

SOUND DEVICES



302

Compact Production Mixer User Guide and Technical Information

Sound Devices, LLC
E7556 State Rd. 23/33 • Reedsburg, WI • USA
+1 (608) 524-0625 • fax: +1 (608) 524-0655
Toll-Free: (800) 505-0625
www.sounddevices.com
support@sounddevices.com

Table of Contents

Limitation of Liability	3	Tone Oscillator/Slate Microphone	15
Quick Start Checklist	4	Tone Oscillator	15
Powering the 302	4	Slate Microphone	15
Interconnection	4	The Meter	16
Setting Output Gain Structure	4	Source	16
Setting Input Levels	4	Scale	16
Monitoring	4	IRT Scale Compliance	16
Front Panel Descriptions	5	Ballistics	16
Input Panel Descriptions	6	Ballistics Lock	17
Output Panel Descriptions	7	Illumination Intensity	17
Inputs	8	Mixer Linking	18
Mic/Line Level Selection	8	Powering	18
Gain (Trim)	8	Power Switch and LED	18
Channel Fader	8	Internal Batteries	19
Phantom and T-Microphone Powering	9	External DC Sources	19
High-Pass Filters	9	Power Metering	19
Pan Switches	10	Power Consumption	19
Input Limiters	10	The Setup Menu	20
LED	10	Entering the Setup Menu	20
Peak LED	10	Output Limiter Adjustment	21
Polarity Reverse - Input 2	10	Advanced Gain Structure and Interconnection ..	22
Stereo Linking of Inputs 1 and 2	11	Full Scale Tone	22
Inputs 4 & 5	11	Setup Menu (v 3.6)	23
Outputs	12	Specifications	24
XLR Outputs	12	Accessories	26
XLR Output Level	12	CE Declaration of Conformity	27
Tape Out (Mix Output)	13	Warranty and Technical Support	28
Output Limiters	13	Warranty	28
Headphone Monitoring	13	FCC Statement	28
HP Monitor Selection	14		
Headphone Level and Overload LED	14		

Welcome

The 302 is the essential portable mixer for production companies and camera operators wanting to take control of their audio. The 302 is stunning in size, flexibility, control and performance; it is the most compact and cost-effective battery-powered professional audio mixer in its class.

With important features to accommodate nearly any over-the-shoulder production, the 302 can interface with any professional microphone, wireless system, or camera/recorder input. Its microphone inputs share the same superb circuitry of all Sound Devices field production tools.

With many of the controls of Sound Devices flagship 442 mixer, the 302 has a complete feature-set in a compact, functional design. All controls are accessible on its three main surfaces. Its high-efficiency power circuitry runs the mixer from either three internal AA batteries or external 5–18 VDC.

The 302 is part of Sound Devices family of field production audio tools, which includes mixers, preamplifiers, computer interfaces, recorders, and their accessories.

Limitation of Liability

LIMITATION ON SOUND DEVICES' LIABILITY. SOUND DEVICES, LLC SHALL NOT BE LIABLE TO THE PURCHASER OF THIS PRODUCT OR THIRD PARTIES FOR DAMAGES, LOSSES, COSTS, OR EXPENSES INCURRED BY PURCHASER OR THIRD PARTIES AS A RESULT OF: ACCIDENT, MISUSE, OR ABUSE OF THIS PRODUCT OR UNAUTHORIZED MODIFICATIONS, REPAIRS, OR ALTERATIONS TO THIS PRODUCT, OR FAILURE TO STRICTLY COMPLY WITH SOUND DEVICES, LLC'S OPERATING AND INSTALLATION INSTRUCTIONS. TO THE FULLEST EXTENT PERMITTED BY LAW, SOUND DEVICES SHALL HAVE NO LIABILITY TO THE END USER OR ANY OTHER PERSON FOR COSTS, EXPENSES, DIRECT DAMAGES, INCIDENTAL DAMAGES, PUNITIVE DAMAGES, SPECIAL DAMAGES, CONSEQUENTIAL DAMAGES OR OTHER DAMAGES OF ANY KIND OR NATURE WHATSOEVER ARISING OUT OF OR RELATING TO THE PRODUCTS, THESE TERMS AND CONDITIONS OR THE PARTIES' RELATIONSHIP, INCLUDING, WITHOUT LIMITATION, DAMAGES RESULTING FROM OR RELATED TO THE DELETION OR OTHER LOSS OF AUDIO OR VIDEO RECORDINGS OR DATA, REDUCED OR DIMINISHED AUDIO OR VIDEO QUALITY OR OTHER SIMILAR AUDIO OR VIDEO DEFECTS ARISING FROM, RELATED TO OR OTHERWISE ATTRIBUTABLE TO THE PRODUCTS OR THE END USER'S USE OR OPERATION THEREOF, REGARDLESS OF WHETHER SUCH DAMAGES ARE CLAIMED UNDER CONTRACT, TORT OR ANY OTHER THEORY. "CONSEQUENTIAL DAMAGES" FOR WHICH SOUND DEVICES SHALL NOT BE LIABLE SHALL INCLUDE, WITHOUT LIMITATION, LOST PROFITS, PENALTIES, DELAY DAMAGES, LIQUIDATED DAMAGES AND OTHER DAMAGES AND LIABILITIES WHICH END USER SHALL BE OBLIGATED TO PAY OR WHICH END USER OR ANY OTHER PARTY MAY INCUR RELATED TO OR ARISING OUT OF ITS CONTRACTS WITH ITS CUSTOMERS OR OTHER THIRD PARTIES. NOTWITHSTANDING AND WITHOUT LIMITING THE FOREGOING, IN NO EVENT SHALL SOUND DEVICES BE LIABLE FOR ANY AMOUNT OF DAMAGES IN EXCESS OF AMOUNTS PAID BY THE END USER FOR THE PRODUCTS AS TO WHICH ANY LIABILITY HAS BEEN DETERMINED TO EXIST. SOUND DEVICES AND END USER EXPRESSLY AGREE THAT THE PRICE FOR THE PRODUCTS WAS DETERMINED IN CONSIDERATION OF THE LIMITATION ON LIABILITY AND DAMAGES SET FORTH HEREIN AND SUCH LIMITATION HAS BEEN SPECIFICALLY BARGAINED FOR AND CONSTITUTES AN AGREED ALLOCATION OF RISK WHICH SHALL SURVIVE THE DETERMINATION OF ANY COURT OF COMPETENT JURISDICTION THAT ANY REMEDY HEREIN FAILS OF ITS ESSENTIAL PURPOSE.

Quick Start Checklist

Proper setup of sound sources and input devices is quick and easy with the 302. Follow the steps outlined below for basic interconnection.

Powering the 302

1. Insert three AA-batteries with + side first into the mixer battery tube.
2. Slide the power switch to the INT position to power the 302. The power LED will illuminate solid green with good batteries.

Interconnection

1. Connect the XLR output connectors of the 302 to the destination recorder, camera, or other input.
2. Connect microphones, wireless receivers, or other signal sources to the XLR input connectors.
3. Switch phantom or T-power on, as need by microphone sources.

Setting Output Gain Structure

1. Determine the required input level of the destination source. If a line level connection is required, no further output level adjustment is needed on the 302. If the input level of the receiving device requires less than line level, such as microphone or a -10 dBu level, adjust the master output level accordingly in the Setup Menu (*see Output Level Control*).
2. Turn on the 302's tone oscillator. Adjust the input sensitivity on the destination device so that the 302 output is at an average level with sufficient headroom to accommodate signal peaks. For many digital cameras and recorders, this is often a range between -20 and -12 dBFS as read on the recorder or camera's peak meter. With analog devices, it is typical to set input sensitivities so that tone is near 0 VU.

Setting Input Levels

1. Select the input type, mic or line, for each input channel.
2. Set the channel fader to the unity gain position (0 dB).
3. Attenuate the input gain control (push-up trim) while talk-testing inputs so that signal indicates on both the 302's level meter and the receiving recorder/camera level meter.

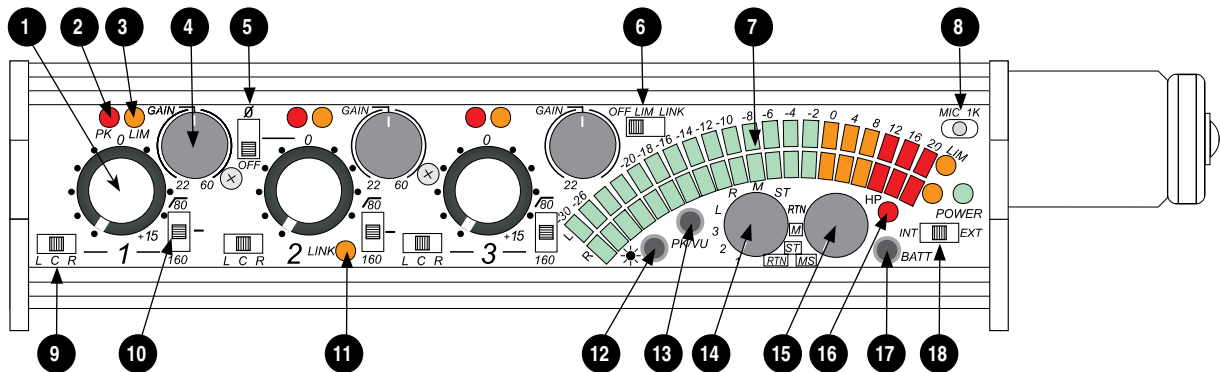
Monitoring

1. Connect headphones to the headphone connector located on the input panel.
2. Set the headphone source to ST to monitor stereo program. Raise the headphone volume level to the desired level.

The 302 headphone output is capable of producing ear-damaging levels. Turn down levels before switching headphone sources.

3. Monitor individual sources by moving the headphone selection switch to the 1, 2, or 3 positions.

Front Panel Descriptions



- 1. Fader**
Primary control for adjusting the input level during operation.
- 2. Peak LED**
When illuminated, indicates that the channel level is approaching the clipping point.
- 3. Limiter LED**
When illuminated, indicates that the channel limiter is active and is reducing the channel gain to prevent overload.
- 4. Gain (Trim)**
Coarse input gain control. Sets the initial input sensitivity level so that the Fader can be used for fine gain adjustments.
- 5. Polarity Reverse Switch – Input 2**
When engaged, the polarity of Input 2 is reverse (180° out-of-phase) with respect to inputs 1 and 3. Useful to flip the stereo image with MS stereo.
- 6. Limiter Switch**
Activates both input and output limiters. ON is dual-mono limiter operation, LINK is stereo operation. Output limiter threshold is set in the Setup Menu.
- 7. Output Meter**
Sunlight-viewable, 20-segment LED meter. Calibrated in dBu when peak-reading.
- 8. Slate Mic/Tone Switch**
Two-position switch, activates the slate microphone in the left (momentary) position, or the tone oscillator in the right (latched) position. Additional options are available in the Setup Menu.
- 9. Pan Switch**
Assigns the input channel to the output bus. Left-only, Center (equal left and right), or Right-only.
- 10. High-Pass Filter (Low Cut)**
Three-position switch engages the high-pass filter. Used to reduce excessive low frequencies. 12 dB per octave at 80 Hz or 160 Hz. Center position is off.
- 11. Stereo Link LED (Inputs 1 & 2)**
Indicates that inputs 1 and 2 are linked as a stereo pair. Controlled in the Setup Menu. In L/R stereo link input 2 Fader controls overall stereo level. When in MS position input 1 Gain (Trim) controls Mid, input 2 Gain (Trim) controls the amount of stereo (Side) information and the input 2 Fader controls the overall MS stereo level.
- 12. Meter Brightness**
Controls the brightness of the LED output meter. Each push selects among the four brightness levels.
- 13. Meter Ballistics**
Toggles among the available meter ballistic options: VU-only, peak-only, combo peak/VU, peak-hold/VU.

14. Headphone Selector Switch

Sets the signal source sent to headphones. Options include: input PFL 1, 2, 3; left output bus; right output bus; Mono (summed left and right); STereo master; RTN - stereo monitor return; MS-mono; MS-stereo; RTN-MS.

15. Headphone Volume

Adjusts the overall volume of the headphones. NOTE: the headphone output is capable of ear-damaging levels. Take care when adjusting among signal sources.

16. Headphone LED

Indicates signal overload in the headphone and RTN circuits.

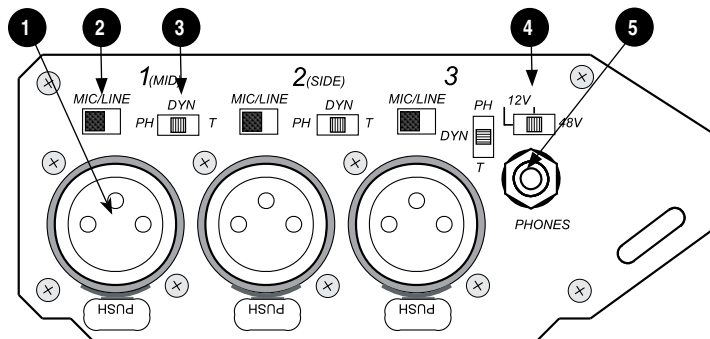
17. Battery Check Button

Press and hold to display the internal and external battery levels on the output meter. Battery level remains for two seconds after button release

18. Power Switch/LED

Three-position switch, selects between internal battery power or external DC sources, middle position is off. Power LED illuminates when power is on. LED flashes when voltage reaches low limit. *See Powering.*

Input Panel Descriptions

**1. XLR Inputs**

Transformer-balanced channel inputs. 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 Channel Switch

Selects the input level of the adjacent connector. Mic level has 40 dB more gain than line level.

3. Phantom/DYNAMIC/T-Power Selection

Selects the microphone powering type of the adjacent input. DYN position turns off all microphone powering. Mic powering is selected per input. NOTE: Use T-Powering only for T-Powered microphones.

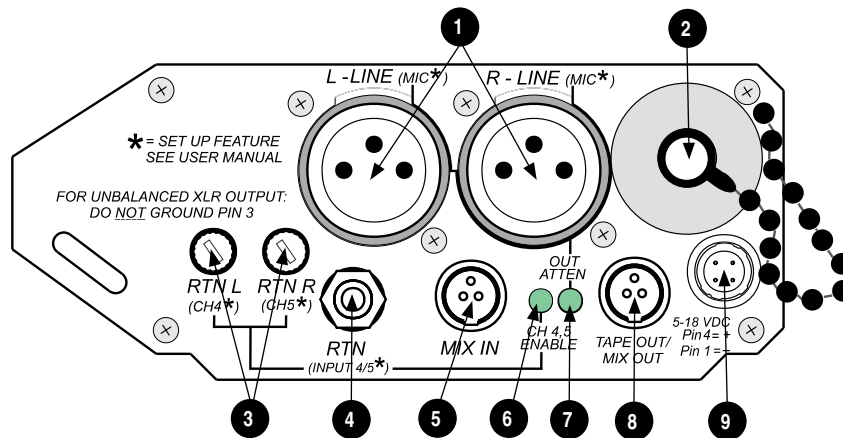
4. Phantom Voltage Selection

Selects between 48 V or 12 V phantom voltage for all input channels. The three-position switch uses two positions for 12 V, there is no difference between these positions.

5. Headphone Output

3.5 mm TRS stereo headphone output. Can drive headphones from 8 to 2000 ohms to required monitoring levels.

Output Panel Descriptions



- 1. XLR Master Outputs**
Active-balanced outputs. Pin-1 = ground; pin-2 = 'hot'; pin 3 = 'cold'. Can be unbalanced by using pin-2 for signal and pin-1 for ground.
- 2. Battery Tube**
Holds three-AA batteries for internal powering. Accepts alkaline, lithium, or NiHM rechargeable cells.
- 3. Return (Channel 4/5) Level Control**
Adjusts the gain of the return feed to balance program and monitor signals in headphones.
- 4. Return (Channel 4/5) Input**
Unbalanced stereo 3.5-mm input connector for return monitor audio. 3.5-mm wired tip = left, ring = right, sleeve = ground. Connection used for inputs 4 & 5 when selected in Setup Menu.
- 5. Mix In**
An input to the master bus designed exclusively to link the Tape Out/ Mix Out of 302, 442, MixPre, or MP-2 to the 302 for additional inputs. Pin-1 = ground, pin-2 = left, pin-3 = right. Shell of TA3 connector must be grounded to pin-1 to open connection.
- 6. Channel 4/5 Activation LED**
When illuminated, indicates that the return connector is now set as input 4 and 5 in the Setup Menu.
- 7. Output Attenuation LED**
When illuminated, indicates that the XLR output connectors are set for a level other than the factory default line level. *See Setup Menu to set XLR output levels.*
- 8. Tape Out / Mix Out**
Unbalanced stereo output on TA3-type connector. Same program as master output. Pin-1 = ground, pin-2 = left, pin-3 = right. Also used to link to the Mix In of a 442 or 302.
- 9. DC Input**
Accepts DC voltages from 5–18 VDC for mixer powering. Hirose 4-pin connector wired pin-1 negative (-), pin-4 positive (+). Ext DC is completely isolated (floating) from the rest of the circuitry.

Inputs

The 302's inputs consist of three, full-featured microphone preamplifiers. Each input has a wide gain range to accommodate nearly all signal types. The 302 easily accepts signals from low-sensitivity ribbon and dynamic microphones, medium-level wireless and condenser mic outputs, and "hot" line-level signals.

The XLR inputs of the 302 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 302 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 302 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 302.

Mic/Line Level Selection



Selects the general input level for each input channel. Switch between Mic/Line levels using the switch adjacent to the respective XLR input. Taking into account all gain stages, the 302 has 75 dB of available gain from mic input to line output. When inputs are set to the LINE position, the input sensitivity is reduced by 40 dB.

Gain (Trim)




Like traditional mixing consoles, the 302's input sensitivity is set with the Gain (trim) potentiometer. With the Fader set to unity gain (0 dB or 12 o'clock), make the appropriate adjustments with the Gain (trim) pot. Make coarse gain adjustments with the Gain (trim) pot during setup. Once the gain is set to the desired level, recess the Gain (trim) pot to hide it from the 302's mixing surface.

Channel Fader

The Channel Fader is the primary level control used during mixing operation. Use the Fader to make fine level adjustments during operation. The fader can be attenuated from off (full counter-clockwise position) to +15 dB above the set Gain (Trim) level (full clockwise position).

Phantom and T- Microphone Powering

 This switch selects the type of power that will be applied to the adjacent input XLR. The 302 provides both Phantom and T-power on each channel respectively. If neither Phantom or T-power are required, with dynamic microphones for instance, it is good practice to turn off microphone powering (DYN position).

Phantom Power

Phantom powering is a fixed DC voltage between 12 and 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 302 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 302'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.

T-Powering


T-powering is a microphone powering scheme used by several European condenser microphone manufacturers. Today, T-powered microphones are not as common as phantom powered microphones, but many are still in regular use. Unlike phantom power, T-power resistively applies 12 V between the signal pins -2 and -3. The 302 provides positive T-power, on the three-pin XLR connector pin-2 has +12 volts relative to pin-3. T-power can be selected for each input.

When using "red dot" T-powered microphones (reverse polarity T-power) use a polarity-reversing adapter on the input, otherwise damage to the microphone may occur.

Phantom and T-powering are not interchangeable. Use T-powering only for T-powered microphones.

The DYN (dynamic) position does not apply any voltage to the microphone input. It is generally good practice to select the DYN position when microphone power is not required. Phantom power can capacitively couple noise into the mic inputs with poor mic cables. Do not apply phantom power when using ribbon microphones, improperly wired cables can permanently damage the microphone.

High-Pass Filters

 Each channel of the 302 has a two-position high-pass filter. High-pass (or low-cut/low 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 302's high-pass filters feature a 12 dB/octave slope with either 80 Hz or 160 Hz corner (-3 dB) frequencies. The 160 Hz settings is used when aggressive filtering is required. The 302'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 302's circuit cuts low-frequency signals before amplifying, higher headroom is achieved in presence of signals with a lot 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 302 can be used in conjunction with the microphone's filters to increase the filter's slope.

The high-pass filter is defeated when the switch is in the center position.

Pan Switches



The pan switches assign inputs to the output buses. Inputs can be sent to the left, right, or both outputs equally. The 302 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 all three inputs can be sent to the right output while an isolated mix of only one input can be sent to the left output.

Input Limiters

The 302 Input Limiters act solely as “safety” limiters. Enabling the Output Limiters with the “LIM” switch, located on the front panel, will also enable the Input Limiters. *See Setup Menu to defeat the Channel Limiters entirely.*

In normal operation, with a properly set gain structure, the threshold of the Input Limiter will not be reached. In the event of extremely high input signal levels, such as in high SPL environments, the Input Limiter(s) will activate to prevent the input signal from clipping. Without the Input Limiters, high signal conditions can overload the channel causing distortion.

Sound Devices recommends that the Input Limiters be engaged at all times. Input Limiters do not effect audio below the set threshold (just below clipping) in any way. There is no user-selectable adjustments to the Input Limiter's threshold or its envelope. When Input Channels 1 and 2 are linked as a stereo pair, the Input Limiters also are linked and perform the same gain reduction equally across the channels.

LED



Each channel has an orange limiter LED which illuminates in proportion to the amount of limiting. If the channel limiter LED illuminates substantially, reduce the amount of gain applied to the channel by turning down the Gain (trim) pot.

Peak LED



Each channel has its own red Peak LED to indicate that the signal is 3 dB below the clipping level of the respective channel. If the red Peak LED illuminates often, reduce the amount of gain applied to the respective channel by turning down the Gain (trim) pot.

Polarity Reverse - Input 2



Engaging the Polarity Reverse Switch inverts the polarity of Channel 2. Polarity reversal is often used to quickly reverse the stereo field in MS recording. The normal position is OFF, with polarity reversal occurring when the switch is in the **0** position.

Be advised that an audible pop occurs when the polarity switch changes states.

Stereo Linking of Inputs 1 and 2

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 302. Stereo linking allows the user to control the overall signal of both inputs with a single fader.

There are two modes of operation for stereo linking, X/Y link and MS stereo. Stereo linking is activated in the Setup Menu.

X/Y Stereo Link

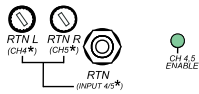
Inputs 1 and 2 can be linked as a stereo pair to simplify control when using stereo microphones. X/Y stereo linking is set in the Setup Menu. When in X/Y stereo link operation, Inputs 1 and 2 Pan switches continue to control the signal routing for each respective channel. Channel 2's Fader controls the overall level of the stereo pair. Input 1 and 2's Gain (trim) pots and High-Pass Filters continue to act independently of each other. When linked, Channel 1 and 2's Input 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. MS is a popular stereo configuration because of its good spatial placement, mono-compatibility, and surround compatibility.

The 302's MS matrix uses Input 1 for the Mid signal and Input 2 for the Side signal. Input 2's Fader controls the overall gain of the MS stereo pair. Input 1's Fader and both Input 1 and 2's Pan switches are disabled. Input 1 and 2's Gain (trim) pots and High-Pass Filters continue to act independently of each other. The Gain control for Inputs 1 and 2 are used to vary the Mid and Side levels respectively. Using the Input 2 Gain is an effective way to control the stereo spread.

Inputs 4 & 5



When additional inputs are needed, such as when multiple wireless receivers are used, the Return connector can be assigned to act as the input connector for Channels 4 and 5. This functionality is set in the Setup Menu. *See Setup Menu.*

Several options are available for Inputs 4 and 5. Either or both of the inputs can be sent to the left, right, or left and right output bus. Control the input sensitivity of Inputs 4 and 5 with the RTN L (CH4*) and RTN R (CH5*) Trim controls adjacent to the RTN (Input 4/5*) 3.5-mm Female connector.

The RTN (Input 4 and 5) Input is an unbalanced stereo input that is suitable for tape or line level devices only. There are no microphone preamps on Inputs 4 and 5.

To indicate that the Return connector is now used for Inputs 4 and 5, the 4/5 Channel Enabled LED (on the output panel) illuminates.

Outputs

The 302 is a two-bus mixer. Each input can be “hard panned” between the left and right output bus making it easy to use the 302 in either stereo or dual-mono operations. Because dialog is often recorded in mono, each output connector can be used to feed a separate camera or recorder. The 302’s Master XLR Outputs and Tape Outputs share the same program content.

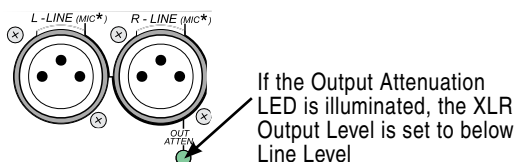
There is no master level control on the 302. The master is factory-set to unity gain, or “0” dB.

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.

XLR Output Level

The XLR Output Level is adjusted in the Setup Menu (there is no external Mic/Line level switch). *See Setup Menu for details.* From the factory, the 302 is set for Line Level (0 dB) outputs. The Output Attenuation LED, adjacent to the XLR Outputs, indicates if the XLR Outputs are set to any level other than Line Level.



Line-Level or Mic-Level (or somewhere in between)

The XLR Output Level can be attenuated anywhere from a Line level (0 dB) signal to low Mic level (-56 dB) signal. *See Setup Menu for adjustment.* Both the Left and Right XLR Outputs are adjusted simultaneously, the Left and Right Outputs cannot be attenuated independently.

Attenuation is set from 0 to -16 dB in 2 dB increments, and -40 to -56 dB in 2 dB increments. The common attenuation levels of -10 dB (Aux level), -40 dB (hot Mic-level), and -56 dB (low Mic-level) are available.

When attenuating the XLR Output level in the Setup Menu, determine how much attenuation is applied by adding the values shown by the solidly lit LEDs. For example, to set -40 dB of attenuation the values of -30 (right meter) and -10 (left meter) should be illuminated.

Output levels should be set according to the input level of the receiving device (camera, recorder, transmitter, etc.). This unique control is ideal because the gain structure of the 302 can be set precisely for any given piece of equipment.

To attenuate the XLR Outputs from Line to Mic level:

1. Turn off the mixer, if already on.
2. Press and hold the Peak/VU selection button while switching power on. Continue to hold down the PK/VU button until the -30 LED on the left meter begins to flash.
3. The Setup Menu is now entered. The XLR Output Attenuation is the first Setup Menu option indicated by the flashing -30 LED on the left meter. The solidly lit 0 dB LEDs indicate that the mixer is currently set to Line level (0 dB).
4. Use the Brightness (down) button to apply attenuation. Successively press the down button until the -30 LED on the right meter and the -10 LED on the left meter are illuminated.

- Step through all Setup Menu options by pressing the PK/VU button until the meters “dance”.

The setting is now saved and the Output Attenuation LED should now be lit.

Tape Out (Mix Output)



TAPE OUT/
MIX OUT

The Tape Output is typically used to interface with consumer inputs such as MiniDisc, DAT, and compact cassette recorders. The 302 has an unbalanced, two-channel tape level output on a single, locking Switchcraft TA3M-type connector.

The Tape Output program is identical to the XLR Output. Tape Out level is fixed at a -15 dBu nominal level and is electrically isolated from the XLR Outputs. Additionally, the Tape Output functions as the Mix Out to link multiple Sound Devices mixers. *See Mixer Linking.*

Output Limiters

OFF LIM LINK



In addition to the limiters on each input channel, the 302 has a software-controlled Output Limiter. Output Limiters are used to prevent overloading of recorders, cameras, and wireless transmitters connected to the 302. The Output Limiters on the 302 use an optoisolator-based peak limiting circuit. The Output Limiter threshold is set in the Setup Menu. The Output Limiter can be set in one of two positions, Link or LIM.

Link (Stereo Operation)

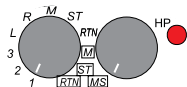
When set in the link position, the Output Limiters act identically on each (left/right) output bus. If one output causes the limiter to engage, the other bus will follow suit. This is useful when using the 302 in stereo-operation, output limiters will not affect the stereo image.

LIM (Dual-Mono)

When using each output bus separately the output limiter should be set to the ON position. This position engages each Output Limiter separately. They will act on each respective output bus independently of each other.

While all dynamics processing “distorts” the audio signal, overloading a circuit is usually far more objectionable. For most applications the limiters are a significant benefit and should be enabled.

Headphone Monitoring



The 302 has a flexible headphone circuit capable of selecting a variety of audio signals for headphone monitoring. Most professional headphones ranging in impedance from 8 ohms to 1000 ohms can be used with the 302.

The 302 headphone output is capable of producing ear-damaging levels. Turn down levels before switching headphone sources.

The Headphone Level Control adjusts the overall volume sent to the headphones. The level control adjusts both the left and right headphone outputs simultaneously.

HP Monitor Selection

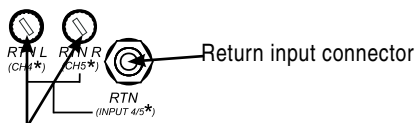
Several signal sources can be sent to the headphones. The front panel rotary switch selects the signal.

HP Sources	Description
(PFL) 1	PFL solo monitoring of the Channel 1 input signal. The channel is monitored in dual-mono. Pre-Fader, post-Limiter, and post-High-Pass. Useful for setting the channel gain.
(PFL) 2	PFL solo monitoring of the Channel 2 input signal. The channel is monitored in dual-mono. Pre-Fader, post-Limiter, and post-High-Pass. Useful for setting the channel gain.
(PFL) 3	PFL solo monitoring of the Channel 3 input signal. The channel is monitored in dual-mono. Pre-Fader, post-Limiter, and post-High-Pass. Useful for setting the channel gain.
L	Left output bus, monitored in dual-mono.
R	Right output bus, monitored dual-mono.
M	Summed mono of the left and right output bus.
ST	Stereo monitoring of the master output bus. This is the primary monitoring path.
RTN	Stereo return from the RTN monitor input path.
M-MS	Monitoring of the mono signal of an MS stereo signal.
ST-MS	Monitoring of discrete MS signals in the headphones as a decoded stereo signal.
RTN-MS	Monitoring of discrete MS return signal in the headphones as decoded stereo signal.

Headphone Level and Overload LED

The Headphone Level controls the overall headphone level sent to the headphones. The adjacent LED indicates that the headphone circuit is overloading. The LED will also illuminate with an overloaded RTN signal.

Return Monitoring



Adjusts return input level

Indicated by the RTN positions on the rotary switch, audio sources connected to the mixers 3.5-mm jack labeled RTN can be monitored in headphones. Return, or “confidence monitoring,” is useful to monitor audio from a camera or recorder. Typically, a camera’s headphone output is used as the Return Monitor source. Return levels are controlled by the headphone level, while the return level sensitivity can be adjusted with the RTN L and RTN R Trim controls.

Tone Oscillator/Slate Microphone

A single 3-position switch controls the Tone Oscillator and Slate Microphone. The Tone/Slate switch is located in the upper right corner of the front panel. The switch is protected from inadvertent engagement by the end panel. When the Tone Oscillator is engaged the inputs are muted.

MIC 1K



Tone Oscillator

Tone is used to set gain levels between the 302 and the next device in the signal path. The Tone Oscillator uses the latch position of the switch. Switch positions can be reassigned in the Setup Menu.

From the factory, the Tone Oscillator is set to output a 1 kHz tone at 0 dBu to the outputs (when the outputs are set to Line level). If you are interconnecting primarily with analog video cameras, you may want to modify the tone output level to +4 dBu in the Setup Menu. In the Setup Menu, the Tone frequency and Output level can be adjusted, and tone can be defeated altogether.

When engaged, the 302's Tone Oscillator attenuates the headphone output by 20 dB to protect the operator's ears. This feature can be defeated in the Setup Menu.

Left/Right Verification

Pressing the Battery Check button when the tone oscillator is active sets the left output level to cycle between 0 and -20 dB. This is helpful to verify proper left and right channel connection. Turning off the tone oscillator or pressing the Battery Check button again stops the output cycling.

Slate Microphone

The Slate Microphone is used to audibly notate scenes at the mixer location. Its audio performance is not suitable for critical recording applications; it should only be used for documenting scenes to tape. At factory default, the slate mic uses the momentary switch position.

In the Setup Menu, a one second 400 Hz tone can be set to precede the Slate Microphone. The Slate Microphone signal is sent to all outputs. In the Setup Menu, the Slate Microphone can be disabled altogether to prevent unintentional activation. Additionally, the switch assignments of Slate and Tone can be reversed for user convenience.

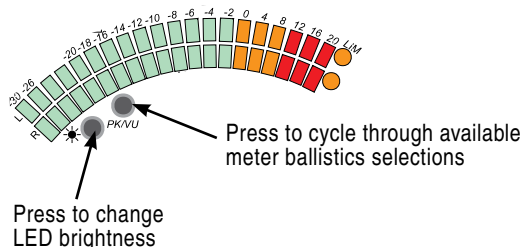
The Meter

The 302's meter provides a great deal of audio signal information to the operator. The ability to view multiple ballistics, peak levels (PPM), average levels (VU), or a combination of both, is unique to Sound Devices LED-based meters. The 302 meters do not share the inherent limitations of LCD and mechanical meters. LCD-based meters can have sluggish indications in cold temperature. Mechanical meters can be fragile and not ideal for field use.

The 302 meters share the same technology and software programmability used in Sound Devices larger 442 field mixers and on the 7-Series digital recorders.

Source

The meter can display levels of the output buses, the PFL levels, or RTN Input levels. Default operation is always the output bus except when PFL's are selected from the Headphone Selection Switch. This operation can be modified in the Setup Menu.



Scale

When viewing peak information on the meter, its scale is calibrated in peak-reading dBu. When viewing VU (Volume Units) information, its scale corresponds to VU units.

Unlike other analog mixers, the 302 is calibrated with its 0 VU reference at 0 dBu, not +4 dBu. If you primarily interconnect with analog video cameras, you may want to change the 0 VU reference to +4 dBu in the Setup Menu.

The 302's scale is designed for digital recording devices, providing maximum information between -30 dBu to 0 dBu which is where typical peaks occur (-50 to -20 dBFS). This allows the user to record with a full 12 to 20 dB of headroom while in the fine-resolution green-colored part of the meter. Additionally, the meter color changes to orange at 0 dBu and red at +8 dBu. These color changes correspond to -20 dBFS and -12 dBFS respectively, which are commonly used recording levels for today's digital recording devices.

IRT Scale Compliance

The 302 meter scale can be shifted to comply with the German IRT specifications. Setup Menu item -8 controls the adjustment to shift the meter scale. See <http://www.irt.de/> for more information.

Ballistics

Meter Ballistics refers to way the LED Meter visually displays the behavior of an audio signal. Pressing the PK/VU button on the 302's front pane will instantly display the next ballistic setting. At Factory Default, the ballistics are displayed in this order VU, Peak, Peak-Hold and VU combination, and Peak and VU combination. The selection and order of the various ballistics can be altered in the Setup Menu. *See Setup Menu for more details.*

Peak

An important setting used to display the absolute peak signal level to prevent overload of downstream devices. Peak-only is commonly used in Europe, but is being replaced by the PPM/VU combination metering.

VU

Calibrated to display the average loudness of audio signals. This setting is useful when connecting to analog recorders or in combination with peak readings. VU meters are too slow to be used as the sole metering source when interconnected to digital devices. At Factory Default, the 302 has its 0 VU reference level at 0 dBu. The meter reference level can be altered in the Setup Menu. [See Setup Menu for more details.](#)

Peak and VU combination

This setting is very informative as it simultaneously displays the absolute peak level and the average loudness of an audio signal.

Peak-Hold and VU

Identical to the Peak and VU combination setting with the exception that the peak level is held for 1500 ms. Peak-Hold is useful in applications when an overload condition is unacceptable or when program material must not exceed a prescribed threshold. This allows for easy viewing of peak values that could otherwise go unnoticed.

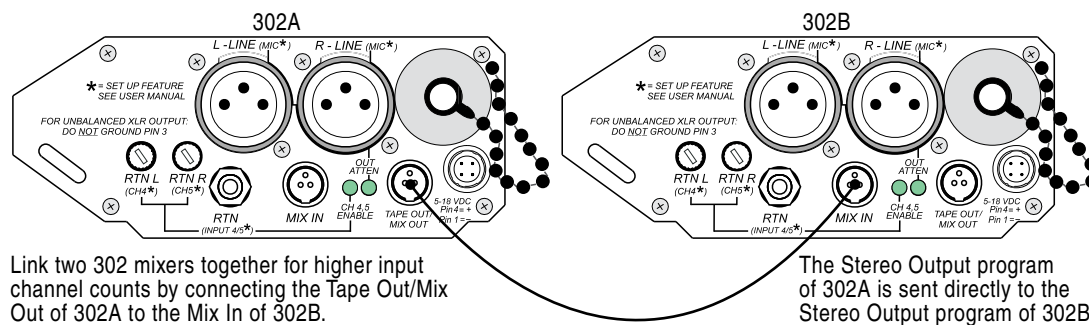
Ballistics Lock

The ballistics setting can be locked to prevent unintended changes. While pressing down the Brightness button, press the Battery Check button to lock or unlock the ballistics. There is no indication that the ballistics are locked.

Illumination Intensity

The Output Meter can be set for comfortable viewing in all lighting conditions. There are four levels of brightness intensities available on the 302. Select the intensity level best suited for the current environment. To toggle through the available intensities, press the Brightness button on the 302's front panel.

Mixer Linking



To add inputs to the 302, an additional mixer can be connected (linked) into its Mix In connection. The unbalanced Mix In connection is directly compatible with Sound Devices MixPre, 302, and 442 mixers. A simple connection between those mixer's Mix Out/Tape Out and the 302 Mix In, adds their input channel to the 302's output bus. The unit connected via the Mix In will contain all inputs.

When linking with a 442 a system of seven microphone inputs is achieved. Generally when linking to a 442, the 442 is used as the master, linking with the 302's Mix Out to the 442's Mix In. At the 442 outputs, all seven inputs appear.

Sound Device XL-1B accessory cable can be used to link multiple 302 mixers or 302 and 442 mixers. Sound Devices XL-3 accessory cable can be used to link a MixPre to the 302 for a five input system.

Link cables must be wired to short pin-1 to connector shell in order to open the Mix In connection.

Powering

The 302 can be powered from either internal batteries or from external DC. The power-efficient 302 can operate from three 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 302.

Power Switch and LED

The 3-position power switch selects between internal batteries, external DC, or power off. Because of the power supply design of the 302, the unit takes approximately 10 seconds to fully stabilize its power supply after power-up. Additionally, there is sufficient capacitance in the circuit to toggle between internal and external without disruption in audio.

The power LED illuminates solid green to indicate good power. When the power source falls below the threshold voltage [See the Setup Menu Chart](#) the power LED begins to flash. Once flashing changing the power source is recommended.

Internal Batteries

The 302 uses a unique battery tube to hold 3-AA batteries. This robust tube is sealed to prevent potential battery leakage from ruining internal circuitry. The threaded-nickel cap extends beyond the panel to make battery changes easy and quick. The battery tube extends no farther than adjacent XLR connectors.

Remove batteries when the unit is stored for extended periods.

External DC Sources

For extended mixer runtime use an external DC source. The 302 can be powered from any DC source with a voltage range of 5 volts to 18 volts. If using an AC-to-DC transformer, such as a Sound Devices XL-WPH2, make certain its output voltage falls in the 5–18 V range and can supply at least 4 watts. 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.

Power Metering

The battery check button indicates battery voltages of internal and external power supplies on the output meter. The left meter shows the internal battery voltage and the right meter shows the external battery voltage. Since many different battery types are available for external use, the external DC metering can be customized for a given battery in the Setup Menu. The power meter is read from left to right, with the highest voltage indicated with LED's lit all the way to the left (green).

Power Consumption

The 302 can vary in the amount of current it draws. Several functions of the 302 directly affect current draw in different ways. The following list highlights the larger current drawing functions (listed from highest to lowest current draw).

Microphone Powering	The main source of current beyond the idle current draw. <i>See Phantom and T-Powering</i> 48 V phantom can draw copious amounts of current out of the batteries depending on what model microphone is used. Two phantom powered microphones draw twice as much current as one. Microphones vary widely in their current draw depending on type and phantom voltage applied
Output Drive Level	Higher output drive levels into multiple, low-impedance inputs increases current draw
Headphone Output	High headphone output levels increase current draw
Meter Brightness	Current draw is slightly increased with higher illumination intensities

Experimentation is recommended to determine battery life for each individual setup and application.

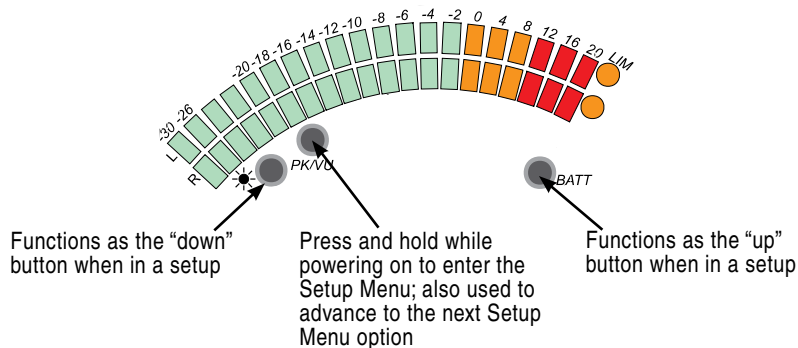
The Setup Menu

The 302 has 18 available setup features. *See the Setup Menu Chart for all available options.* Setups, typically set-and-forget features, are infrequently changed. With the Setup Menu, these features are easily accessed directly on mixer's the front panel.

Entering the Setup Menu

To access the Setup Menu perform the following steps:

1. Turn off the mixer, if already on.
2. Press and hold the Peak/VU selection switch while switching power on.
3. The Setup Menu is now entered.



The mixer will not pass audio when in the Setup Menu. When in the Setup Menu the flashing LED on the left meter (L) position indicates the selected setup feature. The right meter (R) position indicates the values selected for the setup. Use the PK/VU button advance from one setup to another. If the intended setup is passed, setup mode must be re-entered since you can only step forward through the Setup Menu.

To adjust values, the meter brightness button (down) and the battery check button (up) allow selection among setup values. Some setups have multiple values while others have only two values.

Setup Example

The following steps show how to change the tone frequency from the factory default of 1 kHz to 100 Hz.

1. Enter the setup menu by pressing and holding down the PK/VU button while powering the mixer. Hold the button until the -30 LED begins flashing.
2. Press the PK/VU button six times until the left meter LED flashes at the -16 position (see Setup Chart for a list of all setups).
3. To move among parameter values, press the brightness button (down) and battery check button (up) until the 100 Hz position is selected (-24 LED will illuminate solid).
4. Press the PK/VU button multiple times until the meters perform their scrolling dance. This saves the new setting into memory.

To save new values to memory, the PK/VU button must be repeatedly pressed until the last setup is reached. At that point the meters will "dance" and the new values will be saved to memory.

User Default

A memory location is available to store user-defined default settings. The user default is helpful to save a baseline of settings different than the factory default settings. To save a user default perform the following:

1. Hold down both the meter brightness button and battery check button while powering the mixer.
2. The current settings will be saved as the user default.

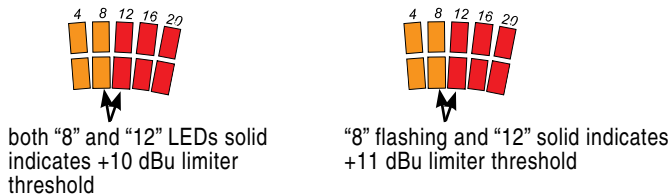
The user default settings can be recalled from the setup menu by applying the user default restore. *See the Setup Menu Chart.*

Output Limiter Adjustment

Output limiter thresholds are adjustable between +4 dBu and +20 dBu in 1 dB increments. The threshold level is shown on the lower (right) meter string by illuminating LEDs. Because LEDs are spaced every 4 dB, a combination of flashing and solid adjacent LEDs indicate limiter levels between the numbered LEDs. Factory default is 20 dBu. Each press of the battery button or meter brightness control changes the threshold by 1 dB. Three possible LED indications show threshold value:

- **Single solid LED** - actual value indicates threshold.
- **Flashing LED next to a solid LED** - indicates that the threshold is one dB above or below the solid LED value.
- **Two solid LEDs** - threshold value is even number value between the two indicated values.

Two examples are shown below, a setting of +10 dBu and +11 dBu thresholds.



Advanced Gain Structure and Interconnection

The 302's unique output attenuator circuit is adjusted in the Setup Menu. This can be thought of as a master gain control which comes after the 302's output meter. This circuit allows the user to match the 302's output level to any recording device. When properly set, the dynamic range of the system is maximized and the 302's meters will "match" the recorder's meters.

For simple interconnection the following three settings are identical to setting the output switch on the 442 mixer to "Line", "Tape", or "Mic". 0 dB – Line, 10 dB – Tape, 40 dB – Mic.

However, to tailor the 302's outputs exactly to the recording device, the 302's output can be attenuated from full line-level in 2 dB steps from 0 to 16 dB (line/tape levels), then in 2 dB steps from 40 to 56 dB (mic levels). So if 40 dB of attenuation is "too hot" for a given device's mic input, the attenuator could be set to 50 dB or more.

When interconnecting the 302 to any recording device, the best way to set the level between them is to match the 302's output clipping level with the recorder's input clipping level. When this is done and the recording device's input gain controls are kept fixed, two things will happen:

1. The dynamic range of the recording is maximized.
2. All level metering can be done via the 302's meter.

The recorder's level meter can be ignored since the only way for the recorder to clip is for the 302 to clip. The 302's meters match the recorder's meters in that the clip points match. Because most recorder's meter ballistics and scale are different, it is impossible to make the 302 meter exactly match a given recorder's meter. However, this is irrelevant if the clip levels match.

Full Scale Tone

The following information is intended for users with advanced knowledge of interconnection and gain structure.

To facilitate matching the clipping levels of the 302's output to the recorder's clip level, the 302 includes a full-scale tone output function. "Full scale" is the same as "clipping level." To activate this full scale tone, turn on the tone switch while in the Setup Menu –30 position. Be extremely careful when doing this, as a full-scale tone is extremely loud and can hurt the operator's ears. Make sure to turn down the headphone level and the level going to any amplifiers, etc. from the 302.

The advanced way to set gain structure is as follows:

1. Connect 302's XLR outputs to the recording device.
2. Enter Setup Menu (*see The Setup Menu*).
3. Turn down headphones and any amplifiers connected to the 302's other outputs.
4. Turn on the tone oscillator via its switch.
5. Turn the recording device's input gain control to its detented point (or half-way if no detent).
6. Adjust the 302's output level via the up/down buttons until the recorder is just shy of clipping as indicated on its meter.
7. If the 302's Output level is at 0 dB and the recorder is not to its clip level, increase the recorder's gain control until it is to the clip level.
8. Fix the recorder's gain controls with tape so that they do not get bumped.
9. Exit the 302's Setup Menu by pressing the PK/VU switch until the startup sequence happens. Note: The Setup Menu must be exited in this manner or else the setting will not be saved.
10. It is recommended that the 302's limiters be turned on at all times, as they will not activate until just before clipping.

Setup Menu (v 3.6)

Below is the chart of setups for the 302. See Setup Menu on page 15 for instructions on how to enter and navigate the setup menu. Factory default settings are displayed in bold.

Meter	Setup Name	Setting (value on R Meter)	Description
-30	XLR Attenuation Level	Line-level (0) , add the indicated values on left and right meter for attenuation amount	Selects the amount of attenuation from Line level on the XLR Outputs.
-26	Output Limiter Thres. Adjustment	1 dB increments from +4 to +20 dBu , level shown on meter	Sets the Output Limiter threshold in dBu. see page 12 in User Guide for more details.
-24	Stereo Link, Ch. 1/2	OFF (-30) , Stereo Link (-26), MS Link (-24)	Links inputs 1 and 2 as a stereo pair, either X/Y or MS stereo
-22	Input Limiter Defeat	OFF (-30) , ON (-26)	When ON, input limiters remain OFF at all times
-20	RTN L to Ch. 4 Input	OFF (-30) , L-only (-26), R-only (-24), L+R (-22)	Routes RTN-Left to the master bus with set pan assignment.
-18	RTN R to Ch. 5 Input	OFF (-30) , L-only (-26), R-only (-24), L+R (-22)	Routes RTN-Right to the master bus with set pan assignment.
-16	Tone Osc. Frequency	1000 (-30) , 400 (-26), 100 (-24), Hz	Selects the frequency of the sine wave tone oscillator
-14	Tone Osc. Level	OFF (-30), -20 dBu (-26) -10 dBu (-24), 1 dB increments to +8, 0 dBu is default	Selects the output level of the tone oscillator in dBu at LINE level
-12	Slate Mic ON/OFF	ON (-30) , Tone + Slate (-26), OFF (-24)	Activates the slate mic. Tone and slate offers a 400 Hz tone preceding the slate mic.
-10	Metering Source	ST & PFL (-30) , Follows headphone switch position (-26), STereo only (-24)	Selects the metering source. PFL levels are show on the left meter
-8	Meter Reference Level (VU and Peak)	0 VU = 0 dBu (-30) , 0 VU/Peak = +3 dBu (-18) 0 VU = +4 dBu (-26), 0 VU/Peak = +4 dBu (-16) 0 VU = +8 dBu (-24) 0 VU/Peak = +5 dBu (-14) 0 VU/Peak = +1 dBu (-22) 0 VU/Peak = +6 dBu (-12) 0 VU/Peak = +2 dBu (-20) 0 VU/Peak = +7 dBu (-10) 0 VU/Peak = +8 dBu (-8)	Selects VU and/or Peak dBu reference level
-6	Split-Ear Monitor	OFF (-30) , ON (-26), Program Mix (-24)	Assigns summed-mono RTN signal to left headphone output and R program to right headphone output. Active in RTN position.
-4	Headphone Attenuation w/Tone	ON (-30) , OFF (-26)	Reduces the headphone level by 20 dB when tone oscillator is activated
-2	External Battery Voltage Reference	1 (-30) , 2 (-26), 3 (-24), 4 (-22), 5 (-20), 6 (-18), see voltage metering chart below	Selects the external DC range of the voltage check function and power LED flash point
0	Meter Ballistics Select	VU PPM VU-PPMHold VU-PPM (-30) , PPM VU-PPMHold VU-PPM (-26), VU VU-PPM-Hold VU-PPM (-24), PPM VU-PPM (-22), VU VU-PPM (-20) PPM only (-18)	Selects meter ballistics choices selected when toggling the front panel meter ballistics switch
4	Master Peak LED Threshold Adjust	1 dB increments from +4 to +20 dBu , level shown on meter	Sets the signal level where the "20" LED illuminates. Used to set an alternate peak level
8	Slate/Tone Switch	Normal (-30) , reversed (-26), tone only (-24), slate only (-22)	Changes the functionality of the slate / tone switch. Switch can be defeated by engaging setup -14 and setup -12
12	Default Restore	OFF (-30) , User Default (-26), Factory Default (-24), Custom Default (-22)	Resets setup menu to either the stored default, factory default, or custom default values

Voltage Metering Chart

Setting	High Voltage	LED Flash Point	Low Voltage	Power Source
	4.5	3.4	3.0	Internal batteries
1	13.0	11.5	11.0	12 V NiCad, NiMH, Li, etc.
2	17.0	11.5	11.0	Expanded range of setting #1
3	8.5	5.75	5.5	6 V NiMH, Li, etc.
4	14.0	11.4	10	12 V Lead Acid
5	7.0	5.7	5.0	6 V Lead Acid
6	17.0	11.5	5.0	Full range of DC input, with cutoff for 12 V NiCad, etc.

Specifications

Measurement settings (unless otherwise specified): Gain controls for the channel being measured at mid point, all other channels gains fully down; pan switches centered; high-pass off; inputs in 'mic' position; outputs in 'line' position. Mic input driven with 150 ohm source. Outputs measured with 100k ohm load. Temperature at 25° C.

Maximum Gain, typical (trim, fader, master, phones RTN fully up):

Inputs

Dynamic Range	115 dB minimum (trim fully down)
Frequency Response	20 Hz to 30 kHz, +0.2, -0.5 dB, -1 dB @ 5 Hz and 50 kHz typical
Equivalent Input Noise	-126 dBu (-128 dBV) maximum (22 Hz to 22 kHz bandwidth, flat filter, trim control fully up)
THD + Noise	0.007% typical (1 kHz, +4 dBu at Line out) 0.009 max (50 Hz to 20 kHz, +18 dBu at Line out, fader fully up)
Input Clipping Level	0 dBu minimum (trim control fully down)
Gain Matching	±0.1 dB (Mic In to Line Out)
Common Mode Rejection Ratio	120 dB minimum at 80 Hz, mic input 100 dB minimum at 10 kHz, mic input
High-Pass Filters	Switchable 80 Hz or 160 Hz, 12 dB/oct
Mic Powering (each XLR selectable)	Dynamic (no power applied), 12 V Phantom - through 680 ohm resistors, 10 mA per mic available, 48 V Phantom - through 6.8k resistors, 10 mA per mic available, 12 V T-Power - through 180 ohm resistors, 10 mA per mic available
Input Limiters	+18 dBu threshold, 20:1 limiting ratio, 1 mS attack time, 200 mS release time.

	Impedance: (Ohms Actual)	Type:	For use with:	Max Input Level:
XLR, mic setting	2.5k	transformer-balanced	< 600 ohm mics	0 dBu (0.78 Vrms)
XLR, line setting	16k	transformer-balanced	< 2k ohm outputs	+40 dBu (80 Vrms)
Mix In	4.2k	unbalanced, stereo	302, 442 Mix Out (1.8k)	+6 dBu (1.5 Vrms)
Return & ch 4/5	10k	unbalanced	< 2k ohm outputs	+30 dBu

Outputs

Line Output Clipping Level (1% THD)	20 dBu minimum 18 dBu minimum with 600 ohm load
Output Noise	-100 dBu (-102 dBV) maximum (22 Hz to 22 kHz bandwidth, flat filter, master gain fully up, faders fully down)
Output Limiters	affects the Line Output and Tape Out, threshold selectable from +4 dBu to +20 dBu, 1 dB steps, 20:1 limiting ratio, 1 mS attack time, 200 mS release time

	Impedance: (Ohms Actual)	Type:	For use with:	Max Output Level:
XLR, factory Line setting	150	active-balanced	>= 600 ohm mics	+20 dBu (7.8 Vrms)
XLR, mic (lowest) setting	150	active-balanced	<2k ohm outputs	-36 dBu
Tape Out / Mix Out TA3	1.8k	unbalanced, stereo	>6k ohm inputs	+6 dBu (1.5 Vrms)
Headphones - 3.5 mm	200	unbalanced, stereo	8-2k ohm phones	+20 dBu (7.8 Vrms)

	XLR Input Mic Setting	XLR Input Line Setting	RTN / ch 4/5
XLR Output @ factory (line) setting	75 dB	35 dB	20 dB
XLR Output attenuated	0–16 dB 2 dB steps	40–56 dB, 2 dB steps	25–41 dB, 2 dB steps
Tape Output TA3-type	61 dB	21 dB	6 dB
Headphones, 1/4-in and 3.5 mm	95 dB	55 dB	30 dB

Metering

LED Metering 40-segment (2 x 20), sunlight-viewable
Selectable Peak, VU, or Peak (with or without peak hold) + VU ballistics

Environmental

Operation and Storage Operating: –20°C to 60°C, 0 to 95% relative humidity; (non-condensing); Storage: –40°C to 85°C

Power

Internal Voltages	±16 VDC (bi-polar) regulated audio rails
Power supply (batteries)	2.4–6 V range internal batteries; isolated (floating)
Power supply (external)	external DC input jack, 5–18 V, locking 4-pin Hirose connector, pin-4 = (+), pin-1 = (–), use Hirose #HR10-7P-4P (DigiKey# HR100-ND) for locking mating DC connector.
Power Consumption	130 mA @ 4.5 V, internal batteries, idle, no phantom 55 mA @ 12 V external DC, idle, no phantom

Dimensions and Weight




Size	47 mm x 214 mm x 114 mm (H x W x D) 1.8" x 8.4" x 4.5"
Mass	0.85 kg, (1.8 lbs) unpackaged with three alkaline AA batteries

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.

Accessories

Several high-value accessories are available for the 302 mixer, including a carry-case, cables, and power accessories. For a full list of Sound Devices products and accessories, visit our web site www.sounddevices.com/products.

<p>CS-3</p> 	<p>Production case with high-quality strap for use with 302, 7-Series recorders and MixPre; NP-type battery compartment and accessory pouch for wireless. Built for Sound Devices by CamRade.</p>
<p>CS-MAN</p>	<p>Convenient, padded carry/storage case with handles, handy to store wallets, keys and mobile phones; handcrafted in China.</p>
<p>XL-1B</p>	<p>TA3-F to TA3-F Interconnection cables for 302-to-302 and 302-to-442 linking; 12-inch.</p>
<p>XL-3</p>	<p>3.5 mm to TA3-F link cable for MixPre/MP-2 Tape Output to 302 Mix In; 20-inch.</p>
<p>XL-4</p>	<p>Bag of four (4) TA3-F-type connectors.</p>
<p>XL-7</p>	<p>TA3-F to 3.5 mm jack to connect unbalanced, stereo TA3 tape out connection to unbalanced stereo 3.5-mm inputs., 15-inch.</p>
<p>XL-14</p>	<p>3.5 mm male TRS to 1/4-inch female TRS jack for headphone extension, 12-inch.</p>
<p>XL-H</p>	<p>Bare Hirose connector, (Hirose p/n HR10-7P-4P) to mate with locking 4-pin DC power jack.</p>
<p>XL-NPH</p> 	<p>NP-type battery cup with 24-inch cable with Hirose 4-pin locking power jack at equipment end.</p>
<p>XL-WPH3</p> 	<p>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.</p>

CE Declaration of Conformity

According to ISO/IEC Guide 22

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

declares that the product, 302 Production Field Mixer is in conformity with and passes:

EN55103-1, 1997	EMC-product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use. Part 1: Emissions
EN55103-2, 1997	EMC-product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use. Part 2: Immunity
EN55103-1 Phenomena 2, 3, 1997	Magnetic emissions at 1 meter 50 Hz – 50 kHz
EN55103-2 Phenomena 3, 1997	Magnetic immunity 50 Hz to 10 kHz
CISPR 22 (EN55022) 2003	Radiated and conducted emissions, Class B
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 power ports: EFT Burst, I/O lines, ± 0.25 kV to ± 1.0 kV, power line ± 0.5 kV – ± 1 kV
EN61000-4-4 (2001)/ IEC61000-4-4 (2001)	EFT Burst, I/O lines, ± 0.25 kV to ± 1.0 kV, power line ± 0.5 kV – ± 1 kV
EN61000-4-5 (2001)/ IEC61000-4-5 (2001)	Surge ± 1 kV differential mode (line-to-line), ± 2 kV common mode (line-to-ground)
EN61000-4-6 (2001)/ IEC61000-4-6 (2001)	Conducted RF immunity, 3 V, 80% @1 kHz amplitude modulation
EN61000-4-11 (2002)/ IEC61000-4-11(2001)	Voltage dips and short interruptions at test voltage level: 0% V unominal @ 70% V unominal @ 25 period

Tested by L. S. Compliance, Inc. Cedarburg, Wisconsin
March 26, 2003



Matthew Anderson
Director of Engineering
Sound Devices, LLC

Warranty and Technical Support

Sound Devices, LLC warrants the 302 against defects in materials and workmanship for a period of ONE (1) year from date of original retail purchase. Users who register their product directly with Sound Devices Technical Support by mail, online, or phone, will receive an additional ONE (1) year of warranty coverage, extending the complete warranty period to TWO (2) years from the date of original retail purchase. In order to extend the warranty coverage period, registration must be completed within the initial ONE (1) year warranty period. Products must be purchased through authorized Sound Devices resellers to qualify for Warranty coverage. Damage resulting from the opening of a Sound Devices product or attempted repairs by a non-authorized Sound Devices repair technician will void warranty coverage.

This is a non-transferable warranty that extends only to the original purchaser. 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 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 repairs and replacements may be completed using refurbished, returned or used parts that have been factory certified as functionally equivalent to new parts.

Sound Devices, LLC
Services Repair RMA #XXXXXX
E7556 State Road 23 and 33
Reedsburg, WI 53959 USA
Telephone: +1-608-524-0625

SOUND **DEVICES**