



SOUND DEVICES



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MP-1 Microphone Preamplifier

User Guide and Technical Information



General Description

The MP-1 from Sound Devices is a portable, battery-powered microphone preamplifier with phantom power. Designed for high bandwidth 96k/24 digital productions, this studio-quality mic pre is ideal for critical radio, television, and film production applications.

With its rugged mechanical and electrical construction, compact size and high-quality components, the MP-1 is extremely durable and easy to use. This highly reliable mic preamp will provide years of superb audio performance under the most punishing field conditions.

Features

Audio performance

- Maximum of 66 dB of gain, adjustable in eleven discrete steps for accurate, repeatable gain settings.
- Dynamic range exceeding 120 dB.
- 20 Hz to 50 kHz audio bandwidth.
- High immunity to RF interference due to transformers, RF filtering, and all-metal construction.
- High current line output driver capable of driving very long cable runs.

Transformer balanced

- Premium quality input transformer provides superior sonic quality and freedom from interference problems.
- Custom-designed output transformer provides line driving ability with freedom from interference problems.

Limiter

- Extended range peak limiter via dual opto-isolators makes unit virtually "unclippable".

Battery power

- Internal battery power (two AA) for convenient, low cost power.
- Battery life greater than 24 hours (phantom power off).

Durable Mechanical Construction

- High strength extruded aluminum chassis with protective metal end rails to withstand punishing field conditions.
- Easy access battery compartment for quick battery changes.

Phantom power

- Selectable 48-volt and 12-volt phantom power for condenser and dynamic microphones.

High pass filter

- Two selectable corner frequencies, 80 and 160 Hz, 6 dB per octave.

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Specifications

Gain:

0 dB to 66 dB input to output, switch selectable

Gain Accuracy:

+0.6, -0.1 dB with reference to front panel gain markings
(150 ohm source, 100k ohm load impedances)

Frequency Response (see graph below):

20 Hz – 22 kHz, +0.1, -0.5 dB
-1 dB at 50 kHz
(relative to 1 kHz level with 150 ohm source)

Equivalent Input Noise:

-126 dBu (-128 dBV) maximum
(150 ohm source, flat weighting, 22 – 22 kHz bandwidth,
gain setting 36 dB or greater)

Output Clipping Level:

+22 dBu minimum with 100k ohm load
+20 dBu minimum with 600 ohm load

Input Clipping Level:

+4 dBu minimum at the 0 or +18 dB gain setting

Dynamic Range:

122 dB minimum at the +18 dB gain setting

THD + Noise:

0.05% maximum
(from 50 Hz to 22 kHz @ +4 dBu output level,
22 Hz - 22 kHz filter bandwidth, +46 dB gain setting)

Common Mode Rejection Ratio:

100 dB minimum at 80 Hz
60 dB minimum at 10 kHz

Input:

Transformer-balanced, 2000 ohm input impedance

Output:

Transformer-balanced, 130 ohm output impedance

Low Cut:

80 Hz or 160 Hz (switch selectable), 6 dB per octave

Phantom Power:

12V or 48V (switch selectable) per DIN 45 596 specification

Limiter:

Limits to +17 dBu output level
10:1 limiting ratio
5 mS attack time, 100 mS release time
Amber/Red LED indicates limiting/clipping

Internal Voltage Rails:

+15 V and -15 V, regulated

Power:

2 AA batteries, 24 hours life typical with +4 dBu signal into
600 ohms, no phantom power

Power LED:

Green indicates power and good battery.
Red indicates power and low battery. LED turns red when
approximately 4 hours of battery life remain.

Polarity:

Mic input to line output is non-inverting

Operating Temperature Range:

0 to 70 degrees C
32 to 160 degrees F

Dimensions:

43 mm x 94 mm x 140 mm (h x w x d)
(1.7" x 3.7" x 5.5")

Weight (unit only):

0.56 kg
1.24 lbs.

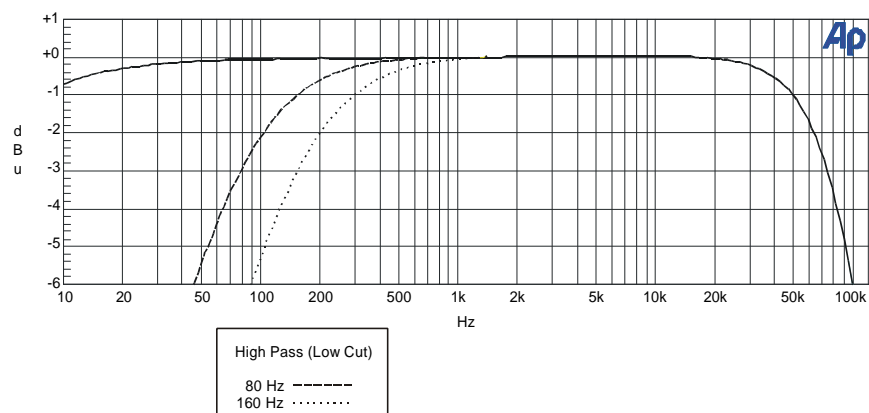
Weight (packaged):

0.86 kg
1.90 lbs.

Certification:

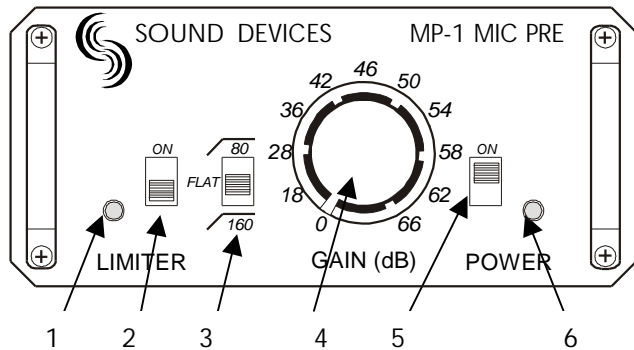
Meets FCC Part 15 Class B, Eligible to bear CE mark (see
conformance statement)

MP-1 Frequency Response



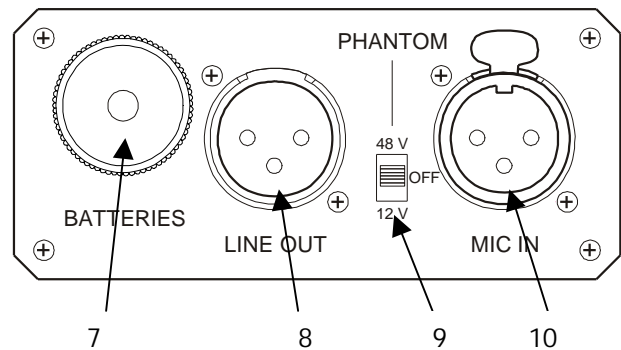
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Front Panel Controls and Indicators

1. **LIMITER/Peak LED**
Bi-color LED illuminates red at 3 dB below clipping; illuminates amber to indicate limiter activity.
2. **LIMITER Switch**
Activates the peak limiter. Limits to +17 dBu output.
3. **High Pass Filter Switch**
Three-position switch selects inserts an 80 Hz or 160 Hz corner frequency filter, 6 dB per octave. Center position of switch removes the filter from the signal path.
4. **Rotary GAIN Switch**
Selects the amount of gain from input to output, adjustable in 11 increments.
5. **POWER Switch**
Powers the unit when switch is in the up position.
6. **POWER LED**
Bi-color LED illuminates green when the unit is powered and changes to red when approximately four hours of battery life remain.



Back Panel Connectors and Controls

7. **BATTERY Compartment**
Requires two AA batteries for operation. Insert positive (+) end of battery first.
8. **LINE OUT**
Transformer balanced XLR line-level output. +22 dBu peak output level.
9. **PHANTOM Power Switch**
Three-position switch selects either 48-volt or 12-volt phantom power. Center position turns phantom power off.
10. **MIC IN**
Transformer-balanced XLR input accepts microphone level signals.

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Operational Notes

Transformers

The isolation characteristics of transformers are superior to other balancing techniques for the adverse and uncontrolled environments of field production. Transformers provide complete galvanic isolation from the driving source, meaning there is no direct electrical connection. Signals are "transformed" magnetically. Both the transformers in the MP-1 use premium magnetic core material to achieve high signal handling capability (especially at low frequencies) while keeping distortion to a minimum. Because of their inherently high common mode impedance, transformers are unrivaled by any other type of input for common-mode noise rejection.

Both the input and output of the MP-1 can be balanced or unbalanced without any problems. When unbalancing (either input or output) ground pin 3 to pin 1. There is no change in gain with an unbalanced connection into or out of the MP-1.

Phantom Power

Microphones that require phantom power should use the lowest voltage acceptable to maximize battery life. Electret-condenser microphones that can operate on phantom voltages from 11-52 volts will not have any performance benefit using 48-volt phantom; therefore 12-volt phantom is appropriate. Microphones requiring 48-volt phantom will not operate, or may operate with lower headroom and increased distortion, at 12 volts, therefore use 48-volt phantom. Consult your microphone documentation.

Dynamic microphones typically do not require phantom power. A properly connected balanced, dynamic microphone will, typically, not be affected by the presence of phantom power nor will it draw any current. However, it is good practice to turn phantom power off if the microphone cable is suspect. Poor or incorrectly wired microphone cable can cause audible artifacts in the microphone signal. (Phantom is an excellent cable tester.)

High Pass Filter

The two positions of the high pass filter (low cut) in the MP-1 are useful for removing excess low frequency energy in the audio signal. The 80 Hz position is appropriate when recording general speech, music, and ambient sound. The 160 Hz position is useful to enhance speech clarity. The

high pass filter is a single pole design, 6 dB per octave.

When possible, attempt to equalize at the sound source with microphone selection, use of a windscreen, microphone placement, and onboard microphone filtering. A high pass filter on the microphone and a high pass filter on the MP-1 will give an additive effect, increasing the slope of the filter.

Limiter

The MP-1 has a built in peak responding limiter which can be turned on or off by the switch on the front panel. The MP-1 limiter is really two completely separate limiters activated by the one switch; the first limiter keeps the input gain stage from clipping, and the second limiter limits the output to +17 dBu. The two limiters enable the MP-1 to limit in excess of 50 dB, meaning that it is very difficult to clip the unit, no matter the gain setting. The Limiter LED on the front panel illuminates in proportion to the amount of limiting.

Batteries

The MP-1 is designed to operate on two AA alkaline cells for approximately 26 hours with typical signals (without phantom power). The audio performance of the MP-1 does not vary throughout the life of the batteries.

Many factors affect battery life including - battery chemistry, ambient temperature of operation, phantom voltage, microphone current draw, and output drive level. The chart below can be used as a starting point to estimate battery life.

Experimentation is recommended to determine battery life for each individual setup. Note: Nickel-Cadmium batteries are not recommended in the MP-1 since these batteries have lower energy per cell than other types and will result in very short service.

<i>Battery Type</i>	<i>Microphone Type</i>	<i>Battery Life</i>
Duracell AA MN 1500	Dynamic handheld	26 hrs.
Duracell AA MN 1500	Electret condenser, 12-volt phantom	18 hrs.
Duracell AA MN 1500	Studio condenser, 48-volt phantom	5 hrs.

(Test conditions: 70 degrees F, 42 dB of gain with an acoustic music source, 600 ohm load, +4 dBu output)


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FCC Statement

This device has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

CE Conformity Statement

Declaration of Conformity According to ISO/IEC Guide 22	
Manufacturer's Name:	Sound Devices, LLC
Manufacturer's Address:	Sound Devices, LLC 300 Wengel Drive Reedsburg, WI 53959 USA
declares that the product:	MP-1 Professional Microphone Preamplifier
is in conformity with:	
<i>Document No.</i>	<i>Description</i>
EN55103-1 (1997)	Emissions standard for product family audio devices for professional use
EN55103-2 (1997)	Immunity standard for product family audio devices for professional use
EN55022 (1995)/ CISPR 22 (1997)	Radiated and Conducted emissions, Class B
EN61000-4-2 (1995)/ IEC1000-4-2 (1995)	ESD – 6kV contact, 8kV air-discharge
EN61000-4-3 (1995)/ IEC1000-4-3 (1995)	Radiated RF Immunity, 10 V/m, 80% 1 kHz amplitude modulation
EN61000-4-4 (1995)/ IEC1000-4-4 (1995)	EFT/Burst, I/O lines, +/- .25 kV to +/- 1.0 kV
EN61000-4-6 (1996)/ IEC1000-4-6 (1996)	Conducted RF Immunity, 10 V, 80% 1 kHz amplitude modulation
Tested by:	L. S. Compliance, Inc. Cedarburg, Wisconsin
February 3, 1999	
	
Matthew Anderson Director of Engineering	

Warranty

Sound Devices, LLC warrants the MP-1 Microphone Preamplifier against defects in materials and workmanship for a period of ONE (1) year from date of original retail purchase. Sound Devices, LLC will repair or replace the product at its discretion at no charge. Warranty claims due to severe service conditions will be addressed on an individual basis. THE WARRANTY AND REMEDIES SET FORTH ABOVE ARE EXCLUSIVE. SOUND DEVICES, LLC DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. SOUND DEVICES, LLC IS NOT RESPONSIBLE FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING FROM ANY BREACH OF WARRANTY OR UNDER ANY OTHER LEGAL THEORY. Because some jurisdictions do not permit the exclusion or limitations set forth above, they may not apply in all cases.

For all service, including warranty repair, please send the MP-1, along with proof of purchase date to:

Sound Devices, LLC
Service Repair
300 Wengel Drive
Reedsburg, WI 53959 USA

