



pocket tools

dual mix



AER The Acoustic People®

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dual mix

user manual

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1. Introduction

Welcome to AER!

Thank you for purchasing an AER **Pocket Tool**. You are now the owner of a professional audio preamp, designed and manufactured to the highest pro audio technical specifications; capable of shaping, maximizing and delivering the tonal character of your instrument. At AER our complete focus, some say obsession, is on the 'true' reproduction of natural acoustic sound. A lifetime spent listening to and working with acoustic instruments helps us to create and refine the very best devices available; to enable you to craft your own unique acoustic identity. Make your instrument the very best it can be ...

Please take a moment to read this brief manual. We want you to understand how our product works and what it can do for you. We want you to gain benefit from its many features but most of all we want you to ENJOY it!

The **dual mix** is a high-quality „two-channel“ preamplifier for instrument/line or microphone signals. The unit offers simple, efficient features just like a small mixing console:

- **two inputs**, each for one microphone or instrument and line-level signal with **switchable 24V-phantom-power**
- separate active **two-band EQ networks** for each input
- a **4-preset multi-effects-unit** with two reverbs, one echo and one chorus
- a **stereo aux-in**
- **line-out** and **DI-out**
- plus a **stereo-headphone-preamplifier**

This makes the **dual mix** especially suited for the following applications:

- as **channel extension** in connection with AER-amplifiers (the line output of the dual mix is connected e.g. with an amp's effects return)
- as **instrument/microphone stage preamp** (the line out or DI-out of the dual mix is connected directly to the mixing-desk/stagebox)
- as **headphone rehearsal amplifier** in connection with a stereo headphone set

All **pocket tools** need energy for their high-grade circuits and are powered by **24V-power-supplies**. An appropriate supply is included in delivery.

Read on and have fun using your **dual mix**!

2. Safety Instructions

The following guidelines shall help minimize the risk of injury through fire or electric shock.

1. Carefully read these safety notes before you use the device!
2. Keep these safety notes in a safe place.
3. Pay attention to all warnings, instructions and additional texts on the unit.
4. Do not install or use your device in close proximity to water or if you are wet yourself.
5. Use your device in a safe place where nobody can step on cables or trip over and damage them.
6. Always pull the mains plug before cleaning your device. Use only a dry cloth for cleaning. Avoid the use of detergents and do not let any liquids seep into the unit.
7. Never install your device close to units with strong electromagnetic fields such as large mains transfor-

mers, revolving machines, neon illumination etc. Do not lay signal cables parallel to power current cables.

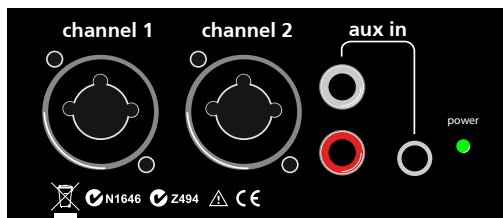
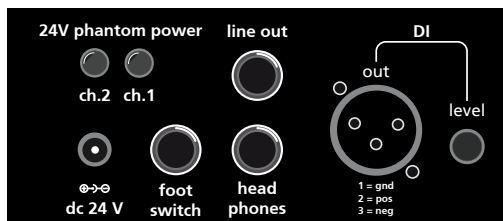
8. There are no user-serviceable components inside the unit. To avoid the risk of an electric shock, the unit must not be opened. All maintenance, adjustment and repair works should be carried out by qualified staff only. Any unauthorized tampering will void the 2-year warranty.

9. In keeping with the EMV regulations screened cables with correctly fitted connectors must be used for all signal connections.

10. Always use an earthed power supply with the correct mains voltage. If you are in doubt about the power outlets ground, have it checked by a qualified technician.

11. Cable up your device only when it is powered off.

3. Controls and Connections



Top side

gain	input level control
clip	overload indicator
line/mic	signal source selector switch (combo socket):
line	(only via 6.3 mm jackplug) for instruments (pickup) and other line level sources
mic	(only via XLR-connector) for microphones
high	treble control
low	bass control
efx	4-preset multi-effects unit
level	level control internal effect
pan	effect signal distribution control
select	effect select button with led-indicators
aux in	stereo-input for additional signal sources
level	stereo input level control
master	master level control

Rear side

dc 24 V	power supply connector socket (24 Volt DC)
24V phantom power	
ch. 1	24V phantom power switch channel 1
ch. 2	24V phantom power switch channel 2
line out	signal output, 6.3 mm mono jack socket
headphones	stereo-headphones socket
DI out	signal output, symmetrical, XLR-socket
DI level	DI out signal level control

Front side

channel 1	signal input – combo socket for 6.3 mm mono jackplug and XLR connector
channel 2	signal input – combo socket for 6.3 mm mono jackplug and XLR connector
aux-in	stereo input for additional signal sources (e.g. CD-player), RCA-sockets (white = left channel, red = right channel), parallel: 3.5 mm stereo jack socket
power	on/off-status indicator

4. Operation Summary

4.1 Cabling and Starting-up

Before connecting to the mains, please ensure that your local mains voltage (e.g. 230V in mainland Europe, 120V in the USA) is suitable for the voltage input range of the included power supply. The relevant specs and safety symbols are printed on the rear side of the unit.

Note: 24V power supply

The included 24VDC power supply is a certified wide-range model, capable of handling input voltages between 100V and 240V. A substantial amount of research, effort and testing went into the selection of this power supply. It is critical to the function of the preamp – please use no other power supply!

Also please bear in mind that any device powered from a power supply (as opposed to battery operation), may suffer interference carried by the electricity supply itself. To avoid this, always try and keep signal cables as short as possible.

We have opted for a “non-earthed power supply” (class 2 with protective insulation) in order to avoid unwanted earth or ground loops that occur when using several earthed mains powered devices in a signal chain.

Please ensure that **gain**-, **level**- and **volume**-controls are turned all the way to the left and all other controls are in their middle position (centre detent). The pushbuttons should be off, i.e. not pushed.

Now select the appropriate preamp function (**line/mic**) and make all required cable connections:

- 1) Instruments (1/4" jack or XLR) or Microphones (only XLR) to **input channel 1** and/or **channel 2** of the **dual mix**
- 2) **line-out** of the **dual mix** e.g. to effects **return** of the effect loop of an AER amplifier or to the input of a downstream device

You may also want to connect:

- 1) the **DI-out** of the **dual mix** to a mixing-desk input or a stagebox (use balanced cables for this)
- 2) a CD/MP3 player to **aux-in** or
- 3) a stereo headphone set to the **headphones** output

4.2 Level adjustment

Note: Level adjustment

By setting the level correctly we mean that the signal level in one or several devices in a signal chain is neither too high nor too low. This applies equally to all components of a unit (here e.g. **high** and **low**).

Consequently, care must be taken that no part of the circuit is overloaded, or that distortion is unintentionally added to the signal. We have carefully designed the circuit to achieve this objective whilst also providing potentiometers (**gain**, **level**, **volume**) for „manual“ intervention.

The **dual mix** is equipped with two high-quality preamps which can handle line and microphone signals and have therefore a wide input sensitivity range.

Having selected the appropriate preamp function (**mic** or **line**) and with the **gain** controls set fully counter clockwise (minimum gain), turn up the **gain** whilst playing your instrument until the red **clip** indicator LED lights up occasionally with heavy strumming. Now turn down the **gain** control (or the volume control on the source) by a tiny amount to allow additional headroom for undistorted reproduction.

During play, the **clip** control LED should only flicker intermittently at most. With **line** (signal sources with a sufficient input signal level) the **gain** controls will probably sit between minimum gain and the 10 o'clock position. It's likely that in the **mic** position the setting will be significantly higher. Please keep in mind that the filter stages are partly active and thus have an influence on the overall adjustment of the dual mix.

5. Functional Characteristics

5.1 Inputs Channel 1 and Channel 2

5.1.1 Signal Sources and Preamp Selection

Various signal sources may be connected to the XLR/line combo sockets (**channel 1 und 2**). To **Line** (6.3 mm jack socket): all types of active and passive pickups for acoustic instruments, electromagnetic pickups, keyboards, samplers. To **XLR** socket: all dynamic and condenser (vocal or instrument) microphones. The corresponding preamp is selected by the **line/mic**-switch.

5.1.2 Dual-band Equalization

The dual-band equalizer of your **dual mix** provides you with an active and high quality sound interaction tool that supports the natural tone of instruments and voice whilst simultaneously offering you the possibility of a controlled interaction.

With all controls in mid position the filters are set to produce a very pleasing and natural sound impression. The **high**-(treble) and **low**-(bass)controls allow you to modulate the sound as desired.

5.2 efx – Effects Section Multieffect

The **dual mix** has an onboard digital effects unit with **four presets: 1 = short reverb, 2 = long reverb, 3 = delay 320 ms and 4 = deep chorus**, which are called up with the **select** effects selector switch. Each pressing of this switch will shift the preset selection by one setting.

With the **pan** control the effect is assigned to the channels. In its centre position both channels will receive the same amount of wet signal, turned **fully counterclockwise only channel 1**, turned **fully clockwise only channel 2** will get a wet signal. The **level** control adjusts the effects loudness in the master signal.

5.3 aux-in

The **aux-in** is a stereo signal input (RCA/3.5 mm stereo jack, frontside) e.g. for a CD- oder MP3-player or a drum computer. Using the **level** control, the signal which is present here is blended with the master signal.

5.4 master

The **volume** control adjusts the loudness of **line-out** and **headphones** together.

5.5 DI-out

The **DI-out** yields a balanced output signal whose level can be adjusted by the **level**-control.

5.6 24V Phantom power

The **24V phantom power** switches are located on the rear side of the housing. These provide phantom power to the XLR inputs for devices that require it, e.g. condenser mics.

The 24V phantom power supply of your AER device complies with the DIN EN 61398 regulations in view of a 24V phantom power supply.

Please note the adjacent text.

Supplement to article 5.6

Information about the use of 48V or 24V phantom power (phantom power = remote supply, here: powering an audio device via the connected audio line)

Turn on the **phantom power** only if the unit connected to the XLR socket is designed to handle it! In general, suitable units are e.g. condenser microphones, active DI boxes and other special audio devices, whose power supply is drawn from the phantom power. Such devices are also labelled accordingly; please heed the permissible power consumption (max.10mA). High-quality dynamic microphones with a balanced signal need no phantom power, but can handle it anyway. Other devices which have not been designed explicitly for phantom power operation can suffer from considerable malfunctions, and damage may result as well.

Examples of devices that may be damaged by incorrect application of phantom power include:

Low-cost dynamic microphones with a mono jack plug (unbalanced signal) that were fitted afterwards with an XLR connector. Audio devices with a balanced XLR output (e.g. DI boxes, effects devices, instrument preamps with a DI output etc.) which are not protected against phantom power applied to their XLR output. (The DI connectors on AER products are protected against applied phantom power.)

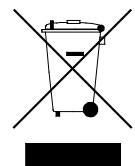
Other audio devices (such as preamps, effects pedals etc.) whose unbalanced line output was replaced by an XLR socket.

If in doubt please consult the manufacturer of the device you are using.

Experiment and enjoy your new route to alternate soundscapes!

Any questions or suggestions? Please do contact us at: tachauch@aer-amps.com

Thanks for reading!



6. Technical Data: pocket tools dual mix

Inputs

channels 1 and 2	<p>Switchable microphone or line input Combo socket, XLR and 1/4" jack (6.35 mm)</p> <p>line mode (jack input) Unbalanced high impedance input for instrument pick-ups and line-level sources Gain adjustment range: +3...+20 dB Min. input voltage: 100 mV (-20 dBV) Max. input voltage: 3 V (+10 dBV) Input impedance: 2.2 MΩ 60 pF Signal-to-noise ratio, A-weighted Min. gain: 108 dB Max. gain: 98 dB</p> <p>Frequency response: 20 Hz...20 kHz / ±1 dB THD + N (1 kHz): < 0.3%</p> <p>mic mode (XLR input) Balanced microphone input 1 = ground, 2 = positive (+), 3 = negative (-) Gain adjustment range: +4...+40 dB Min. input voltage: 10 mV (-40 dBV) Max. input voltage: 3 V (+10 dBV) Input impedance: 2.1 kΩ Unbalanced: 1.1 kΩ</p> <p>Signal-to-noise ratio, A-weighted Min. gain: 108 dB Max. gain: 93 dB</p> <p>Frequency response: 20 Hz...20 kHz / ±1 dB THD + N (1 kHz): < 0.1%</p> <p>Phantom power: 24 V, R = 1.2 kΩ per terminal, switchable for each channel, total current max. 10 mA per channel, short circuit protected</p> <p>Warning: External equipment may be damaged by inappropriate use of phantom power. In case of doubt keep the 24 V phantom power switch off (not pushed).</p>
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Clip indicator

Red LED
 Headroom: 8 dB

aux in	<p>Auxiliary stereo input (mono-mixed), e.g. for CD player Cinch (RCA) sockets (left / right) and 3.5 mm stereo jack socket.</p> <p>Level control Min. input voltage: 2 x 250 mV (-14 dBV) Max. input voltage: 2 x 10 V (+20 dBV) Input impedance: 10 kΩ</p>
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Outputs

line out	<p>Unbalanced line output after master Mono jack, 1/4" (6.35 mm) Nominal output voltage: 1 V (0 dBV) Max. output voltage: 9 V (+19 dBV) Output impedance: 47 Ω Min. load impedance: 2 kΩ Residual noise (master fully anticlockwise): A-weighted: 1 μV (-120 dBV)</p>
headphones	<p>Headphones output Stereo jack, 1/4" (6.35 mm) Output power, 1 kHz, THD = 1%: Typ. 2 x 40 mW / 32 Ω Residual noise (master fully anticlockwise): A-weighted: 3.3 μV (-110 dBV)</p> <p>Warning: Suitable for headphones with stereo jack only. Do not connect any mono jacks.</p>

DI-out	<p>Balanced XLR output 1 = ground, 2 = positive (+), 3 = negative (-) Level control Nominal output voltage (differential), adjustment range: 41...410 mV (-28...-8 dBV) Output impedance: 47 Ω each terminal to ground Min. load impedance (differential): 1 kΩ Residual noise (both channels in line mode), A-weighted: 3.3 μV (-110 dBV)</p>
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Tone controls

channels 1 and 2	low	±12 dB at 100 Hz (shelf type)
	high	±13 dB at 10 kHz (shelf type)

Effects

Built-in effect	<p>Digital effect processor with 4 presets 1 = Reverb with short predelay 2 = Reverb with long predelay 3 = Repeating delay 4 = Chorus</p>
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Footswitch connector

footswitch	<p>Connector for a dual footswitch Stereo jack, 1/4" (6.35 mm) Tip = footswitch for muting channel 1 Ring = footswitch for muting channel 2 Sleeve = ground (common) Function: Switch ON = channel muted</p>
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Power

Supply voltage	24 V~, 0.5 A Use only supplied mains adapter.
Mains adapter	<p>Mains voltage: 100-240 V~ Power consumption when used with Dual Mix: max. 10 W</p>

General

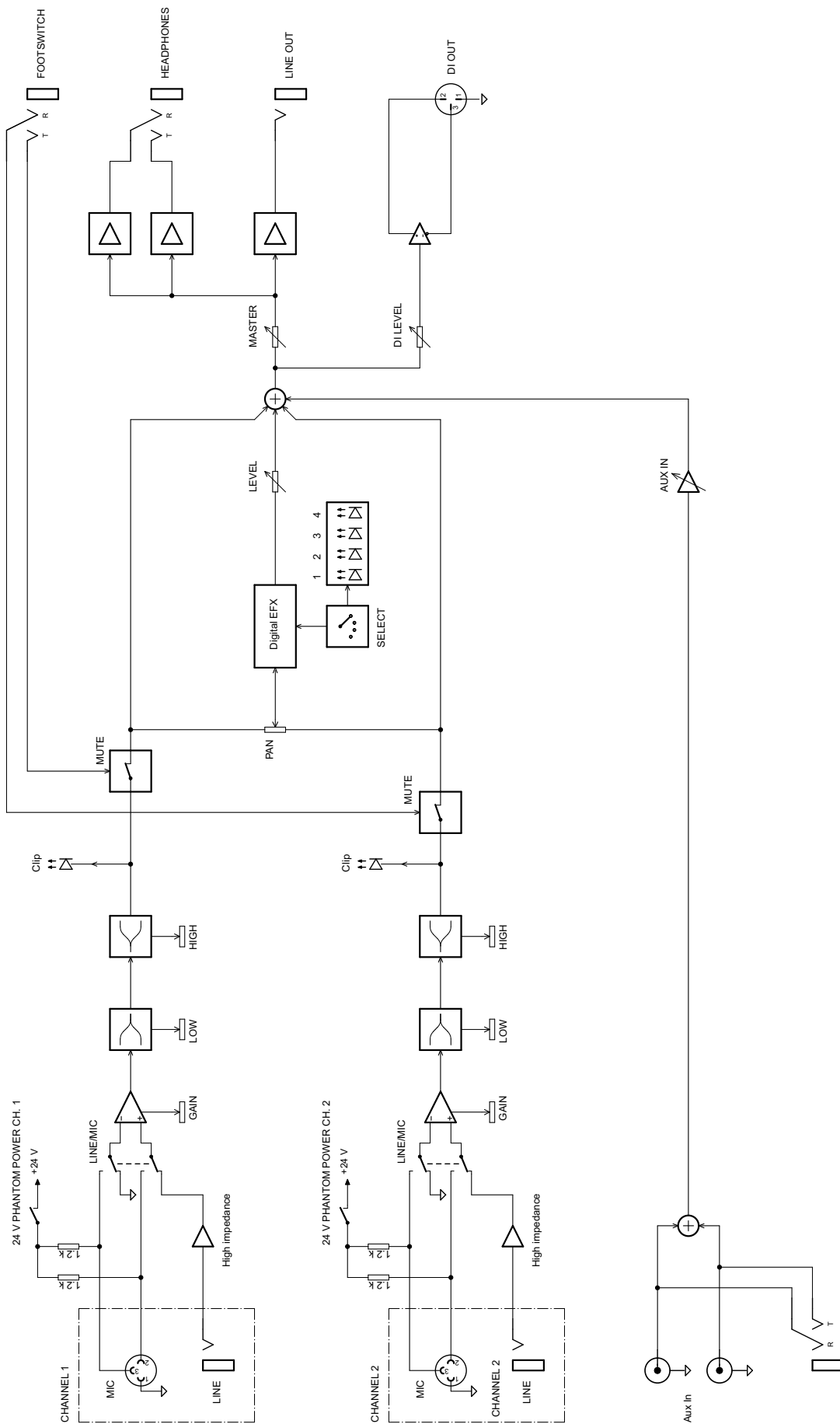
Metal housing	Aluminium
Finish	Anodized black
Dimensions	65 mm (2.56") high 105 mm (4.13") wide 135 mm (5.31") deep
Weight	480 g (1.06 lbs)

Definitions and conditions

Input and output voltages are RMS values for a sine signal and 1 kHz unless stated otherwise.
Tone controls in neutral position unless stated otherwise.
Min. input voltage: Input voltage for nominal output voltage at line out with gain and master fully clockwise.
Max. input voltage: Permissible input voltage that does not cause distortion more than the rated THD + N (assuming suitable control settings).
Signal-to-noise ratio (SNR): Ratio of nominal output voltage to noise voltage at line out, at specified gain setting, master fully clockwise, input shorted, 20 Hz...20 kHz.
Note: The SNR found at line out may be less than the SNRs specified for the channels because both channels contribute to the output noise.
Residual noise: Noise voltage at an output when all gain and level settings are minimal.
THD + N: Total harmonic distortion + noise for nominal output voltage at line out

Specifications and appearance subject to change without notice.

7. Circuit Diagram: pocket tools dual mix



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