

MTR231

OWNER'S MANUAL



SAMSON®

Introduction

Thank you for purchasing the Samson MTR231 multi-pattern studio condenser microphone. Samson has a long history of developing high-quality microphones for live and recording applications. The MTR series is our latest and most advanced line of microphones featuring stunning sound reproduction and innovative design.

The MTR231 will quickly become your favorite tool in the studio, whether capturing vocals, acoustic or electric instruments. The microphone features a dual 1" gold sputtered diaphragm with three selectable polar patterns, providing an extended flat frequency response ensuring accurate, linear reproduction of your music. With its wide dynamic range and handling high sound pressure levels, the MTR231 excels at picking up everything from very soft, to loud thunderous sounds.

For additional isolation from unwanted noises, the microphone includes the MSM1 shockmount. The revolutionary new design also allows for the MPF1 pop filter to be mounted directly to the microphone making setup a breeze. A carry case is included for transportation and storage of the microphone. It is recommended keep the microphone in the case when not being used.

In these pages, you'll find a detailed description of the features of the MTR231, as well as instructions for its setup and use, and full specifications. If your microphone was purchased in the United States, you'll also find a warranty card enclosed—don't forget to fill it out and mail it in so that you can receive online technical support and so that we can send you updated information about this and other Samson products in the future. Also, be sure to check out our website (www.samsontech.com) for complete information about our full product line.

We recommend you keep the following records for reference, as well as a copy of your sales receipt.

Serial number: _____

Date of purchase: _____

Dealer name: _____

With proper care and maintenance, your MTR231 will operate trouble-free for many years. Should your microphone ever require servicing, a Return Authorization (RA) number must be obtained before shipping the microphone to Samson. Without this number, the unit will not be accepted. Please call Samson at 1-800-3SAMSON (1-800-372-6766) for an RA number prior to shipping your unit. Please retain the original packing materials and, if possible, return the unit in its original carton. If your MTR231 was purchased outside of the United States, contact your local distributor for warranty details and service information.

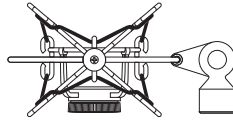
Features



- Large diaphragm multi-pattern studio condenser
- Dual 1" gold-sputtered capsule
- Smooth and transparent sound reproduction
- Selectable pick-up pattern: Omnidirectional, Cardioid, Figure-8
- 48 volt phantom power operation
- 10dB attenuation pad
- Internal capsule shock mounting
- Extended smooth frequency response
- Durable die cast construction
- Gold-plated XLR connector

Accessories

- MSM1 shockmount
- MPF1 Pop filter
- Carry case



Powering

The MTR231 is a condenser microphone and therefore requires 48V phantom power. Phantom power is provided by a mixer's preamplifier channel or if necessary, an external phantom power supply and sent to the microphone along a balanced microphone cable.

To ensure the longevity of your equipment, and is good mixing etiquette, always turn down the master fader and monitor controls to zero when switching the phantom power on or off.

Poor microphone performance can be attributed to phantom power issues. If you notice that the microphone is exhibiting reduced signal output, increased noise, or decreased headroom (distortion), there may be an issue with the phantom power supply or the microphone cables.

Setting the Microphone Level

When connecting the MTR231 to a mixer, use a balanced cable and be sure that the input is balanced and connected to a channel that is set for microphone level. Also, be sure that the phantom power is engaged. Most mixers and recorders of reasonable quality will offer a microphone input with mic trim (usually called Trim or Gain) control. The purpose of the mic trim control is to optimize the amount of good signal over any noise that may be associated with the mixer's electronics. A good mic pre with trim will have a peak or clip indicator. To set an optimal level on the mic, place the MTR231 in front of the desired sound source and slowly raise the mic trim control until you see the PEAK LED light up. Then, turn the mix trim control down until the LED does not light any more. For most applications, the ideal setting is to set the trim control as high as possible without lighting the peak indicator.

Polar Pattern

An important characteristic of any microphone is its directionality or polar pattern. The MTR231 features a dual-membrane capsule allowing for a choice of three individual polar patterns: omnidirectional, unidirectional (cardioid), and bidirectional (figure-8). The microphone pattern can be selected using the three-position slide switch below the right side of the grill. Each pattern has distinct pick-up characteristics with respect to the sensitivity and frequency response to sounds arriving from different directions. The following section discusses some of the features of each pattern, to help you choose the best setting for your application.

Omnidirectional - The omnidirectional setting reproduces sound from all directions, (including off-axis), with an even frequency response, which makes it resistant to the phenomenon known as proximity effect. It captures a greater amount of ambient sound than the other settings, and thus will include more of the room sound than when using a directional setting. The omnidirectional setting is great for recording ensemble performances including group vocals, brass, woodwind, and other instruments with the artists facing each other in a circle around the microphone. To select the omnidirectional pickup pattern, set the pattern selection switch to the left position, indicated by the circle icon.

Unidirectional (cardioid) - The cardioid pickup pattern is the most widely used for studio and live miking applications. It captures sound in front of the microphone and rejects sound from the sides and back, which allows for better separation of instruments in the studio, and picks up more of the instrument sound in relation to the sound of the room. The separation also allows for more control and more gain before feedback in live sound reinforcement situations. To select the cardioid pickup pattern, set the pattern selection switch to the center position, indicated by the “heart-shaped” icon.

Bidirectional (figure-8) - This setting captures sound directly in front and back of the microphone while rejecting sound on the left and right sides, and has minimal off-axis frequency response deterioration. It is very useful in a variety of stereo microphone techniques. The figure-8 pattern can be used to simultaneously capture two instruments or vocalists by positioning the microphone directly between them, so one is addressing the front of the microphone and the other the rear. To select the figure-8 pickup pattern, set the pattern selection switch to the right position, indicated by the “8” icon.

See the section on “Microphone Placement” on page 8 and the section on “Stereo Microphone Techniques” on page 10 for some considerations when placing the microphone in different recording applications.

10dB Attenuation Pad

The MTR231 includes a 10dB attenuation pad that can be selected with the slide switch located below the grill, which is used to prevent overloading the onboard preamplifier by lowering the input sensitivity of the microphone preamplifier circuit. Setting the switch to the left (0dB position) the control is bypassed and there is no effect on the signal. When the switch is set to the right (-10dB position) the input sensitivity of the microphone will be lowered by 10dB. This is useful when close miking loud sound sources with very high transient sounds, such as drums, cymbals or brass instruments.

Before setting the attenuation pad switch to the -10dB position, it is advisable to perform a sound check and to optimize the input signal levels using proper gain staging. If distortion is apparent when the performer is singing or playing their instrument at maximum level, work backwards through the signal chain to find out where the distortion exists. First check the microphone preamp level. If it is set to the minimum position and there is distortion, activate the preamplifier pad switch. If the signal level drops and the distortion goes away, then the microphone preamp was overloaded. If the level drops but the distortion remains, then the overload is happening at the microphone input. Set the attenuation switch to the -10dB position. If the distortion still remains, then either have the performer lower the level of their instrument or move the microphone further away from the sound source.

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Microphone Placement

In order to maximize the quality of the sound you are capturing, you must pay careful attention to the placement of your MTR231 and how it is positioned for the instrument or vocalist. When the MTR231 is set to the cardioid polar pattern, it exhibits a phenomenon known as “proximity effect” which is a resulting change in the frequency response of a microphone based on the position of the microphone capsule relative to the sound source. In order to get the best frequency response, start by pointing the microphone directly on axis with the sound source. You can change the sound characteristics that the microphone picks up by changing the position of the microphone. Rotating the microphone away (off-axis) from the sound source will decrease the sensitivity to higher frequencies. Experimentation and experience is the best way to find out what sounds best for your recordings. Below are some tips for when setting up and using your MTR231 in typical applications.

Vocals

With the microphone pattern switch set to the cardioid position, place the microphone directly in front of the artist so that the microphone grille is between 6 and 24 inches away. The closer the vocalist moves to the microphone, the more the bass or low response increases.

As the vocalist moves away from the microphone, the tone becomes more natural as the low frequency

rolls off. To achieve the fullest sound, the vocalist should aim the microphone center line towards their mouth. If some consonants such as ‘P’ and ‘S’ seem to jump up in level, rotate the microphone a little bit away from the artist so that sound arrives at the microphone slightly off-center. It is preferable to prevent these peaks through the use of the MPF1 external pop filter. If recording a group of singers, ensure that they position themselves around the front of the microphone close to one another.



Acoustic Guitar

There are a variety of ways that the MTR231 can be used to mike an acoustic guitar. Optimal microphone placement will depend on the type of instrument, and what kind of sound you’re looking to capture. It may be necessary to experiment with various positions to achieve full and balanced tone. When miking a standard steel string acoustic, it is suggested that you begin with the microphone at a distance of 6–12 inches from the sound hole, positioned slightly off-axis, and pointing towards the edge of the fingerboard. From this position, moving the microphone towards the sound hole will cause the mic to capture more low frequencies. If, instead, you wish to capture more high-end, or to remove any unwanted booming sound, move the microphone toward the fingerboard. Unlike a steel string acoustic guitar, the sound of a nylon string acoustic guitar that is played by

Microphone Placement

finger picking is usually naturally warmer. To record an even, full tone, it is suggested that you begin by positioning the microphone 3–6 inches above the center of the bridge. This will help emphasize the higher frequencies and pick up the attack sound of the finger picking. If the microphone is picking up too much low frequency from the sound hole, move the microphone so that it is slightly off-axis from the guitar. If you have a pair of MTR231 microphones, try one positioned at the fingerboard and the second over the bridge of the guitar, or have one microphone positioned close to the guitar and the second a few feet away to pick up the sound of the room, blending the two sources together.

Piano

The piano is a very challenging instrument to capture, and there are numerous microphone techniques that can be used. For close-miking the piano, position the MTR231 just inside the piano, centered between the soundboard and the open lid. The closer you move the microphone toward the instrument the more low frequencies the microphone will pick up. For an ambient recording like that used in a classical performance, position the microphone outside the piano, facing into the open lid. For a more contemporary ensemble sound, place two MTR231 microphones in the piano, positioning one over the bass strings and one over the high strings at a distance of 6–12 inches apart. When miking an upright piano with a single microphone, position the microphone just above and in front of the piano with the top open, centered over the instrument. If you have a pair of MTR231 microphones, position the microphones over the open top of the piano with one microphone over the bass strings and one over the high strings. You can also position two mics in front of the kickboard area approximately 8 inches over the bass and high strings.

Overhead Drum Kit

Thanks to its extended high frequency response and fast transient response, the MTR231 performs outstandingly when used as an overhead cymbal microphone. You can position one MTR231 on a boom mic stand directly above the kit pointing from front to back. For stereo miking, use two MTR231 microphones placed over the drum set at a distance of three to five feet. You can experiment with the exact placement depending on the size of the room and whether you're looking for an ambient or close-miked sound. In general, when miking a drum kit, it's a good idea to start with the overhead mics. Even though you use the overhead mics mostly for the cymbals, you can get the entire kit to sound great with just one overhead. Using overhead mics, it is easier to simply turn up your individual mics for more attack and thickness in the overall sound.

Stereo Microphone Techniques

The term “stereo” will be used here to describe different microphone techniques using multiple channels of audio to create a reproduction of the sound stage over a pair of loudspeakers. There are many approaches that can be used with two or more microphones, but we will focus on three methods: spaced microphones, X/Y coincident pairs and Mid-Side (MS).

Spaced Microphones - This technique utilizes two microphone placed 2-10 feet apart (sometimes a third microphone is used in the center). Traditionally, engineers have chosen omnidirectional microphones for this method which have a flat polar and frequency response, but include more of the reverberant sound of the room compared to the direct signal. This approach works well for smaller performance groups, such as chamber music, where specific imaging of instruments on the stereo plane is not crucial. The closer the two microphone are arranged, the wider the stereo image appears. The figure-8 pattern can be used for this technique but in this case, the microphones need to be angled in the direction of the sound source. Cardioid microphones are usually avoided due to the degradation of its off-axis frequency response.

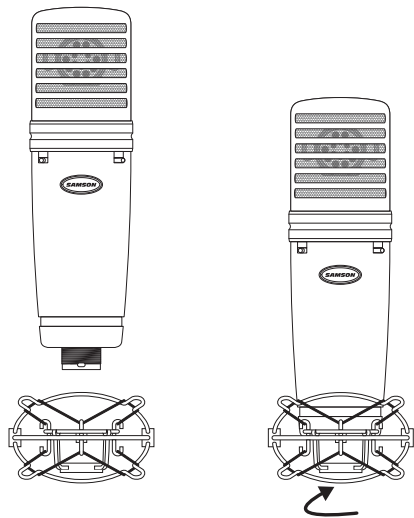
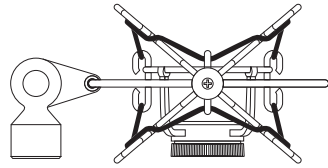
X/Y Coincident Pairs - This technique uses two cardioid microphones placed as close as possible together with a splayed angle of 90°-135°. The closer the angle between the microphones is to 90°, the more narrow, or mono, the soundstage will appear. Since cardioid pickup patterns tend not to reproduce signals off-axis, the result is a drier, more direct sound recording. A variation of the X/Y pairs, is the Blumlein configuration which utilizes two crossed figure-8 patterns. This technique can also be used as a variation to the Mid-Side method below. Using this approach produces a more natural sound, because the polar and off-axis frequency response is much better than the cardioid pattern, it captures more of the room’s reverberant sound. The disadvantage using two figure-8 microphones is that they will pick up sounds coming from behind the microphones, which may not be desirable.

Mid-Side (MS) - The MS configuration might be the most versatile and powerful technique of the three discussed. This arrangement typically uses a forward facing cardioid microphone for the “mid” portion, which is recorded equally to the left and right channels, and a side facing figure-8 microphone for the “side” component which is recorded to the left and right channel (with one of the channel’s polarity reversed). The MS method has the best stereo-to-mono compatibility, because when the two channels are summed to mono, the side microphone is completely cancelled. The width of the stereo field can be made wider or more narrow by adjusting the level of the “side” component relative to the “mid” component.

Shockmount

To isolate the MTR231 from external vibrations and prevent unwanted noises that are transmitted through the stand, the microphone can be fitted on the custom-designed MSM1 spider shockmount. Follow the steps below to install the microphone into the shockmount.

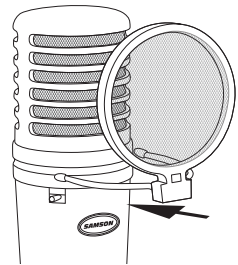
- Affix the shockmount onto a microphone stand or boom arm. The shockmount angle can be adjusted by loosening the thumb screw near the stand connection.
Note: Do not adjust the angle of the shockmount without loosening the thumb screw. If you do this, the shockmount may be damaged and you may void your warranty.
- Install the MTR231 into the MSM1 by fitting the microphone into the center of the web, positioning the MTR231 onto the bottom mounting plate with the Samson logo facing forward.
- Secure the MSM1 by rotating the threaded collar clockwise until tight.
- Loosen the thumb screw to adjust the angle of the microphone and position the MTR231 to the desired location. Once set, tighten the thumbscrew to secure the microphone in place.
Note: Be careful not to cross-thread or over-tighten the threaded collar or thumb screw.



Pop Filter

Sometimes when recording vocals certain plosive consonants (like hard “P” and “B” sounds) overload the input of the microphone which causes clipping and adds distortion to your recording. It is advisable to use a pop filter to reduce the effect of the blasts of air from vocalists when pronouncing words that include these hard consonant sounds. The pop filter also helps to protect the microphone element from moisture. The MTR231 features a unique design that enables the MPF1 pop filter to be mounted directly to the microphone.

To attach the MPF1 pop filter to the microphone line up the pop filter with the groove underneath the grill and press on until the legs snap onto the microphone body.



Technical Specifications

Transducer Type	Condenser
Polar Pattern	Omnidirectional, cardioid, figure-8
Frequency Response	20Hz–20kHz
Sensitivity	Omnidirectional: -39dB±3dB (0dB=1V/Pa 2kHz) Cardioid: -37dB±3dB (0dB=1V/Pa 1kHz) Figure-8: -33dB±3dB (0dB=1V/Pa 1kHz)
Equivalent self noise	16dB
Dynamic Range	118dB
Signal-to-noise	78dB
Output Impedance	50Ω ±30% (at 1kHz)
Maximum SPL	132dB
Powering.	48V phantom power
Connector	3-pin, gold plated XLR
Dimensions	∅54mm x 191.7mm
Weight.	552g

At Samson, we are continually improving our products, therefore specifications and images are subject to change without notice.

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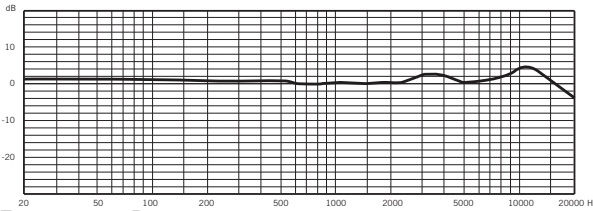
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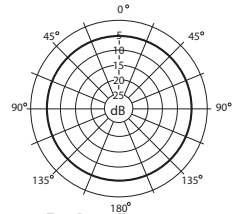
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Technical Specifications

Omnidirectional

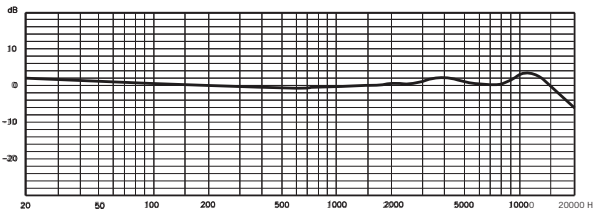


Frequency Response

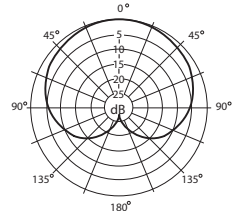


Polar Pattern

Cardioid

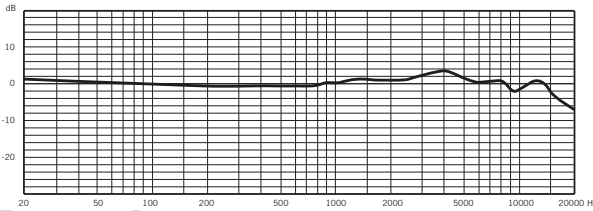


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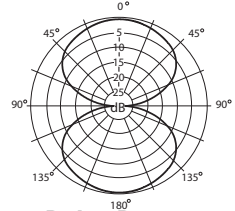


Polar Pattern

Figure-8



Frequency Response



Polar Pattern