structure

Mute

Gain control

Headphone control

Headphone input

USB input

Microphone setup

For best results the microphone should always be as close to the source as possible.

Why do we recommend close miking? Because it will sound better - as distance from any source increases the apparent volume drops and as apparent volume drops it approaches the ambient noise level of the space. As the distance from the source increases, we have to increase the microphone's analog input gain to maintain the same relative level, making the microphone more sensitive to extraneous noises that we don't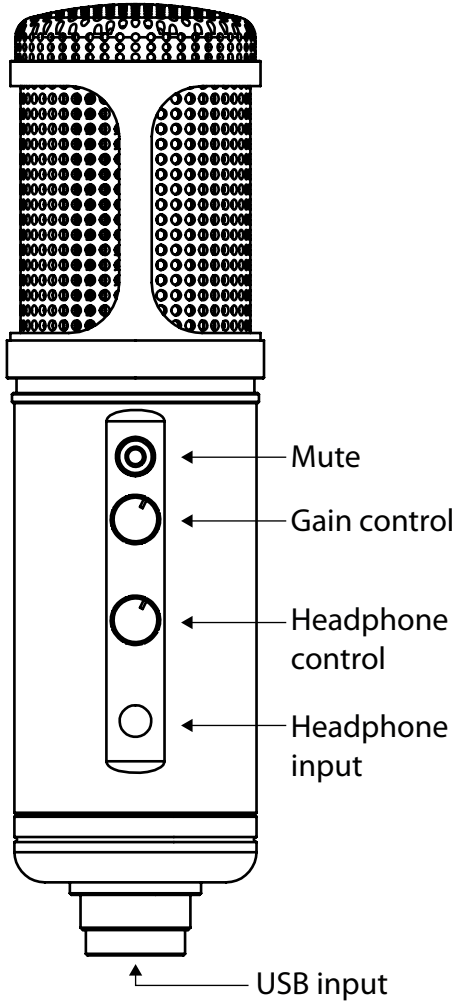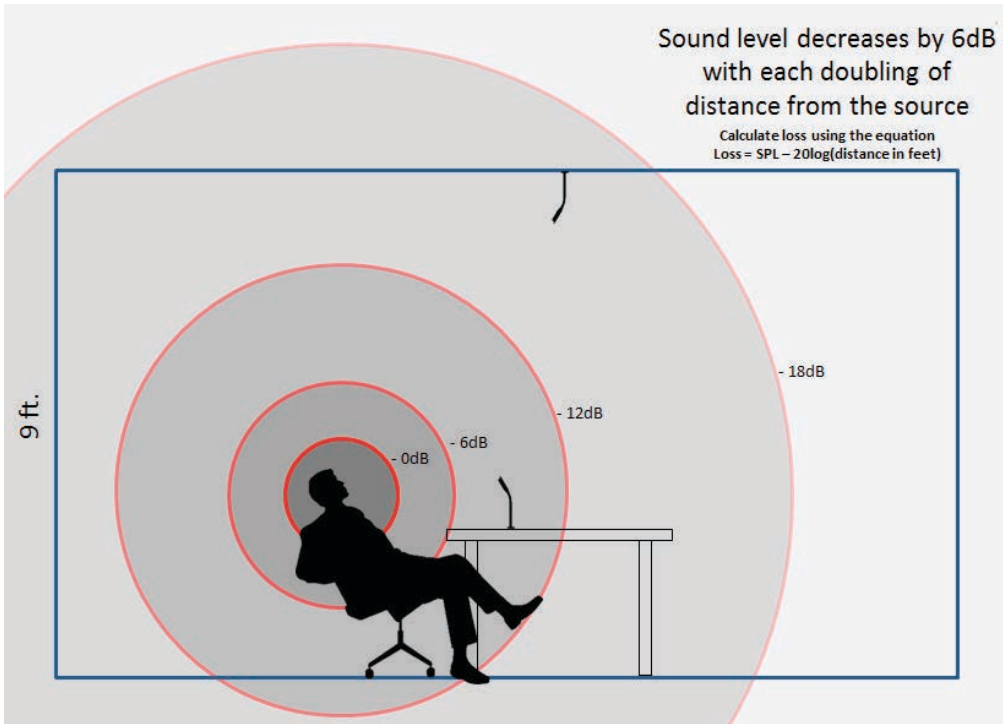 want to hear in our program material - noises such as projector fans, squeaky chairs, rustling papers, or cars driving past the building.

If there are no obstructions, sound waves (acoustic energy) move outward from a noise source in a spherical shape. As the energy moves away from the source the total amount of energy remains the same, but it gets distributed over an ever-increasing area. Eventually it is dispersed to the point where it is indistinguishable from the ambient acoustic energy (or background noise). For every doubling of distance from the source (doubling of radius of the sphere) the energy is spread over four times the surface area, reducing the volume by one half. In terms of acoustic energy we say that this equals a drop (or loss) of 6 dB-SPL.

The -6dB-SPL per doubling of distance rule applies to a perfect free-field scenario, where acoustic energy is free to dissipate equally in all directions. In the real world there are obstructions such as floors, walls, ceilings, and more which can reflect the energy back into the same acoustic space. These reflections will be constructive (adding energy) or destructive (negating energy) depending upon the frequency of the sound and the distance from the origin and the obstructions. In an enclosed space, it is more typical for levels to reduce at an average of 4.5 to 5dB-SPL per doubling of distance, due to reflected energy from boundary surfaces.

Sound level decreases by 6dB with each doubling of distance from the source

Calculate loss using the equation
Loss = SPL – 20log(distance in feet)

9 ft.

- 18dB
- 12dB
- 6dB
- 0dB

Signal-to-noise and Direct-to-reverberant ratios

The signal-to-noise ratio is a measure of a desired signal's level compared to the undesired background noise level of the room. To be understood, a speech signal must be at least 6dB above, or twice as loud as, the background noise level. This means that the speech must have a minimum signal-to-noise ratio of 6dB - recall that dB is a ratio expression, 6dB denotes a 2:1 ratio. Obtaining higher signal-to-noise ratios will result in higher quality signals. There are only two ways to raise the signal-to-noise ratio: either lower the background noise level of the room (which is usually not practical) or move the microphone closer to the talker. Noise reduction algorithms can also artificially increase the signal-to-noise ratio, but they can sometimes introduce artifacts into the signal.

The direct-to-reverberant ratio is another important measurement for speech intelligibility. When someone speaks in a room, the sound of their voice travels in a straight line directly from their mouth to the microphone. However, it also travels in many other directions, bouncing off of various surfaces in the room, and those reflections or reverberations are also picked up by the microphone. The direct-to-reverberant ratio is a measure of the level of the direct sound compared to the level of the reverberant sound that is picked up by the microphone. The more direct sound the microphone picks up, the easier it is to understand the speech. Imagine you're standing far away from someone in a highly reverberant area (like a cathedral) and trying to listen to them speak. The reason it is hard to understand them is because of their low direct-to-reverberant ratio. There are only two ways to raise the direct-to-reverberant ratio: either (1) acoustically treat the room to absorb reflections and reduce reverberation (which is often impractical) or (2) move the microphone (listener) closer to the talker.
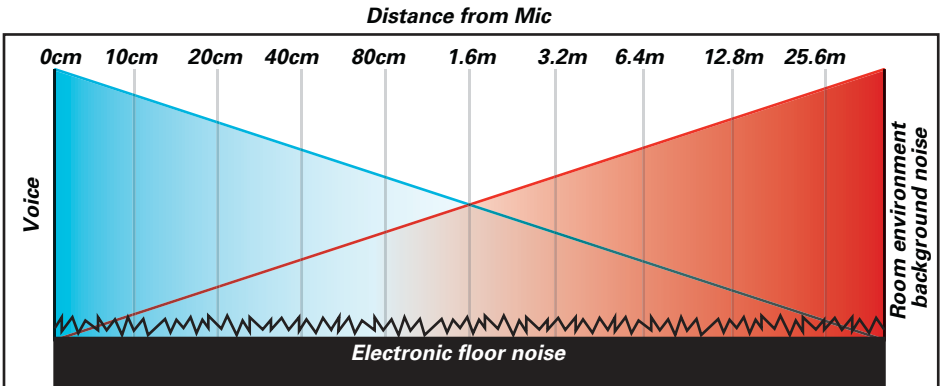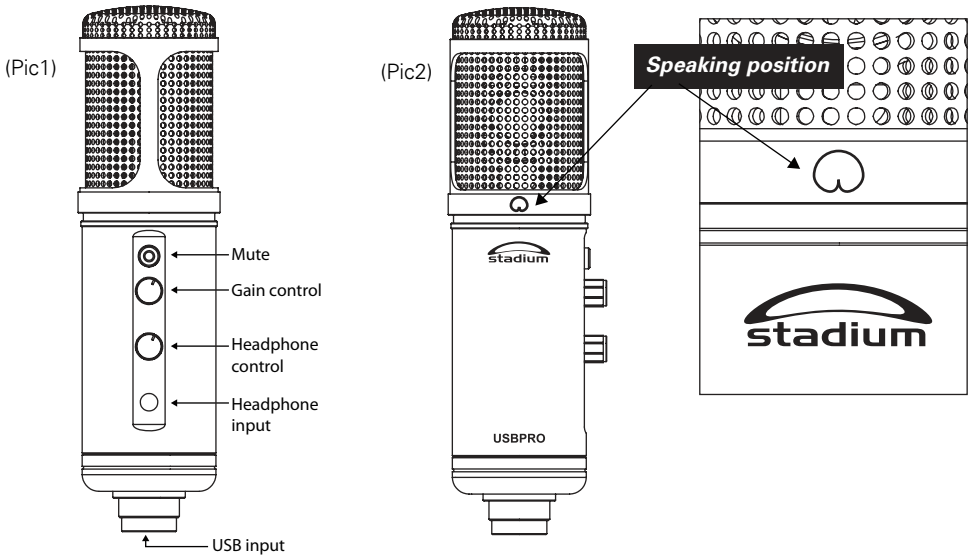
Gain control & software information

Gain control on the Mic

Gain control on the Mic is one of the most important things you can do to maximize the signal to noise ratio for voice recordings. The gain is used to adjust the strength (i.e. voltage level) of the input signal. The gain control is the first electronic circuit an audio signal encounters after it leaves the microphone. It is important to position the microphone directly in line (on axis) with the person speaking/ singing or instrument (or other sound source) to achieve the best frequency response of the microphone. (See Pic1) As this microphone is **directional,** this requires the user to speak into the microphone with the polar icon logo (◯) positioned **towards the mouth.** (See Pic2).

Note: Adjusting the gain on the microphone, and or adjusting gain using your computer software can have completely different outcomes. Usually the microphones gain is adjusted first then secondly using the software.

(Pic1)   (Pic2)   **Speaking position**

Mute
Gain control
Headphone control
Headphone input

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USBPRO

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USB input

Selecting software

You have many choices in recording software. Audacity, available for free online at http://audacity.sourceforge.net/, is a widely used software program

Mobile phone and tablet usage

The USBPRO can be used with mobile phones and tablets but requires a USB adapter (Not supplied)

Setting your software levels

Correct adjustment of microphone level is important for optimum performance. Ideally, the microphone level should be as high as possible   without overloading the input of your computer. If you hear distortion, or if your recording program shows levels that are consistently overloaded (at peak levels), turn the microphone volume (or level) down, either through your control panel (or system preferences) settings, or through your recording software. If your recording program shows insufficient level, you can increase the microphone gain either from the control panel (or system preferences) settings or through your recording program.

No further microphone level adjustments should be needed, as long as the acoustic input does not change significantly.

Near & far field record setup

For Near field recordings the distance from the mouth should be about 1 inch, or 10 - 40mm for optimal recording. For use in speaking/singing applications, the ideal placement for the microphone is directly in front of the person speaking/singing. As the target signal is maximized being so close to the Mic, the gain controls on the Mic can be turned down. It is also recommended to use a wind sock or pop filter to dampen pop on p and d sounds.

For Far field recordings the distance to the Mic is greater and the acoustic energy of you voice gets smaller as you get further away. Thus more gain is needed, but with more gain comes more background environment noise. Experiment with different Mic placements to find the best sound for your particular setup .
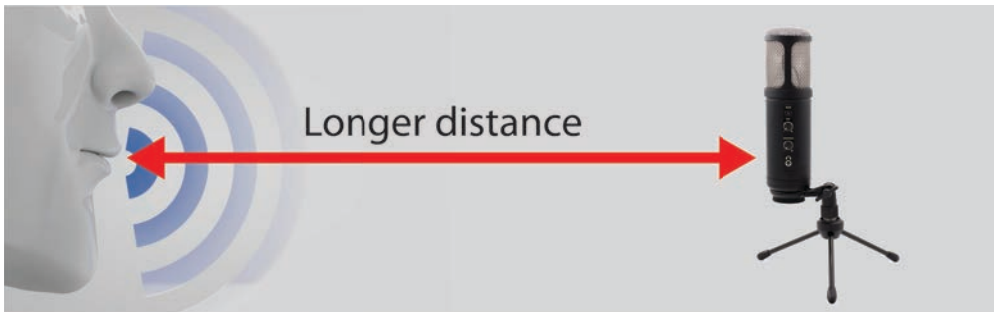
USBPRO Specifications †

Type: Condenser
Pickup: Omni (Cardioid)
Frequency response: 30Hz – 18 KHz
Sensitivity: -36 dB (+/-2 dB) (0 dB =1V/Pa at 1 KHz)
14mm back electret diaphram
Dynamic range: 89 dB
Max Input SPL 130dB (at 1 KHz, 1% T.H.D)
Sample Rate: 16 bit/48KHz
Outputs: USB & 3.5mm stereo jack
THD+ N= 0.01%:
Stereo output power: 400mW
Power supply: computer USB power

System Requirements:

Macintosh: Mac OS X; USB 1.0 or 2.0; 64 MB RAM (minimum);
Windows: XP/Vista/Windows 7; USB 1.0 or 2.0; 64 MB RAM (minimum)

† Specifications are subject to change without notice.

Inclusions:

1x USB microphone
1x Tripod desk stand
1x USB cable (1.8M)
1x Windsock
1x Owners' manual

Polar Pattern

Frequency Response Graph

125HZ ---
500HZ ·····
1000HZ ——
2000HZ -·-
4000HZ -··-
8000HZ ····
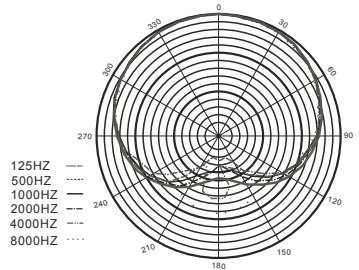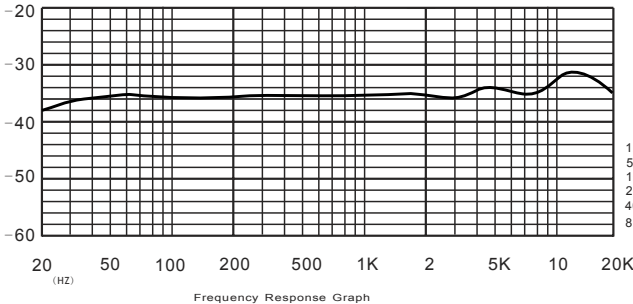
Technical Assistance:

If you need assistance setting up or using your Stadium product now or in the future, call Stadium Support.
Australia
TEL: 03 – 8587 8898
FAX: 03 – 8587 8866
Mon-Fri 9am – 5pm AEST
Please retain this user guide for future reference

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