Model FP24 User Guide
Microphone Mixer

General Description

The Shure FP24 is a studio-quality two-channel, portable, stereo microphone mixer. With assignable L-C-R inputs, built-in slate microphone, 1 kHz tone oscillator, and headphone monitor, the FP24 is extremely flexible. Its impressive audio performance and comprehensive features make it suitable for the front end of any studio or field production system. Radio, television, and film production engineers will especially value its compact size, sunlight-readable LEDs, and rugged mechanical and electrical construction that make it able to withstand extremes in the field.

Features

High Performance Microphone Inputs

- Maximum of 66 dB of gain (each input).
- Premium Lundahl input transformers provide superior audio quality and freedom from interference problems.
- Sealed, conductive plastic potentiometers for long life and reliable gain adjustment.
- Phantom power, selectable between 48 volts and 15 volts.
- Switchable low-cut filters with 80 and 160 Hz corner frequencies, 6 dB per octave. Filters are inserted prior to any active circuitry to maximize headroom.
- Inputs assignable to Left, Center (both left and right) or Right

Audio Performance

- Dynamic range exceeding 110 dB.
- 10 Hz to 50 kHz audio bandwidth.
- Exceptionally low distortion characteristics.
- Discrete, 6-transistor, balanced output drivers provide signal integrity over long cable runs.

Headphone Monitoring

- Switchable between program audio or external (stereo) tape returns.
- High current headphone output has level control and peak indicator.

Level Metering

- Dual-color LEDs indicate clipping and limiter activity for each channel.
- Sunlight-readable, seven segment GaN LED output meters.
- 3-position LED brightness switch (intensity selector).

Audio Limiters

- “Unclippable” input peak limiters with adjustable limiter threshold (each input).
- Dual mono or linked stereo limiter operation.

Flexible Powering

- Internal power from two AA batteries with easy access battery compartment.
- Chassis-isolated 5 to 14 VDC input for easy external DC powering.
- Power LED indicates low battery power.

Trouble-Free Design

- High-strength, extruded aluminum chassis with protective metal end panels withstands punishing field conditions.
- All-metal connectors mount directly to the chassis for durability and RF immunity.
- Free from “Pin 1” grounding problems.
- RF filtering on all inputs and outputs.

27A8727 (Rev. 1)

Printed in U.S.A.

Specifications

Gain:

Mic Input to Output, per channel, continuously variable

Output	*Gain Range*
LINE	–∞ – 66 dB
TAPE	–∞ – 56 dB

Frequency Response:

20 Hz – 30 kHz, +0.2, –0.5 dB; –1 dB at 5 Hz, 50 kHz

(relative to 1 kHz level with 150 ohm source, gain controls set at 50%)

Equivalent Input Noise:

–126 dBu (–128 dBV) minimum

(150 ohm source, flat weighting, 22 Hz – 22 kHz bandwidth, gain control set at 50% or higher, phantom power off)

Input Clipping Level:

–10 dBu minimum

Output Clipping Level:

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

Tape: +11 dBu (2.75 V RMS) minimum with 100k ohm load

Dynamic Range:

110 dB minimum

THD + Noise:

0.05% maximum

(from 50 Hz to 22 kHz @ +4 dBu output level, 22 Hz – 22 kHz filter bandwidth, gain control at 50%, phantom off)

Common Mode Rejection Ratio:

100 dB minimum at 80 Hz

60 dB minimum at 10 kHz

Channel Separation:

Greater than 80 dB at 1 kHz (gain controls set to 50%)

Inputs:

Transformer-balanced, 2k ohm input impedance

Outputs:

XLR: Active, impedance-balanced, 120 ohm output impedance

Tape (3.5 mm ($^1/_8$ in.)): Unbalanced, tip–left, ring–right, sleeve–ground, 2.4k ohm output impedance

High Pass Filters:

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

Phantom Power:

15 V through 680 ohm resistors or 48 V through 6.8k resistors (switch selectable)

Limiter:

Thresholds independently adjustable from +6 dBu to +18 dBu

10:1 limiting ratio

5 ms attack time, 100 ms release time

Amber/Red LED indicates limiting/clipping

Dual mono or stereo linked

Internal Voltage Rails:

+15 V and –15 V, regulated

Metering:

7 segment GaN (Gallium Nitride) meter with 3 intensities

Peak responding

Power:

Internal: 2 AA batteries

External: 5 – 14 VDC via threaded coaxial connector* (5.5 mm outer diameter, 2.1 mm inner diameter); Pin positive, sleeve negative; Voltages above 14 VDC cause no damage to unit, but will open an internal poly fuse that will reset when voltage is removed.

*Threaded coaxial connector provided for use with power supplies not equipped. For instructions on how to solder this connector to a Shure PS20, see Figure 5.

Power LED:

Dual-color LED indicates following:

Green—external DC power or good battery.

Red—less than 1 hour of battery life remaining (with phantom power off).

Polarity:

All inputs to all outputs, non-inverting.
Pin 2 of XLRs “hot” (to unbalanced inputs and outputs).

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 (FP24 only):

0.8 kg (1.8 lbs.)

Weight (packaged):

1.2 kg (2.6 lbs.)

EMC Certifications:

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

Optional Accesories

Balanced line-level-to-microphone-level in-line adapter A15LA

FP33/FP24 Interconnection Kit A33LK

Inline Polarity Inverter A15PRS

Front Panel Controls, Connectors, and Indicators

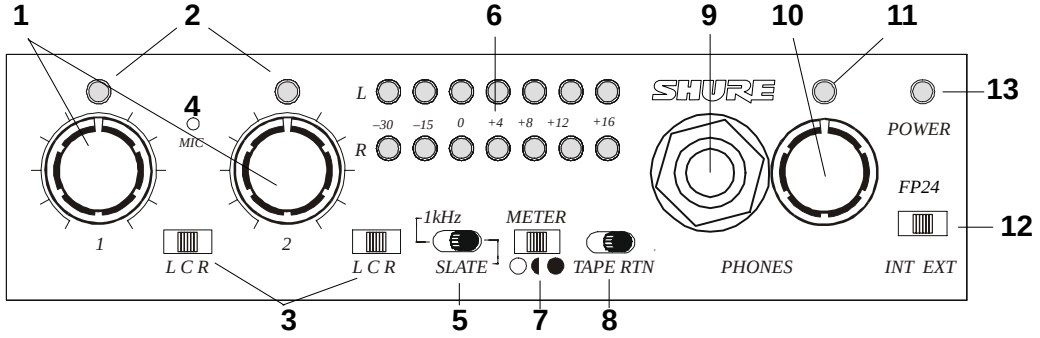

Figure 1. Front Panel

1. **Input Gain Controls**
   Sealed, conductive plastic rotary potentiometers.
2. **Input Peak/Limiter LEDs**
   Dual-color LED illuminates red at 3 dB below clipping; illuminates amber to indicate limiter activity.
3. **L-C-R Switches (Input Assignment)**
   Three-position switch assigns inputs to Left, Center (both left and right) or Right outputs.
4. **Slate Microphone**
   Condenser microphone with AGC activated by momentary Slate Microphone Switches. Slate Microphone output appears at all outputs.
5. **Tone Oscillator/Slate Microphone Switch**
   Toggle switch activates 1 kHz tone oscillator when switched to the left position and activates the slate microphone when momentarily moved to the right position. Microphone inputs are muted when Tone Oscillator or Slate Microphone are activated.
6. **Output Meters**
   Indicates peak output level in dBu.
7. **Meter Brightness Control**
   Three-position switch adjusts the intensity of illumination of the output meter; low illumination, normal illumination, or super-bright illumination.
8. **Tape Return Switch**
   Toggle switch allows external audio to be monitored in the headphones. The center position is FP24 program audio. The left and right positions monitor tape return audio; the left position is locking, and the right position is momentary.
9. **Headphone Connector**
   For stereo and mono headphones with ¼" connectors.
10. **Headphone Volume Control**
11. **Headphone Peak LED**
    Illuminates 3 dB before clipping of either channel of the headphone circuit and either channel of Tape Return audio.
12. **Power Switch**
    Three-position switch selects the power source. The unit is powered from internal batteries when in the left position; powered from external DC source when in the right position. Center position is off.
13. **Power LED**
    Two-color LED illuminates green when the unit is powered and changes to red when batteries require changing. For external DC, the power LED is always green.

Input Panel Connectors and Controls

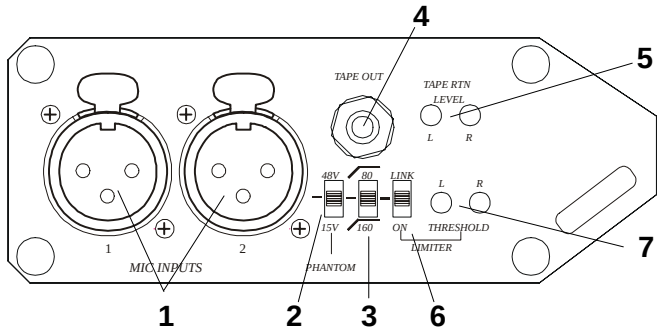

Figure 2. Side Input Panel

1. **Mic Inputs**
   Transformer-balanced XLR inputs accept microphone level signals. Pin 2 = hot, Pin 3 = cold, Pin 1 = ground.

   NOTE: You can use Shure A15LA line adapters to connect balanced, line-level sources to these inputs.
2. **Phantom Power**
   Three-position switch selects either 48-Volt or 15-Volt phantom power for both inputs. Center position turns phantom power off.
3. **High Pass Filter Switch**
   Three-position switch selects 80 Hz or 160 Hz corner frequency filters, 6 dB per octave. Filters affect both inputs. Center position of switch removes filters from the signal path.
4. **Tape Output**
   3.5 mm ($^1/_8$ in.) TRS stereo output (unbalanced) can be used to feed consumer level DAT, MiniDisc, and CD recorders. Tip = Left, Ring = Right, Sleeve = Ground.
5. **Tape Return Level Control**
   Recessed potentiometers adjust Tape Return level feeding the Headphone Monitor.
6. **Limiter Switch**
   Activates input peak limiter. ON position functions as a dual mono limiter, with each input signal controlling its own limiter. LINK functions as a stereo limiter, with both left and right inputs controlled simultaneously. Center position of switch turns limiters off.
7. **Limiter Threshold Level Control**
   Recessed potentiometers adjust peak level of limiter activation. Can be independently controlled for each input.

Output Panel Connectors

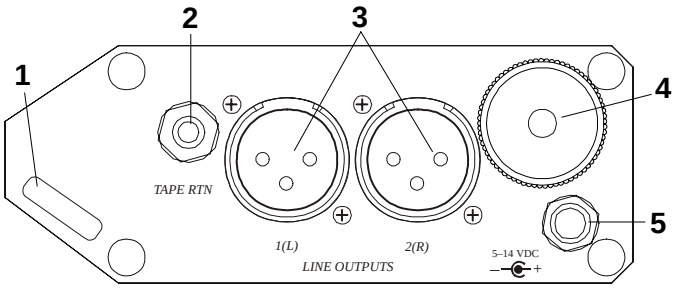

Figure 3. Side Output Panel

1. **Strap Slot**
   Attachment point for camera straps.
2. **Tape Return Input Connector**
   3.5 mm ($^1/_8$ in.) TRS stereo (unbalanced) input for headphone monitoring of external audio sources.
   Tip = left, ring = right, sleeve = ground.
3. **Left and Right Line Level Outputs**
   Active-balanced XLR line-level outputs. +22 dBu peak output level. Pin 2 = hot, pin 3 = cold, pin 1 = ground. Pin 3 can be grounded or ungrounded to drive unbalanced inputs.
4. **Battery Compartment**
   Houses two AA batteries. Insert positive (+) end of batteries first.
5. **External DC Power Input**
   Accepts 5–14 VDC from an AC to DC transformer or a battery supply. Locking, threaded coaxial connector.
   Center pin = positive, sleeve = negative. Use the supplied threaded connector for power supplies with plug-type connectors (such as the Shure PS20). See Figure 5 for wiring diagram.

Operational Notes

Input Transformers

The FP24 uses premium Lundahl input transformers with premium magnetic core material to achieve high signal-handling capability, flat frequency response and minimum distortion. Because these transformers provide galvanic isolation from the driving source, they offer superior isolation from the adverse and uncontrolled environments of field-production. Their high common-mode impedance also provides exceptional common-mode rejection.

Output Circuitry and Tape Output

Each line level XLR output of the FP24 uses a discrete, six-transistor, “impedance balanced” output stage. The circuit uses oversized, high speed transistors to achieve low distortion, robust line driving capability. Pin 2 is driven with signal, and pin 3 is not. (A common misunderstanding is that a “balanced” output refers to equal and opposite signals on pins 2 and 3. Correctly, “ impedance balanced” refers to equal *impedances* from pins 2 and 3 to ground, not equal signal voltages.) To drive unbalanced inputs, pin 3 can be grounded or left unconnected. There is no change in signal level driving balanced or unbalanced inputs.

The FP24’s tape output feeds consumer-level devices, such as computer sound cards, DAT or MiniDisc recorders, and cassette recorders. A cable wired with 3.5 mm ($^1/_8$ in.) TRS to 3.5 mm ($^1/_8$ in.) TRS or 3.5 mm ($^1/_8$ in.) TRS to Left/Right phono (RCA) connectors will connect the FP24 to such devices.

Using the FP24 as a Mixer

The FP24 can be used as a simple two-channel mixer. Possible applications include:

- Quickly reversing the stereo image of a recording without reconnecting inputs or outputs.
- During set up, checking for mono compatibility by assigning both inputs to the same output.
- Recording dialog in mono.
- Performing “mix minus” by routing Input 1 to Center and Input 2 to Right. A summed mono signal of both inputs appears at the Right output while only Input 1 appears at the Left output. This is useful for post production processing of Input 1 audio.

Phantom Power

Use one of the two phantom power settings on the FP24 for microphones that require it. Some microphones need the 48-Volt setting to avoid a loss of headroom and increased distortion. The 15-Volt setting, however, lengthens battery life, and electret-condenser microphones rated for operation at 15 V or less generally receive no performance benefit from the 48-Volt setting. Consult your microphone documentation for phantom power requirements.

Dynamic microphones do not require phantom power. A properly connected balanced, dynamic microphone is not affected by the presence of phantom power and does not draw any current. However, poorly or incorrectly wired microphone cable can cause audible artifacts in the microphone signal (phantom power can be an excellent cable tester). It is good practice to turn phantom power off when not needed.

High Pass Filter

To remove excess low-frequency energy in the audio signal, use either of the two high pass (low cut) filter settings on the FP24. Use the 80 Hz position for most applications, such as recording speech, music, and ambient sound. The 160 Hz position is useful for enhancing speech clarity and reducing wind-noise. The high pass filter is a single pole design, 6 dB per octave.

When possible, equalize at the sound source by microphone selection, placement, use of a windscreen, and onboard microphone filtering. Using both the high pass filter on the FP24 and the one on a microphone has an additive effect, increasing the overall slope of the roll-off.

Headphone Monitoring and Tape Return

The three position Tape Return switch on the front panel selects the audio source being monitored:

Center Position—Program audio (normal operation). Monitors the Left and Right outputs of the FP24.

Left and Right Positions—Secondary audio source. Monitors audio from the Tape Return input of the FP24. Can be used to verify that signal is reaching cameras and tape machines. Left is locking; right is momentary.

Important: The FP24 can drive headphones to very high levels. Exercise care when monitoring. Reduce the level when the Headphone Peak LED illuminates.

Limiters

The FP24 has two built-in peak-responding limiters, one for each input channel. Each limiter has a two-stage circuit: the first stage keeps the input gain stage from clipping; the second stage limits the variable gain stage according to the Limiter Threshold control setting. This unique, two-stage topology limits the gain stage directly after the mic input transformer without changing the input impedance as other "at the mic" limiters do. The circuit enables the FP24 to limit in excess of 50 dB, making it very difficult to clip the unit regardless of the gain setting.

The FP24's limiters can operate in either either dual-mono or stereo. Use the three-position switch on the input panel to set the limiting mode:

- In the middle position, the limiters are turned off.
- In dual mono operation (**ON** switch position), the limiters work independently, responding only to their input signals.
- In stereo-linked operation (**LINK** switch position), the limiters control both channels identically. This maintains a stable stereo image.

When the limiters activate, the Peak/Limiter LED on the front panel illuminates amber in proportion to the amount of limiting for each channel.

Tone Oscillator and Slate Microphone

The switch labeled 1 kHz/SLATE on the front panel controls two functions. The **1 kHz** position (**left**) mutes all inputs and sends a 1 kHz sine wave calibration tone at +4 dBu to all outputs. The tone oscillator can be used to verify connections and set nominal levels on recording and transmission equipment.

The **SLATE** position (**right**) is a momentary switch position that activates the built-in slate microphone located behind the front panel. When the switch is held to the right, all inputs are muted and slate mic signal is sent to all outputs. The slate mic circuit contains an AGC (automatic gain control) to keep the slate level relatively constant regardless of the acoustic level. Use the slate microphone to document takes right at the mixer location when microphones are on talent or away from the production mixer.

Metering and Clip-Indicators

Three two-color clip-indicators monitor signal levels throughout the FP24:

1. Above each input gain control, a two-color LED glows red 3 dB below clipping. This clip circuit monitors both the front end gain stage and the variable gain stage.
2. A headphone-clip LED, located above the headphone level control, indicates when either channel of the headphone circuit approaches clipping.
3. The headphone-clip LED also indicates when either channel of the tape return audio is near clipping.

When the limiter is activated, these input LEDs glow amber in proportion to the amount of limiting.

The FP24 has a seven segment LED output meter that shows peak output level in dBu. From left to right, the first three LEDs are separated by 15 dB and the remaining LEDs are separated by 4 dB. This calibration provides a 46 dB-dynamic range with good resolution in the critical signal level range.

The meter uses premium Gallium Nitride (GaN) LEDs which are visible even in direct sunlight. A three-position switch on the front panel controls the brightness of the output meter. Choose low, normal, or super-bright.

CAUTION – When set to super-bright intensity, the LEDs in the output meter can irritate or damage eyes with prolonged direct exposure.

Power Sources and Battery-Life

The FP24 operates from either two internal AA alkaline cells or an external 5–14 VDC battery supply or AC to DC transformer (such as the Shure PS20). The power connector is a locking, threaded coaxial connector. Center pin = positive, sleeve = negative. Use the supplied threaded power connector if necessary (see Figure 5).

The external DC input supply is galvanically isolated (floating) from the chassis and the rest of the circuitry. The isolation provides trouble-free interconnection to other pieces of equipment sharing the same DC power source. The center pin of the locking DC connector is positive, and the sleeve is negative. Since the external DC supply is floating, the positive or the negative can be connected to the chassis with no adverse effects.

Two AA, 1.5 Volt lithium cells can power the FP24 for up to approximately 11 hours. However, several factors affect how long a given pair of batteries will last. These factors include battery chemistry, ambient temperature, use of phantom power, output meter brightness, and the output drive level of the FP24. The chart below provides estimates of battery life in different kinds of circumstances. Experimentation can determine expected battery life for specific setups and environments.

NOTE: AA carbon cells and AA nickel-cadmium cells are not recommended for use in the FP24 since they have lower power capacity than other types and will result in very short service life.

Battery Type	***Microphone Type and FP24 Settings***	***Battery Life***
Eveready AA No. L91 (lithium)	2 dynamic handheld microphones, low meter brightness, no headphones	11 hrs.
Duracell AA MN 1500 (alkaline)	2 dynamic handheld microphones, low meter, low headphone level	6 hrs.
	2 condenser, 15-Volt phantom powered microphones, normal meter intensity, normal headphone level	4 hrs.
	2 studio condenser, 48-Volt phantom powered microphones, super bright meter intensity, high headphone level	2 hrs.
Test conditions: 70 degrees F, 42 dB of gain with an acoustic music source, 600 ohm load, +4 dBu output		

Interconnecting the FP24 and FP33

You can connect the balanced, line level XLR outputs of the FP24 to the mix bus of the FP33 using the Shure A33LK accessory kit (or construct a cable assembly as shown in Figure 4 on the following page).

Combining an FP24 and a Shure FP33 (or FP32A) mixer yields a flexible, cost-effective, 5 X 2 field mixing setup with the following features:

- Simultaneously accepts a stereo microphone, hard-wired shotgun, and two RF lavalier microphones.
- 48-volt phantom power for all five microphone inputs
- Limiters on the FP24 inputs
- Input assignment switches on the FP24 and pan pots on the FP33 inputs
- Two output buses—assignable to mic or line level output.
- Master volume and headphone monitoring for all five inputs controlled from the FP33.
- Compact—FP24 adds little bulk to an existing FP33 package.
- The FP24's isolated external DC input jack eliminates ground related interference problems.

NOTE: When interconnecting the FP24 and FP33, inputs from the FP24 appear at the FP33 mixbus with their polarity reversed. (This is unavoidable due to the nature of the interconnection.) To avoid cancellation or interference effects (e.g., comb filtering) between the signals from the FP24 and FP33 inputs, use Shure A15PRS polarity inverters on the FP24 inputs, or do one of the following:

- Keep microphones connected to the FP24 as far away as possible from those connected to the FP33.
- For microphones that must be close together (such as those in a stereo pair), connect them to the same mixer.

NOTE: If constructing your own FP24/FP33 interconnect cable:

- Keep cable length to a minimum, since the interconnection is unbalanced.
- Be sure to drive the FP33 mix bus off of pin 2 of the FP24 since the FP24 inputs are reverse polarity with respect to FP33 inputs.

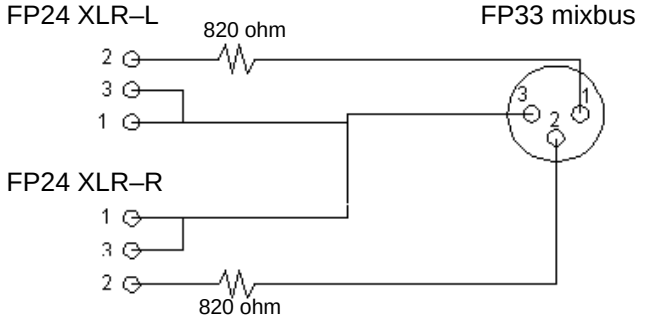

Figure 4. FP24/FP33 Mix Bus Interconnect Cable

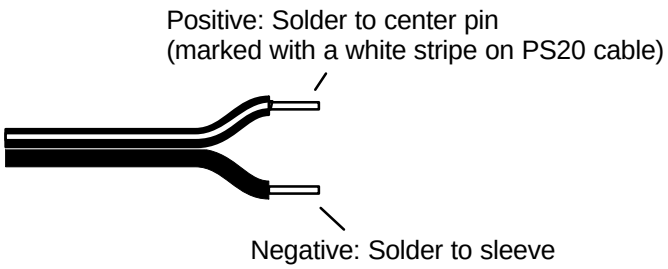

Figure 5. Attaching the Supplied Threaded Power Connector.

Certification

Authorized under the DECLARATION OF CONFORMITY provision of FCC part 15 as a Class B digital device. Tested to comply with FCC standards. FOR HOME OR OFFICE USE. This product complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Changes or modifications not expressly approved by Shure Incorporated could void your authority to operate this equipment.

This equipment 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. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and the receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

This class B digital apparatus complies with Canadian ICES–003.

Eligible to bear CE marking.

Conforms to European EMC directive 89/336/EEC: Professional Audio Products Standard EN 55103 (1996); Part 1 (emissions) and Part 2 (immunity). The FP24 is intended for use in environments E1 (residential) and E2 (light industrial) as defined in European EMC standard EN 55103. It meets the applicable tests and performance criteria found in the standard for these environments. EMC conformance is based on the use of shielded interconnecting cables.

N 108

Limited Two-year Warranty

Shure Incorporated ("Shure") hereby warrants that this product will be free from defects in materials and workmanship for a period of two years from date of purchase. At its option Shure will repair or replace the defective product and promptly return it to you, or refund the purchase price. You should retain proof of purchase to validate the purchase date and return it with any warranty claim.

If you believe this product is defective within the warranty period, carefully repack the unit, insure it, and return it postage prepaid to:

Shure Incorporated
Attention: Service Department
5800 W. Touhy Avenue
Evanston, Illinois 60714–4608 U.S.A.

Outside the United States, return the product to your dealer or Authorized Service Center.

This warranty does not apply in cases of abuse or misuse of the product, use contrary to Shure's instruction, or unauthorized repair. All implied WARRANTIES OF MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE are hereby disclaimed and Shure hereby disclaims liability for incidental, special, or consequential damages resulting from the use or unavailability of this product.

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FCC Declaration of Conformity

We of

Shure Incorporated
5800 W. Touhy Avenue
Evanston IL 60714–4608 U.S.A.
847–600–2000

declare under our sole responsibility that the following product,

Model: FP24 Name: FP24 Microphone mixer/preamplifier

was tested and found to comply with Part 15 of the FCC rules.

Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Testing was completed by the following NVLAP or A2LA accredited laboratory:

L.S. Compliance, Inc.
W66 N220 Commerce Court
Cedarburg, Wisconsin 53012
Telephone 262–375–4400
Fax 262–375–4248

Shure Incorporated, Manufacturer.

Signed: Date: Sept. 15, 2000

Name, Title: Craig Kozokar, Project Engineer, EMC

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SOUND DEVICES

MixPre-D

User Guide and Technical Information

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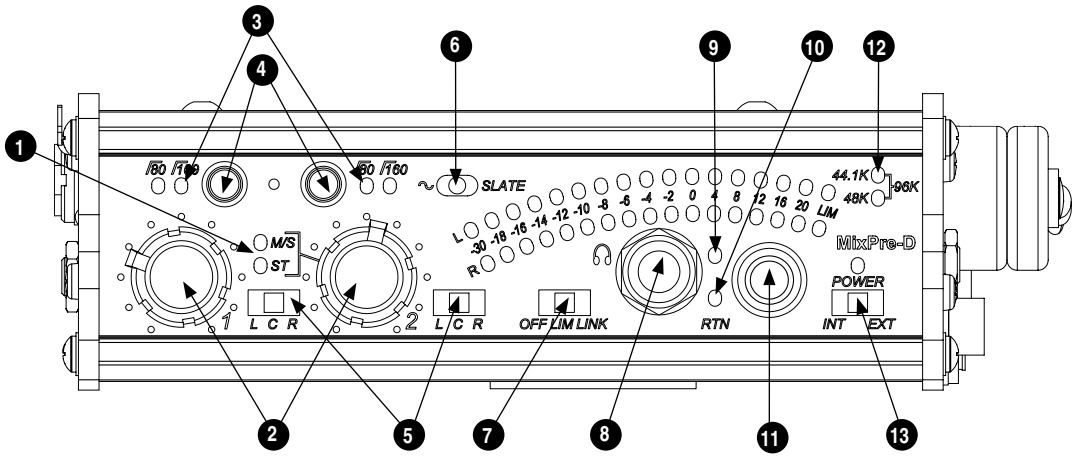
Front Panel Description



1) **Link LEDs**
Indicates linked status of inputs. **Both LEDs off:** no link; **Bottom LED illuminated:** stereo linking; **Both LEDs illuminated:** MS stereo linking. *See Input Linking*

2) **Input Gain Controls**
Potentiometers to adjust input gain. Fully counter-clockwise is off.

3) **High-Pass Filter LEDs**
Indicates that the high-pass filter is engaged for the input. **One LED illuminated:** 80 Hz; **Both LEDs illuminated:** 160 Hz.

4) **Input Buttons**
Toggles between high-pass filter settings for the input (Off / 80 Hz / 160 Hz).

5) **Pan Switches (Input Assignment)**
Three-position switch pans input to Left, Center (both left and right) or Right outputs. When inputs are linked, Input 2 Pan Switch function is altered. *See Input Linking*

6) **Tone Oscillator/Slate Microphone Switch**
Toggle switch activates a 1 kHz tone oscillator when switched to the left position and activates the slate microphone when in the right (momentary) position. Microphone inputs are muted when tone or slate are activated.

7) **Limiter Switch**
Activates both the input and output limiters. **Middle:** (LIM) dual-mono limiter operation; **Right:** (LINK) stereo operation. Threshold is adjustable. *See Front Panel Shortcuts*

8) **Headphone Connector**
Accepts stereo and mono headphones with 1/4-inch connectors.

9) **Return Signal LED**
Indicates presence of signal on RTN input or Channel 3 & 4 input. *See Inputs 3 and 4*

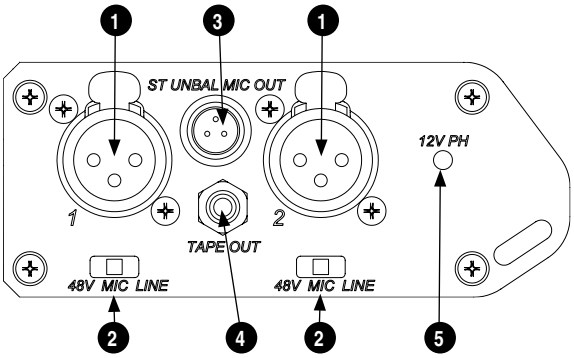
10) **Monitor Source LED**
Indicates monitor source. **Off:** output bus. **Solid:** Return signal; **Flashing:** USB output signal. *See Computer Interface*

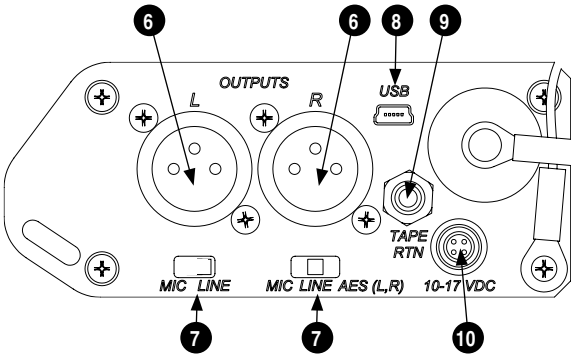
11) **Headphone Controller**
Rotating controls headphone gain. Push to cycle between monitor sources. Also controls various secondary functions. *See Front Panel Shortcuts*

12) **Sample Rate LEDs**
Indicates the current sample rate when AES output is active or USB is connected.

13) **Power Switch and LED**
Three position switch: **Middle:** off; **Left:** (INT) internal power; **Right:** (EXT) external power. Power illuminates green for adequate voltage and flashes green when voltage is low.

Side Panels Description





1) **XLR Inputs**
Transformer balanced input stage. Pin 1: ground; Pin 2: 'hot' (+); Pin 3: 'cold' (-). Can be unbalanced by grounding pin 3 to pin 1 of the XLR connector.

2) **Mic/Line and Phantom Power Switch**
Selects the input level of the adjacent XLR input. **Left:** (48V) mic level with phantom power; **Middle:** (MIC) mic level without phantom power; **Right:** (LINE) line level. Mic level has 40 dB more gain than line level.

3) **Stereo Mic-level Output**
Unbalanced stereo signal on a TA3 connector. Signal from this output is mic level (-36 dBu). Pin 1: ground; Pin 2: left; Pin 3: right.

4) **Stereo Line-level Output (Tape Out)**
Unbalanced, stereo, 3.5 mm output connector. Signal from this output is aux level (-10 dBu). Tip: left; Ring: right; Sleeve: ground.

5) **12V Phantom LED**
Illuminated: phantom power is set to 12 V; **Off:** phantom power is set to 48 V.

6) **XLR Outputs**
Active-balanced outputs. Mic or Line switchable. Right output can also be set to AES. Pin 1: ground; Pin 2: 'hot' (+); Pin 3: 'cold' (-).

7) **XLR Output Switch**
Sets level of output XLRs. **Left:** (MIC) mic level (-40 dB); **Middle:** (LINE) line level; **Right:** (AES) AES digital. The AES setting is available on the right output only. AES signal carries 2 channels on one balanced connector.

8) **USB Port**
USB connector for interconnection with the computer. USB 1.1 and 2.0 compliant.

9) **Return Input**
Unbalanced, stereo, 3.5 mm input connector. Feeds return signal to monitors or 3,4 Inputs. *See Inputs 3 and 4*. Tip: left; Ring: right; Sleeve: ground.

10) **DC Input**
Accepts input voltage from 10 to 17 V for mixer powering. Pin 1: negative (-); Pin 4: positive (+). External DC is isolated (floating) from the rest of the circuitry.

Inputs

The MixPre-D features two transformer balanced analog inputs. Each input provides enough gain to amplify a variety of signals from low-sensitivity ribbon and dynamic microphones, medium-level wireless and condenser microphones, and "hot" line level signals.

The XLR inputs of the MixPre-D are transformer-balanced. The isolation characteristics of transformers are superior to other balancing techniques and are ideal for the hostile and uncontrolled environments of field production. Transformers provide galvanic isolation from the driving source, meaning there is no direct electrical connection. Signals are "transformed" magnetically. The input transformers in the MixPre-D 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.

The inputs of the MixPre-D can be used as balanced or unbalanced. When unbalancing, ground pin-3 to pin-1 of the XLR connector. There is no change in gain between unbalanced and balanced connections into the MixPre-D.

Mic / Line Setting

Before plugging a source into an XLR input on the MixPre-D, set the Mic/Line and phantom powering switch to the correct position:

Setting	Input Source
48V	Condenser microphones requiring phantom power
MIC	Dynamic microphones, some ribbon microphones, devices outputting mic-level signal (for example, wireless receivers).
LINE	Devices outputting line-level signal (outputs from other mixers, for example)

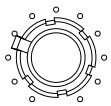
Phantom Power

Phantom powering is a fixed DC voltage at either 12 or 48 volts. This voltage is resistively applied to pin-2 and pin-3 of an XLR connector relative to pin-1. There is no voltage difference between the signal pins-2 and -3. Dynamic microphones will operate as normal when phantom power is applied to them.

The MixPre-D can provide up to 10 mA to each input at 48 V, sufficient for the most power-hungry condenser microphones. Many phantom powered microphones do not require 48 V and can be properly powered with 12 V. When acceptable, use 12 V phantom to extend the MixPre-D's battery life. The phantom voltage level can be set to either 12 V or 48 V and is applied across all inputs where phantom power is selected.

To change the phantom voltage between 12 V and 48 V, hold down the Headphone Controller and slide the Slate switch into the slate position. The 12 V Phantom LED on the left side panel illuminates green when the phantom voltage is set to 12 V.

Input Gain Control



The amount of gain applied to an input is adjusted with the Input Gain Control. A fully clockwise position results in no signal passing from the input to the output bus (muted). Up to 66 dB of gain is available from for microphone inputs.

High-pass Filter

Each input of the MixPre-D has a two-position high-pass filter. High-pass (or low-cut/low frequency roll-off) filters are useful for removing excess low frequency energy in audio signals. Wind noise is a common unwanted low frequency signal and a high-pass filter is effective for reducing wind noise. For most audio applications engaging the high-pass filter is beneficial, since little usable audio information exists below 80 Hz, especially for speech reproduction.

The MixPre-D's high-pass filters feature a 6 dB/octave slope with either 80 Hz or 160 Hz corner (-3 dB) frequencies. The 160 Hz setting is used when aggressive filtering is required. The MixPre-D's high-pass circuit is unique because of its placement before any electronic amplification. Most mixer's high-pass circuits are placed after the mic preamp, where all of the high-energy low-frequency signals get amplified. Because the MixPre-D's circuit cuts low-frequency signals before amplifying, higher headroom is achieved in presence of signals with a high amount of low-frequency energy.

When possible, attempt to equalize at the sound source with microphone selection, use of windscreens, microphone placement, and on-board microphone filtering. Many microphones have on-board high pass filters, and the high-pass filters on the MixPre-D can be used in conjunction with the microphone's filters to increase the filter's slope.

The three available high-pass filter settings are switched for each input by pressing the Input Button for the adjacent input. The two blue High-pass Filter LEDs for each input indicate the setting of the high-pass filter for the adjacent input.

Limiters

The MixPre-D Limiters act solely as "safety" limiters. Activate the Limiters using the front panel "LIM" switch. Both input and output limiters are active, with input limiters preventing overload of the input stage and output limiters preventing the MixPre-D from overloading the next device in the signal chain.

In normal operation, with a properly set gain structure, the limiter threshold is only occasionally reached. In the presence of extremely high input signal levels, such as in high SPL environments, the limiter(s) activate to prevent the input signal from clipping. The limiters have no effect on audio below the set threshold.

When Inputs 1 and 2 are linked as a stereo pair, the limiters also link; gain reduction is equal for both inputs.

To change the threshold of the limiters, hold down both the Input 1 Button and the Input 2 Button and turn the Headphone Controller.

Pan Switch

The pan switches assign inputs to the channels of the output bus. Inputs can be sent to the left, right, or both outputs equally. The MixPre-D features excellent "off-attenuation" in the left and right positions. With the use of the pan switches, separate mixes can be sent to the left and right outputs. For example, a summed mono mix of both inputs can be sent to the right output while a single input can be sent to the left output.

Inputs 3 and 4

Each channel of the Tape Return input can be routed to various locations. When additional inputs are needed (such as when multiple wireless receivers are used) the Tape Return channels can be independently routed to the main output bus of the MixPre-D to act as additional inputs (3 and 4).

To cycle between the available routings of the Tape Return signal, hold down the Input 1 Button (for Channel 3) or the Input 2 Button (for Channel 4) and press the Headphone Controller. An LED in the right meter will illuminate to represent the destination of the routing:

- -30: RTN L (Channel 3) or RTN R (Channel 4)
- -18: Left output bus.
- -16: Center (left and right) output bus
- -14: Right output bus

When any channel of the Tape Return input is routed to the main output bus, the RTN Monitor Source is disabled.

The TAPE RTN (Input 3 and 4) Input is an unbalanced stereo input that is suitable for tape or line level devices only. There are no microphone preamps on Inputs 3 and 4.

Input Linking

Stereo linking allows Inputs 1 and 2 to be controlled as a single, stereo input. This is useful when stereo microphones or stereo line level signals are used with the MixPre-D. There are two modes of operation for stereo linking, X/Y link and MS stereo.

The Linked status of the inputs is indicated by the Link LEDs on the front panel. When both LEDs are off, the inputs are not linked. To cycle between linking configurations hold down both Input 1 and Input 2 Buttons and slide the Slate Switch to the Slate position.

X/Y Stereo Link

When in X/Y stereo link operation, Input 2's Pan Switch controls the stereo image (**L:** Input 1 = Left, Input 2 = Right; **C:** Both Inputs in both channels; **R:** Input 1 = Right, Input 2 = Left). Channel 2's Fader controls the overall level of the stereo pair. Input 1 and 2's High-pass Filters continue to act independently of each other. When linked, Input 1 and 2's Limiters are also linked.

MS Stereo Linking

When MS stereo linking is selected in the Setup Menu, Inputs 1 and 2 are linked as an MS (Mid-Side) stereo pair. Connect the mid signal (unidirectional / cardioid microphone) to Input 1 and the side signal (bi-directional microphone) to input 2.

Input 2's Level Control adjusts the overall gain of the MS stereo pair. Input 1's Level Control adjusts the "spread", or width of the stereo image. Input 2's Pan Switch controls the polarity of the side signal (**L:** Normal, **R:** Inverted). Reverse polarity to flip the stereo image between right and left. The center ("C") position of Input 2's Pan Switch mutes the side signal; only the mid signal is present, resulting in a mono signal. Input 1's Pan Switch is disabled in MS linking mode. Input 1 and 2's High-pass Filters continue to act independently of each other.

Outputs

The MixPre-D is a two-output-bus mixer. Each input can be "hard panned" between the left and right output bus making it easy to use the MixPre-D in either stereo or dual-mono operations. Because dialog is often recorded in mono, each output connector can be used to send signal to separate cameras or recorders. The MixPre-D's XLR Outputs, Tape Outputs, Stereo Unbalanced Mic Outputs, and AES Digital Output share the same program content and pan assignment.

There is no master level control on the MixPre-D. The master is factory-set to unity gain, or "0" dB.

XLR Outputs

The two XLR outputs are active-balanced connections, each capable of driving long lines. These connections can be used as either balanced or unbalanced. When unbalancing, use pin-2 for (+) and pin-1 for ground; float (leave open) pin-3.

Tape Output

The Tape Output is typically used to interface with consumer inputs such as Comtek inputs or consumer transcription recorders. The MixPre-D has an unbalanced, two-channel tape level output on a single, TRS 3.5 mm connector.

The Tape Output program is identical to the XLR Output. Tape Out level is fixed at a -10 dBu nominal level and is electrically isolated from the XLR Outputs. Additionally, the Tape Output is used for the Mix Out signal to link multiple Sound Devices mixers.

AES Digital Output

The Right XLR Output can be set to AES digital signal by sliding the XLR Output switch to "AES". In this configuration, the Right XLR Output contains both channels of the MixPre-D's output as a balanced, AES3 signal. All other outputs are unaffected, so inputs panned left will appear on the left channel of the AES output plus the left channel of all analog outputs (including the left XLR main output).

Sampling Rate

The MixPre-D's digital system operates at sample rates of 44.1 kHz, 48 kHz, or 96 kHz. When either a USB connection or AES output is enabled the operating sample rate of the MixPre-D is indicated by the front panel Sample Rate LEDs. If AES output is disabled and there is no USB connection to a computer both Sample Rate LEDs are off.

To change the sampling rate of the MixPre-D, hold down the Headphone Controller while sliding the Right XLR Output switch to "AES".

When connected to a computer with a USB cable, the sample rate of the MixPre-D is set by the computer's operating system and the sample rate cannot be changed from the MixPre-D. *See Computer Interface*

Stereo Unbalanced Mic Output

The Stereo Unbalanced Mic Output is designed to interface with "pro-sumer" DSLR-type cameras. The MixPre-D has an unbalanced, two-channel "hot" mic level output on a single, locking, TA3M connector.

The Stereo Unbalanced Mic Output program is identical to the XLR Output. This output is fixed at a -36 dBu.

Monitoring

Headphone Gain

Headphone output level is controlled by the front panel Headphone Controller. While turning the Headphone Controller, the headphone gain level is indicated on the Right Output Meter.

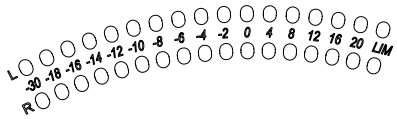
The MixPre-D can drive headphones to dangerously high levels. Turn down the headphone gain before selecting a headphone source to prevent accidental signal extremes.

Headphone Source Selection

The source of the headphone output can be selected by pressing the Headphone Controller. The Headphone Source LED indicates what source program is present in the headphone output.

Headphone Source LED	Headphone Source
Off	Main mixer output (Including Channel 3/4 input, if enabled)
Solid Blue	Return signal
Flashing Blue	Computer Audio (Only available in Interface Mode)

Metering



The MixPre-D features two large 16-segment LED output meters. The meters use energy-efficient GaN LEDs, which are clearly visible in full sunlight. The MixPre-D output meters are unaffected by shock, temperature, or humidity extremes.

The MixPre-D meters display input levels in a peak + VU format. The perceived loudness (VU) is displayed on a bar graph, and the Peak signal on a dot above the VU. This metering format provides the best of both VU and Peak metering by seeing the "loudness" of the signal while simultaneously showing peaks.

To adjust the brightness of the meters (and other front panel LEDs) slide and hold the Slate Switch in the Slate position and turn the Headphone Controller.

Tone Oscillator & Slate Microphone

A single, two-position switch controls both the slate microphone and the tone oscillator.

Slate Microphone

The built-in MixPre-D slate microphone is used to notate scenes from the mixer location. Its audio performance is not suitable for critical recording applications; it should be used for documenting scenes and for communication purposes only.

The slate mic uses the momentary right switch position. Hold the switch to the right to activate, and release to turn off. Program audio is muted when the slate mic is active. The slate is sent to all outputs.

Tone Oscillator

Tone is used to set gain between the MixPre-D and the next device in the signal path. The tone oscillator uses the locking left position of the slide switch. Slide left to activate, and slide right to deactivate.

The tone oscillator outputs a 1 kHz sine wave at 0 dBu to the outputs (when the outputs are set to Line Level). Program audio is muted when tone is active. Tone is sent to all outputs. The MixPre-D headphone outputs are attenuated when tone is activated.

Powering

The MixPre-D can be powered from either internal batteries or from external DC. The power-efficient MixPre-D can operate from two AA alkaline batteries for nearly a production day (less with phantom powering). While many users prefer external DC sources to power both their mixer and wireless receivers, the use of internal batteries is perfectly feasible for both primary and backup powering of the MixPre-D.

Power Switch and LED

The 3-position power switch selects between internal batteries, external DC, or power off. There is sufficient capacitance in the power supply circuit to toggle between internal and external without any disruption in audio.

The power LED illuminates solid green to indicate good power. The power LED flashes green when the internal batteries are low.

Internal Batteries

The MixPre-D accepts two standard AA batteries (1.2 to 1.65 Volts). The robust battery cap and tube are sealed to prevent inadvertent battery leakage from reaching internal circuitry. The threaded-nickel cap extends beyond the panel to make battery changes easy and quick.

Remove batteries when the unit is stored for extended periods.

External DC Sources

For extended mixer runtime use an external DC source. The MixPre-D can be powered from any DC source with a voltage range of 10 volts to 18 volts. If an over voltage is applied to the mixer, an internal poly fuse is opened to prevent mixer damage. The fuse is reset when the voltage is removed.

The external DC supply is isolated (floating) from the circuitry to minimize ground loop and interaction among devices sharing the same DC source. The external DC connector is a Hirose 4-pin female. This locking connector mates to Hirose P/N HR10-7P-4P (Sound Devices P/N XL-H). Pin-1 is negative and pin-4 is the positive voltage.

Computer Interface

The MixPre-D is an USB Audio Device Class peripheral. When attached to a computer as an audio interface, the stereo output bus is sent to the computer as left and right inputs and the left/right audio output of the computer is sent to the headphone output of the MixPre-D.

No proprietary drivers are required to operate the MixPre-D. The MixPre-D directly operates with Mac OS 10.4+, Windows XP, Vista, and 7 (both 32- and 64-bit), or Linux (*See Computer System Requirements* for details). The first time the MixPre-D is plugged in, the operating system will enable standard USB Audio Device Class drivers automatically (if necessary).

When connecting the MixPre-D to computers running Linux or any version of Macintosh OS X previous to 10.5.8, it is necessary to run the MixPre-D in "full-speed" USB mode. To do this, hold down the Headphone Controller while inserting the USB plug to the MixPre-D.

Installation and Connection with Mac OS

Before connecting the MixPre-D, quit all open applications which use audio. Audio application that are open when the MixPre-D is connected may not recognize the MixPre-D until the application is restarted.

OS X Audio / MIDI Setup

1. Follow ***Applications> Utilities> Audio MIDI Setup*** to open the ***Audio MIDI Setup*** dialog.
2. OS X 10.6 and later: Highlight the MixPre-D item in the list of devices, click the button with the gear icon and select ***Use this device for sound output***. Click the button with the gear icon again and select ***Use this device for sound input***.

   OS X 10.5 and earlier: Ensure that the MixPre-D is selected for both the ***Default Input*** dropdown menu and the ***Default Output*** dropdown menu in the ***System Settings*** section.

Adjusting Sample Rate in OS X

1. Follow ***Applications> Utilities> Audio MIDI Setup*** to open the Audio MIDI Setup dialog.
2. OS X 10.6 and later: Highlight the MixPre-D item and adjust the sample rate and bit depth from the drop-down box labeled ***Format***.

   OS X 10.5 and earlier: Select the MixPre-D from the ***Properties For*** dropdown menu, then set the sample rate, channel count, and bit depth as desired from the dropdown menus in the ***Audio Input*** section and the ***Audio Output*** section.

Windows Installation and Connection

Before connecting the MixPre-D, quit all open applications that use audio. Audio application that are open when the MixPre-D is connected may not recognize the MixPre-D until the application is restarted.

Windows Vista and Windows 7 Sound Control Panel

1. Follow ***Start> Control Panel> Sound***.
2. Click the ***Playback*** tab.
3. Click to select the item labeled "MixPre-D" in the list of devices.
4. Click the ***Set Default*** button. A green check mark icon will appear next the MixPre-D entry and the phrase "Default Device" will appear below the entry, indicating that the MixPre-D is now the default playback device.
5. Click the ***Recording*** tab and repeat and repeat steps 3 and 4 to make the MixPre-D the default recording device.

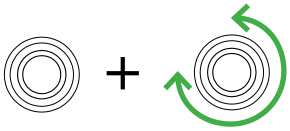
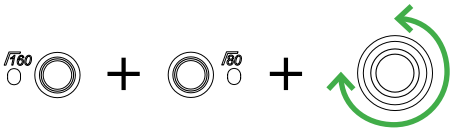
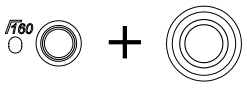
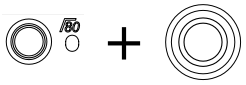
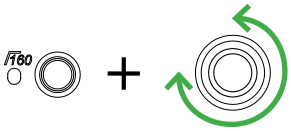
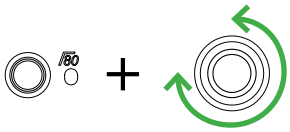
Adjusting Sample Rate in Windows Vista and Windows 7

1. Follow ***Start> Control Panel> Sound***.
2. Click the ***Playback*** tab. Highlight (Single click) the entry labeled "MixPre-D" and then Click the ***Properties*** button.
3. Click the ***Advanced*** tab. Select the desired bit depth and sample rate from the dropdown menu.

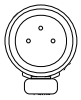
Windows XP Sound Control Panel

1. Follow ***Start> Control Panel***. The control panel view will be in either "Classic view" or "Category view".
2. If category view is enabled, click ***Sounds, Speech, and Audio Devices***, then click ***Sounds and Audio Devices***. Skip to step number 4.
3. If classic view is enabled, click ***Sounds and Audio Devices***.
4. Click the ***Audio*** tab. Select the MixPre-D from the ***Default device*** dropdown menu in the ***Sound playback*** section. Select the MixPre-D from the ***Default device*** dropdown menu in the ***Sound recording*** section.

Front Panel Button Shortcuts

Function	Key Sequence	Action
HP Source Toggle		**Press Headphone Controller.** Switches monitor source between mixer output (LED off), RTN program (solid blue LED), and computer output (flashing blue LED).
RTN Level		**Press and hold Headphone Controller then turn Headphone Controller.** Adjusts the input level of RTN input.
Limiter Threshold		**Hold Input 1 Button, hold Input 2 Button, and turn Headphone Controller.** Adjusts the threshold level of the limiter.
Input Linking		**Hold Input 1 Button, hold Input 2 Button, and slide Slate Switch right.** Switches input linking between unlinked (no LEDs), stereo linking (one LED lit), and M/S linking (both LEDs lit).
12V Phantom		**Slide and hold Slate Switch right and press Headphone Controller.** Switches between 48V phantom and 12V phantom (for mic inputs setting only).
LED Brightness		**Slide and hold Slate Switch to the right and turn Headphone Controller.** Adjusts brightness of all LEDs
Sample Rate		**Hold Headphone Controller while switching Right Output Switch to AES.** Switches between 44.1 kHz, 48 kHz, and 96 kHz sample rates.
Channel 3 Assign		**Hold Input 1 Button and press Headphone Controller.** Switches destination of left channel of RTN input between RTN left (-30 on meter), left output bus (-18), center output bus (-16), and right output bus(-14).
Channel 4 Assign		**Hold Input 2 Button and press Headphone Controller.** Switches destination of right channel of RTN input between RTN right (-30 on meter), left output bus (-18), center output bus (-16), and right output bus (-14).
Channel 3 Level		**Hold Input 1 Button and turn Headphone Controller.** Adjusts input level of input 3 (when set to something other than RTN left).
Channel 4 Level		**Hold Input 2 Button and turn Headphone Controller.** Adjusts input level of input 4 (when set to something other than RTN right).

Connector Pin Assignments

Connector		Pin Assignments	Notes
XLR-F **Analog Inputs 1-2**		1 – ground 2 – signal (+) 3 – signal (-)	3.3k ohm input impedance, Mic- and Line-level Transformer Balanced. For unbalanced, pin 1 and pin 3 tied together = ground, pin 2 = positive.
3.5 mm **Return Input**		tip – signal L ring – signal R sleeve – signal ground	Mates with 3.5 mm TRS jack. Signal is unbalanced.
XLR-M **Master Outputs/** **AES Output**		1 – ground 2 – signal (+) 3 – signal (-)	Transformer balanced, Output Level is selectable using switch between Mic or Line-level. For unbalanced, pin 1 = ground, pin 2 = positive, pin 3 = floating (unconnected). Balanced AES3 Out on Right XLR connector, 110 ohm, 2 V p-p, AES3 and S/PDIF compatible with RCA adaptor.
3.5 mm **Tape Output**		tip – signal L ring – signal R sleeve – signal ground	Mates with 3.5 mm TRS jack. Signal is unbalanced.
TA3-M **Stereo Mic Output**		1 – ground 2 – left signal 3 – right signal	Unbalanced stereo output for interconnection to stereo mic inputs. Mic level (-36 dBu). Mates with Switchcraft TA3F-type connector.
1/4-inch Female **Headphone**		tip – signal L ring – signal R sleeve – signal ground	Mates with 1/4-inch TRS jack.
Hirose 4-pin **DC Input**		1 – ground 2 – not connected 3 – not connected 4 – DC (+)	10-17 Volt DC input. Mates with Sound Devices XL-NPH and XL-WPH3 powering accessories. See Accessories for details.

Specifications

Frequency Response	20Hz - 30 kHz, +0.2, -0.5 dB (relative to 1 kHz level with 150 ohm source, gain controls set at 50%)	
Equivalent Input Noise	-126 dBu (-128 dBV) max. mic in to line out (150 ohm source, flat weighting, 22 Hz - 22 kHz bandwidth, gain control set at 50% or higher, phantom power off)	
Input Clipping Level	-10 dBu min. (mic level)	+28 dBu min. (line level)
Gain	• Line to Line, max: 26dB • Line to Mic, max: -14dB	• Mic to Mic, max: 26dB • Mic to Line, max: 66dB • Unbalanced mic TA3 relative to Line out: -36dB
Dynamic Range	110 dB min., mic input to line output	
THD + Noise	0.05% max. (from 50 Hz to 22 kHz @ +4 dBu output level)	
Common Mode Rejection Ratio	100 dB min. at 80 Hz, 60 dB min. at 10 kHz	
Inputs	Transformer-balanced, 2k mic input impedance, 16k line input impedance	
Outputs	• XLR-Line/Mic: active-balanced, 100 ohm output impedance • XLR-AES3: balanced, 110 ohm, two-channel, on right XLR connector • TA3: unbalanced mic-level output, pin-2 left, pin-3 right, pin-1 ground, 200 ohm output impedance • Tape (3.5 mm) Unbalanced, tip-left, ring-right, sleeve-ground, 2.1k ohm output impedance	
Output Noise	-100 dBu (-102 dBV) max. (22 Hz - 22 kHz bandwidth, flat filter)	
High Pass Filters	80 Hz or 160 Hz (switch selectable), 6 dB per octave	
Phantom Power	12-volt through 680 ohm resistors or 48-volt through 6.8 k resistors (switch selectable)	

Limiter	• Threshold adjustable • +6 dBu to +18 dBu • 20:1 limiting ratio	• 1 mS attack time • 500 mS release time.
Metering	• 16 segment x 2 GaN (Gallium Nitride) meters, • peak + VU responding	
Powering	Internal: 2 AA alkaline batteries, 4 hours life typical, no phantom power	External: 10-17 VDC via 4-pin Hirose, pin 4 = +, pin 1 = -, completely isolated floating supply
USB Connectivity	USB class-compliant device, analog input to USB output, USB monitoring in headphones	
A/D Converter	• 103 dB typical, A-weighted. • Sample rate selectable 44.1 k, 48 k, or 96 k.	
Temperature	• Operating: -20° C to 60° C, 0 to 95% relative humidity; (non-condensing) • Storage: -40° C to 85° C	
Weight	0.7 kg, 1.5 lbs with batteries	
Dimensions	43 mm x 94 mm x 140 mm (h x w x d), (1.7" x 3.7" x 5.5")	

Accessories

Several high-value accessories are available for the MixPre-D. For a full list of Sound Devices products and accessories, visit our web site **www.sounddevices.com/products**.

Optional MixPre-D Related Accessories

XL-2F	25-inch XLR-F to TA3-F cable, used to connect the MixPre-D's balanced analog (XLR-M) outputs to units with balanced, TA3-M inputs (7-Series recorders); package of two.
XL-4	Bag of four (4) TA3-F-type connectors.
XL-3	TA3-F to 3.5 mm TRS, used to connect the MixPre-D's unbalanced, stereo mic level output (TA3-M) to camera inputs, or for connecting the MixPre-D's Tape Output (3.5mm TRS) to the Mix Input (TA3-M) on a 302, or 552.
XL-AB	Anton Bauer D-tap to Hirose 4-pin, 12-inch, to power mixer from Anton Bauer-equipped camera
XL-CAM	Removable top-mounted 1/4-20 thread mount
XL-TA25	TA5F to 3.5 mm TRS, 12-inch, used to connect MixPre-D Tape Output (3.5mm) to 552 TA5M Link I/O (TA5M).
XL-H	Bare Hirose 4-pin locking DC connector (HR10-7P-4P).
XL-NPH 	NP-type battery cup with 24-inch cable terminated in Hirose 4-pin locking DC connector (HR10-7P-4P) at equipment end.
XL-WPH3 	AC to DC Power Supply (in-line) 100 - 240V 50/60 Hz input, 12 VDC 3.75 A (45 W) output, Hirose 4-pin DC plug. Supplied with 3-pin IEC cord for use in North America and Japan.

Warranty and Technical Support

Warranty & Service

Sound Devices, LLC strongly encourages you to register your product.

Registering can extend your warranty and ensures you will receive timely updates.

www.sounddevices.com/support/registration

Read your warranty here:

www.sounddevices.com/support/warranty

For all service, including warranty repair, please contact Sound Devices for an RMA (return merchandise authorization) before sending your unit in for repair. Product returned without an RMA number may experience delays in repair. When sending a unit for repair, please do not include accessories, including SSD drives, CF cards, batteries, power supplies, carry cases, cables, or adapters unless instructed by Sound Devices.

Sound Devices, LLC
Service Repair RMA #XXXXX
E7556 State Road 23 and 33
Reedsburg, WI 53959 USA
telephone: (608) 524-0625

Technical Support / Bug Reports

For technical support and bug reporting on all Sound Devices products contact:

Sound Devices, LLC
E-mail: *support@sounddevices.com*
web: *www.sounddevices.com/support/*
Telephone: +1 (608) 524-0625 / Toll-Free in the U.S.A.: (800) 505-0625
Fax: +1 (608) 524-0655

Sound Devices cannot guarantee that a given computer, software, or operating system configuration can be used satisfactorily with the MixPre-D based exclusively on the fact that it meets our minimum system requirements.

CE Declaration of Conformity

According to ISO/IEC Guide 22
Sound Devices, LLC
E7556 State Road 23/33
Reedsburg, WI 53959 USA

declares that the product, MixPre-D Field Mixer is in conformity with and passes:

EN55103-1, 1997	EMC-Product family standard for audio, visual, audio-visual and lighting control apparatus for professional use - Part 1: Emissions
EN55103-2, 1997	EMC-Product family standard for audio, visual, audio-visual and lighting control apparatus for professional use – Part 2: Immunity
EN61000-4-2 (2001)/ IEC61000-4-2 (2001)	ESD, ±4 kV contact, ±8 kV air discharge
EN61000-4-3 (2001)/ IEC1000-4-3 (2001)	Radiated RF immunity, 10 V/m, 80% 1 kHz amplitude modulation
EN61000-4-4 (2001)/ IEC61000-4-4 (2001)	AC and DC power ports: EFT Burst: ±0.5 kV - ±2kV
EN61000-4-4 (2001)/ IEC61000-4-4 (2001)	Signal (>3m), Control & Measurement (>3m): EFT Burst: ±0.5kV
EN61000-4-5 (2001)/ IEC61000-4-5 (2001)	AC Input Ports: Surge: ±1kV Differential Mode (line to line) ±2kV Common Mode (line to ground)
EN61000-4-5 (2001)/ IEC61000-4-5 (2001)	Signal (>30m) Surge: ±1kV Common Mode
EN61000-4-6 (2001)/ IEC61000-4-6 (2001)	AC & DC Power Ports Conducted RF Immunity: 3 V, 80% AM modulation @ 1kHz
EN61000-4-6 (2001)/ IEC61000-4-6 (2001)	Signal (>3m) (Control & Measurement) (>3m) Conducted RF Immunity: 3 V, 80% AM modulation @ 1kHz
EN61000-4-8 (2001)/ IEC61000-4-8 (2001)	Display & Magnetic Sensors Magnetic Field Immunity: 3 A/M
IEC61000-4-11 (2001)	AC input ports Voltage Dips and Short Interruptions: 70%, 40% and 5% nominal for 10ms, 100ms, 1 sec. and 5 sec. (50Hz)

Tested by L. S. Compliance, Inc. Cedarburg, Wisconsin
March 21-22, 2011

Matthew Anderson
Director of Engineering
Sound Devices, LLC

SOUND DEVICES

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