Description

The 3Dio FS, FS XLR and FS Pro II are stereo binaural microphones. The literal translation of the word "binaural" means ‘of, relating to, or used with both ears’. How it works is that there are microphone capsules inside the two prosthetic ears. When listening to the microphone through headphones, it mimics the way humans hear the natural world. In other words, it picks up sounds the way that your ears pick up sound. The shape of the prosthetic ear manipulates the sounds and mimics a real human ear. It allows the listener to use spatial cues and localize sounds originating from above and below, in front and behind, and to the left and right of the microphone using only two channels. It transports the listener to the space where the recording took place.

The 3Dio FS microphones have a multitude of applications, in particular:

- In the recording studio for tracking and recording virtually any instrument.
- Field recording of the natural outdoor environment. The sensitive capsules capture such things as planes flying overhead, birds chirping, distant thunder, footsteps, etc.
- Simple stereo recordings in acoustically complex environments containing a plethora of sounds (airport terminals, tradeshows, highly populated areas, etc.).
- Measurement and calibration of open (over the ear) headphones.
- Filmmaking for spatial relevance and acoustic immersion.
- Podcasts for realistic ‘at the table’ perspective of conversations and interviews.
- YouTube® videos for a professional audio experience.
- Assessment and evaluation of noise in industries looking to measure the impact of acoustic reverberation of various materials.
- Hobbyists looking to record in full 360° professional audio.

Microphone Highlights

The 3Dio FS and FS XLR microphones contain integrated Primo EM172 microphone capsules inside each of the prosthetic ear canals. The capsules are small diaphragm, omnidirectional condenser microphones that are extremely sensitive and quiet. The matched Primo EM172 capsules have a very natural presence which are perfect for binaural recordings.

The 3Dio FS Pro II model contains integrated DPA 4060 microphone capsules inside each of the prosthetic ear canals. The FS Pro II delivers a very sensitive and natural binaural recording with a full 20 – 20 kHz frequency response. The extremely low noise floor of the DPA 4060 capsules results in a very open and dynamic binaural realism, especially during very delicate recordings. This sensitivity, coupled with the wide

dynamic range of the microphone capsules makes the FS Pro II ideally suited for professional studio recording and high-end binaural recording.

All 3Dio FS models deliver highly portable, professional quality binaural audio in the palm of your hand. The 3Dio FS microphone has a very warm and solid response in the low to mid-range frequencies. This brings out the punch as well as provides low-end support for bass-heavy sounds. The frequency response of the 3Dio FS and FS XLR models roll off slightly above 10kHz. This makes them excellent for recording instruments with loud high frequencies like drum cymbals or strummed acoustic guitars. It also prevents any harsh effects that are sometimes associated with binaural recordings using smaller capsules. The 3Dio FS microphones works well in windy conditions even without protection. Wind sounds realistic without affecting the binaural experience or overloading the microphones.

Features

- Omnidirectional-patterned capsules for true binaural capturing
- Realistic human ear pinnae for life-like attenuation and amplification from all directions
- Low susceptibility to RFI
- Wide dynamic range of 100 dB (FS Pro II) & 108 dB (FS and FS XLR)
- High sensitivity and ultra low noise
- Compact design ideal for field recording and transporting
- Performs well over a wide range of temperature and humidity conditions
- 1/8” (3.5mm) stereo TRS output jack
- Two (2) female XLR output jacks (FS XLR & FS Pro II only)
- 48V Phantom power compatible (FS XLR & FS Pro II only)
- Rugged aluminum chassis
- Bass roll-off switch beginning at 160 Hz (applies to 1/8” TRS output only)
- 8” – M2M 1/8” stereo TRS cable included
- Easily exchangeable 9V battery (included) for powering microphone (when not using phantom power)
- Comes standard with a removable 5/8” microphone stand adaptor
- The base of the microphone contains a ¼”-20 female thread mounting hole that can be connected to a hot-shoe adaptor or used to mount directly onto a tripod or grip handle.

How it Works

Sound can originate from any direction. Above us, below us, in front or behind, left or right or any combination of these. The shape of the human ear has evolved over time, allowing us to pinpoint not only the location of sounds, but distance as well. Our brains have been trained our entire lives to know where sounds are coming from. Because the 3Dio FS microphones are shaped like a human ear, they use the same three primary methods of localization that our ears do:

Pinna Filtering – The ears of the microphone transform a sound's frequencies in unique ways depending on the elevation or the front/back relationship of the sound relative to the listener. This is called pinna filtering. Sounds bounce off the outer ear (pinnae) and change the way sound waves enter the ear canal. These transformations of a sound's frequencies are what allow us to determine the elevation or the front/back location of the sound source. As a sound changes elevation, the way in which the sound reflects off the pinnae changes as well, and this change is recognized by our brains to let us know whether a sound is going up or down. The same thing happens when a sound is either in front or behind us. Sound waves coming from behind us are slightly attenuated and enter our ears differently than if the sound was coming from in front of us.

Interaural Time Difference (ITD) – The distance between the ears of the 3Dio FS microphones are similar to the average width of the human head. The reason this is important is because sound waves coming from the left or right arrive in each ear at slightly different times. This time difference is incredibly small as sounds waves travel at about 340 meters per second. However, our brains are impressively able to identify this difference and use it to determine the direction a sound is coming from. For example, if a sound comes from the right of where we are facing, the sound wave enters our right ear a fraction of a second before it enters our left ear. If the distance between the ears of the microphone were smaller than the average width of the human head, the ITD would be smaller and thus our brains would have a tougher time identifying the left or right location because we have experienced roughly the same ITD our entire lives.

Interaural Level Differences (ILD) – In conjunction with ITD, there are differences in the volume of a sound depending on which direction it is coming from. For example, a sound coming from our right will be slightly quieter in our left ear because our head shadows the sound from directly entering our left ear. This shadowing causes an interaural level difference, or ILD. The further the sound wave must travel, the less intensity (or volume) it has. This ILD also helps our brains identify the location of a sound.

How to Use

All 3Dio FS microphones, like most microphones, are designed to be used with a digital recorder, camera, audio interface, or plugged into a mixing console. The microphone cannot be plugged directly into a computer or smart phone without first being connected to preamplifier of some sort. A preamplifier is an electronic device (often integrated into a camera, digital recorder, or audio interface) that boosts a weak signal coming from a microphone. A preamplifier can also be purchased as a separate stand-alone unit.

In order to capture the audio signal coming from the 3Dio microphone, you will need a device to record with. Many digital recorders include a preamplifier built in. If you are plugging any 3Dio FS model directly into an audio interface or mixing console, you will also need a device to record the audio to. This can be achieved with a computer, analog tape machine or digital studio workstation (many workstations feature built-in preamplifiers).

The 3Dio FS microphone contains a 1/8” (3.5mm) stereo TRS output. This output can be used to connect to an electronic device and the output cable (included) automatically splits the signal into left/right channels.

The 3Dio FS XLR & FS Pro II models contain two male XLR output jacks in addition to the 1/8” stereo TRS output. The 1/8” output is provided on the 3Dio FS XLR & FS Pro II models for recording with a device that cannot provide phantom power to the XLR outputs.

Regardless of the output type used, be sure to fully pan the left and right signals appropriately to isolate the signals. This will ensure there is no signal bleed (left signal in the right ear and vice versa) in order to achieve true left/right isolation (required for binaural).

All FS microphones contain a power switch. This power switch activates the use of the internal 9V alkaline battery to power the microphone. The power switch is meant to be used only when recording through the 1/8” TRS output and it does not apply when using the XLR outputs. When providing phantom power to the XLR outputs, the power switch is bypassed. It is recommended that the power switch be turned off when the microphone is not in use, or when supplying phantom power in order to preserve battery life.

All FS microphones contain a bass roll off switch. The roll off frequency begins at 160 Hz. This roll off switch is only applied to the 1/8” TRS output signal and does not work with the XLR outputs. The reason being is that a bass roll off can be applied externally by a mixing console or digital recorder.

Storage

When the FS microphone is not being used, be sure to turn the power off. We recommend that the microphone be stored in the box it was purchased in. The box is designed to protect the microphone from damage. Alternatively, the microphone can be stored on a microphone stand or tripod. While the microphone can rest on a shelf or hard surface, the prosthetic ear disk may become permanently warped if stored for extended periods of time on either the pinnae of the ear or the disk edges.

Cleaning

The chassis and prosthetic ears can be cleaned using a paper towel moistened with water. Avoid using abrasive or harsh cleaners as they can have an adverse effect on the ears. Avoid touching the microphone capsules. Do not use canned air to clean the ears.

Important Product Information:

WARNING: Failure to follow these safety instructions could result in fire, electric shock, or other injury or damage to your microphone or other property. Read all safety information below before using your microphone.

- Do not send an audio signal to the microphone. The microphone only contains audio outputs. Sending an audio signal from a device (digital music player, smart phone, camera, digital recorder, etc.) to the microphone may damage the internal components and/or the microphone capsules themselves.
- Do not send phantom power to the 1/8” TRS output. Sending phantom power through the 1/8” TRS output jack may damage the internal components and/or the microphone capsules themselves.
- Do not subject the microphone to extreme weather conditions. Extreme hot or cold environments may cause the microphone to not work properly and may even cause permanent damage to the internal components. We recommend limiting use and storage of the microphone to a temperature range between 32° F (0° C) and 100° F (38° C). Limit exposure to moisture as well. The microphone is designed to work in a dry environment and may become damaged if exposed to wet conditions. Do not submerge the microphone in any liquid and do not expose the microphone to rain.
- All 3Dio FS microphones contain a 9V alkaline battery. Do not tamper with the battery.

Frequently Asked Questions

One side of the microphone has a weak signal. What is wrong?
Try replacing the internal 9V battery. When the battery is low, typically one side of the mic will start to produce a weak signal.

How do I replace the internal 9V battery?
To replace the battery, you'll need a new 9V alkaline battery and a Phillips-head screwdriver.

1) Turn the power switch to 'Off'.

2) Unscrew the 4 black screws from each corner of the microphone chassis.

3) Remove the lid and replace the battery.

4) Replace the lid and the screws.

5) Turn the power switch to 'On'.

When the microphone is not in use, turn the power switch to ‘Off’ to preserve the battery life.

How do I record using my smart phone?
Recording with the 3Dio microphone on a smart phone requires an audio interface that will act as a pre-amplifier for the microphone by boosting the signal. There are many different solutions on the market that are compatible for different smart phones. When looking for a device to use for recording into your phone, there are two important factors to look for:

- Make sure the device is compatible with your phone and OS version.
- Make sure the device has two inputs (or one stereo input).

Once you have a pre-amp device, you’ll need an app to record onto your phone. There are many different apps available in the app store. Be sure to choose one that allows for stereo recording.

Can I plug my 3Dio microphone directly into my computer?
No. Like most microphones, 3Dio microphones require a pre-amplifier to boost the output audio signal. Plugging the microphone directly into a computer will result in a very quiet to inaudible signal. We recommend a portable digital recording device or

audio interface that will boost the signal to line level. For more information, see the ‘How to Use’ section of this user guide.

Disposal and Recycling Information

In accordance with local laws and regulations your product and/or its battery should be disposed of separately from household waste. When this product reaches the end of its life, take it to a collection point designated by local authorities. Some collection points accept products for free. The separate collection and recycling of your product and/or its battery at the time of disposal will help conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment.

Battery Disposal Information

Dispose of batteries according to your local environmental laws and guidelines.

Have a question? Send us an email using our Contact Us form.