



Instruction Manual
2023

EDB-2 VAP

Equaliser Direct Blender - Valve Alchemy Professional

**2 Channel Multi Function
Pre-amplifier, EQ D.I Blender
with Valve (tube) and analogue
Harmonic Enhancers**

Supremely versatile, pleasing
and trouble free Acoustic and
Orchestral amplification via
Pickups and Microphones



SUPERIOR ACOUSTIC AMPLIFICATION & CONTROL

Acoustic & Orchestral Pre-amplifier • Blender
Pro Audio Valve (Tube) • Equalisers • D.I
Anti-Feedback • 48v,10v & 5v Phantom Power
Dual Action Harmonic Enhancers • USB Charger

FX Loops & expanded routing options -

For Pickups & Stereo option Microphones via D.C Powering or Battery Backup

Suitable for stage and recording, EDB-2 VAP provides a transformative, beautifully voiced, yet practical problem solving solution to the diverse and critical needs for high end acoustic musical instrument amplification.

EDB-2 VAP offers a huge range of gain to interface signals weak or strong with mixers and other sound processors, with a unique range of features, including highly effective but simple interactive EQ and Notch Filters plus warmth and "quack" beating valve (tube) response other versatile facilities to get the best possible trouble-free sound from amplified acoustic stringed instruments, with ease.

01. Features

Customer led expanded features, now dual instrument/ player friendly, blended 2 stage Valve "Rich Harmonics" and analogue "High Harmonics",

Now allows blending across two channels from Stereo Jack In combined with Phantom Powering option. Also 3 Phantom voltages, extra D.I Outputs and Pre/Post EQ

EDB-2 VAP expands the appeal of the line from purely acoustic strings applications into the worlds of archtop guitars, jazz, blues, electric guitar and broad orchestral & folk instrument applications

- **H.E.A.T.** – Harmonic Enhanced Analogue Technology with tuneable added "Rich & High Harmonics"
- Improved Class "A" Inputs & lower noise Pro Audio Circuits voiced for clarity and warmth, producing a huge 32dB of Gain
- Twin Channels with 2 sets of 5 Band Interactive EQ & 2 quiet Mute switches
- Phantom Power to jack & XLRs: 48v, 11v & 5v
- Mono, Stereo and Balanced Inputs, with two XLR INs, enabling Stereo true Condenser Microphones to be powered via 2 Channels
- 3 way Input Impedance switches on each channel with separate Input Impedance on Ch.1 tip and ring
- Send / Return and Insert Point provide FX Loops for optimal connection of effects or tuner, separately via both channels
- "Range" rotary controls on each Channel provide a variable High Pass Filter, rolling off low frequencies to optimise low end response
- Tuneable Notch Filter on either channel to defeat feedback and resonances on either channel
- Phase Reverse and Earth Lift switches to correct phase imbalance, feedback and ground hum

- Highly versatile mono, stereo or blended outputs via Line Out jack and two Balanced D.I. XLR's
- USB Charger Socket for digital devices
- BBC Pro Audio design panel layout for contrast and easy reading
- DC Power Supply included (as standard) 100v~240v. Low noise design
- Pre-amplifier mounting option via bracket
- Aluminium Enclosure / Supplied as standard with leather (PU) chest bag
- Long life, heavy feel controls that stay in position
- Comprehensive printed manual
- Designed in UK ~ Made in Poland (EU)

Congratulations on your astute purchase

Please read this comprehensive manual carefully
before powering on the EDB-2 VAP.

Text is also available on website:

www.HEADWAYMUSICAUDIO.com

02. EDB-2 VAP PRINCIPLES

EDB-2 VAP is a Valve Pre-amplifier or Analogue Audio Signal Processor with multiple features, offering huge reserves of gain and headroom to interface with a wide range of other devices, while offering problem solving and sound quality enhancement, at low noise.

EDB -2 VAP shapes and equalises uneven tones, warms up sound, beats piezo "quack" & feedback, offers audible string separation, enables two sound sources to sit together and sound better, setting input impedances, applying Phase Reverse, or cancelling hum loops.

Devices to interface with include mixers, effects pedals and rack units, powered monitor speakers, headphone amps, combo amplifiers and power amplifiers.

EDB-2 VAP offers two uniquely developed analogue H.E.A.T "Harmonic Enhancer" features

High Harmonics are perceived as an "audio sparkle", which add "Even Harmonics" 1-1.5 octaves above 1 kHz. This may replace the frequencies not fully amplified by your pickup or microphone, or where strings are corroded and sounding dull

"Rich Harmonics" adds "Even Harmonics" from the Blend control with 2 stage Valve perceived as warmth, mainly to mid and low frequencies, with some additional high harmonics.

The Valve provides a slower response which smooths off transient peaks taking off the Piezo "quack" for a pleasant and natural sound

Re-start instantly and quietly using Standby and the Mute

EDB-2 VAP is small enough for convenient transportation and is supplied as standard with Headway leather (PU) chest bag

EDB-2 VAP

INSTRUCTION MANUAL NEW FOR 2023

Aims to achieve an optimum standard of effective, pleasing and trouble free acoustic amplification

EDB-2 VAP

**Equaliser Direct Blender ~ Valve Alchemy Professional
2 Channel Pre-amplifier & Harmonic Enhancers**

SUPERIOR ACOUSTIC AMPLIFICATION & CONTROL

**Acoustic Pre-Amplifier, Pro Audio Valve (Tube),
Equalisers, D.I, Anti-Feedback, Blender, 48v, 10v & 5v
Phantom Power, Dual Action Harmonic Enhancers,
USB Charger**

**FX Loops & expanded routing options - For Pickups
& Stereo option**

Microphones via D.C Powering or Battery Backup

**Suitable for stage and recording, EDB-2 VAP
provides a transformative, beautifully voiced, yet
practical problem solving solution to the diverse and
critical needs for high end acoustic musical
instrument amplification**

**EDB-2 VAP offers a huge range of gain to interface
signals weak or strong with mixers and other sound
processors, with a unique range of features,**

including highly effective but simple interactive EQ and Notch Filters plus warmth and “quack” beating valve (tube) response other versatile facilities to get the best possible trouble-free sound from amplified acoustic stringed instruments, with ease

FEATURES:

Customer led expanded features, now dual instrument/ player friendly, blended 2 stage Valve “Rich Harmonics” and analogue “High Harmonics”,

Now allows blending across two channels from Stereo Jack In combined with Phantom Powering option. Also 3 Phantom voltages, extra D.I Outputs and Pre/Post EQ

EDB-2 VAP expands the appeal of the line from purely acoustic strings applications into the worlds of archtop guitars, jazz, blues, electric guitar and broad orchestral & folk instrument applications

H.E.A.T. ~ Harmonic Enhanced Analogue Technology with tuneable added “Rich & High Harmonics”

Improved Class "A" Inputs & lower noise Pro Audio Circuits voiced for clarity and warmth, producing a huge 32dB of Gain

Twin Channels with 2 sets of 5 Band Interactive EQ & 2 quiet Mute switches

Phantom Power to jack & XLRs: 48v, 10v & 5v

Mono, Stereo and Balanced Inputs, with two XLR INs, enabling Stereo true Condenser Microphones to be powered via 2 Channels

3 way input impedance switches on each channel

Send / Return and Insert Point provide FX Loops for optimal connection of effects or tuner, separately via both channels

“Range” rotary controls on each Channel provide a variable High Pass Filter, rolling off low frequencies to optimise low end response

Tuneable Notch Filter on either channel to defeat feedback and resonances on either channel

Phase Reverse and Earth Lift switches to correct phase imbalance, feedback and ground hum

Highly versatile mono, stereo or blended outputs via Line Out jack and two Balanced D.I. XLRs

USB Charger Socket for digital devices

BBC Pro Audio design panel layout for contrast and easy reading

**DC Power Supply included (as standard) 100v-240v.
Low noise design**

Pre-amplifier mounting option via bracket

Aluminium Enclosure / Supplied as standard with leather (PU) chest bag

Long life, heavy feel controls that stay in position

Comprehensive printed manual

Designed in UK ~ Made in Poland (EU)

Congratulations on your astute purchase!

**Please read this comprehensive manual carefully
before powering on the EDB-2 VAP**

Text is also available on website:

www.headwaymusicaudio.com

EDB-2 VAP PRINCIPLES

EDB-2 VAP is a Valve Pre-amplifier or Analogue Audio Signal Processor with multiple features, offering huge reserves of gain and headroom to interface with a wide range of other devices, while offering problem solving and sound quality enhancement, at low noise

EDB -2 VAP shapes and equalises uneven tones, warms up sound, beats piezo “quack” & feedback, offers audible string separation, enables two sound sources to sit together and sound better, setting input impedances, applying Phase Reverse, or cancelling hum loops

Devices to interface with include mixers, effects pedals and rack units, powered monitor speakers, headphone amps, combo amplifiers and power amplifiers

EDB-2 VAP offers two uniquely developed analogue H.E.A.T “Harmonic Enhancer” features
High Harmonics are perceived as an “audio sparkle”, which add “Even Harmonics” 1-1.5 octaves above 1 kHz. This may replace the frequencies not fully amplified by your pickup or microphone, or where strings are corroded and sounding dull

“Rich Harmonics” adds “Even Harmonics” from the Blend control with 2 stage Valve perceived as warmth, mainly to mid and low frequencies, with some additional

high harmonics. The Valve provides a slower electrical response which smooths off transient peaks taking off the Piezo “quack” for a pleasant and natural sound

Re-start instantly and quietly using Standby and the Mute

EDB-2 VAP is small enough for convenient transportation and is supplied as standard with Headway leather (PU) chest bag

CAUTION / Mis-Use: Will not operate, may be inconsistent or could cause damage with use of incorrect DC Power Supply. See Electrical Specifications 19.2
EDB-2 VAP should be trialed and generally operated via the supplied D.C Power Supply Unit

Contact with rain or liquids are likely to incur damage

Handle EDB-2 VAP with care. Fragile internal Valve. Do NOT drop or throw

Without additional suitable equipment EDB-2 VAP will not drive speakers, headphones or produce it's own sound

Will NOT accept a Power Amp into the jack or XLR sockets as would be damaged

CONTENTS OF EDB-2 VAP RETAIL PACKAGING BOX:

Multi Function Pre-amplifier

D.C Power Supply Unit (as standard) with mains plug type according to dealer territory



Leather(PU) Chest Bag with Headway logo for hands free transportation



Instruction Manual

Guarantee Card & ((HEADWAY)) Logo Stickers. Please apply stickers to instrument cases etc

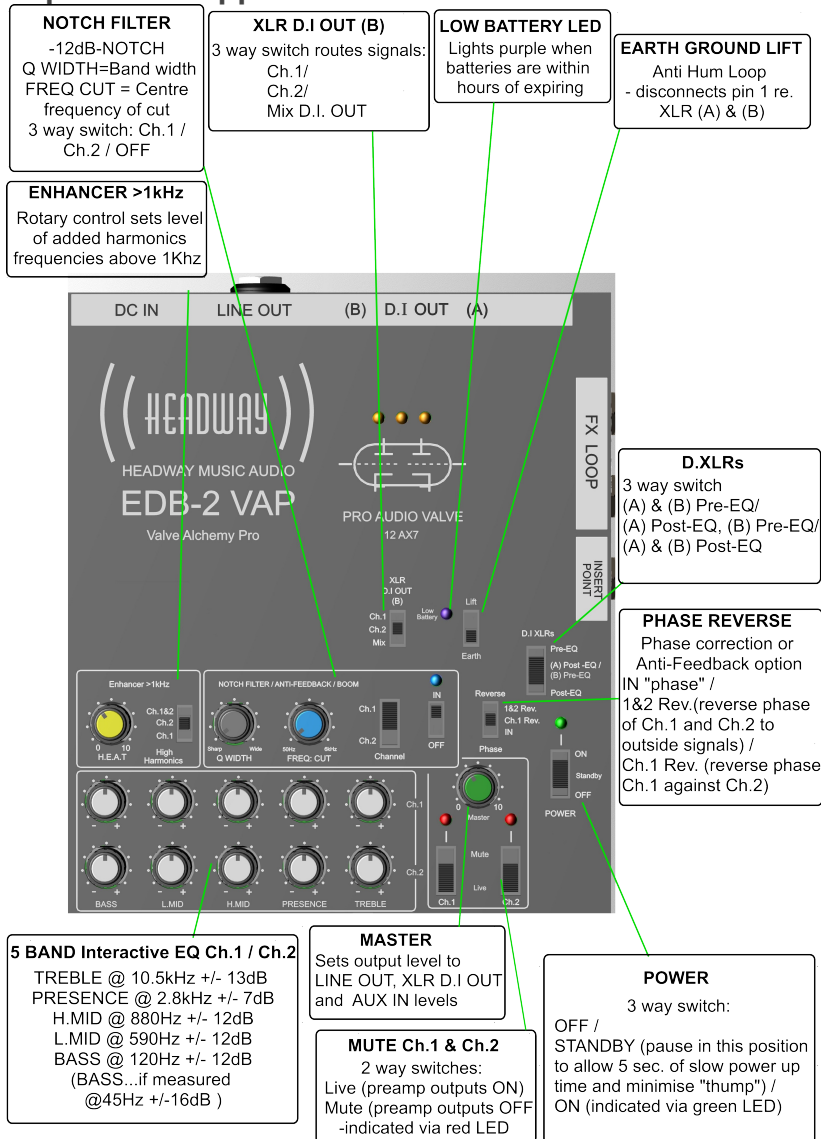
TABLE OF CONTENTS

- 1.0 SAFETY PRECAUTIONS & OPERATION**
 - 1.1 IMPORTANT SAFEGUARDS**
 - 1.2-1.6 SERVICING, REPAIRS, RETURNS & LEGAL**
 - 1.7 WARRANTY / GUARANTEE TERMS**
 - 1.8 STORAGE & TRANSPORT**
- 2.0 EDB-2 VAP - POWER ON**
- 3.0 PICKUPS AND MICROPHONES TO INTERFACE**
 - 3.1 IMPEDANCE SWITCHES**
 - 3.2 LEAD / CABLE NOTES**
- 4.0 CH.1. JACK INPUT**
- 5.0 MUTE / LIVE SWITCHES ON Ch.1 & 2**
- 6.0 ROTARY POT CONTROLS**
 - 6.1 GAIN CONTROLS**
 - 6.2 GAIN & MASTER - JOINT OPERATION**
 - 6.3 5 BAND INTERACTIVE EQ - Ch.1 & 2**
 - 6.3.5. PRE-POST EQ SWITCH: D.I XLR OUTS**
- 7.0 HARMONIC ENHANCER - H.E.A.T :**
 - 7.1 “HIGH” ENHANCER ~ analogue**
 - 7.2 “RICH” ENHANCER ~ VALVE**
- 8.0 Ch. 2 / STEREO IN / XLRs & MICROPHONES**
- 9.0 PHANTOM POWER**
- 10.0 NOTCH FILTER – ANTI-FEEDBACK / BOOM**
- 11.0 RANGE CONTROLS - ANTI-FEEDBACK / HIGH PASS FILTER**
- 12.0 PHASE REVERSE - ANTI-FEEDBACK**
- 13.0 SEND & RETURN - FX LOOP & INSERT POINT**

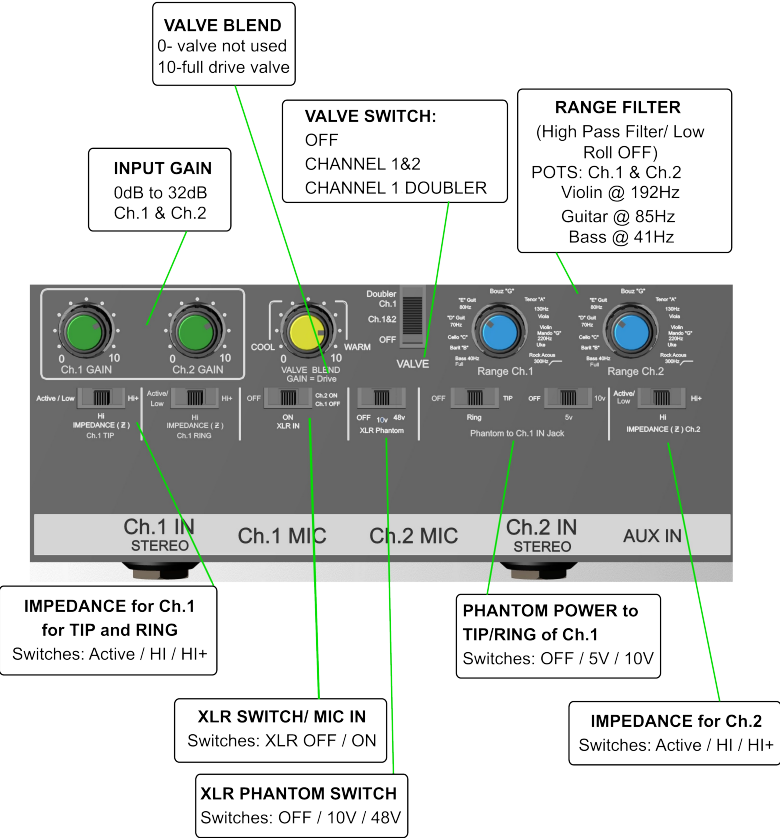
14.0 AUXILIARY (AUX) IN
15.0 MASTER VOLUME
16.0 OUTPUTS
16.1 ANALOGUE OUTPUTS - “LINE OUT” JACK
SOCKET
16.2 D.I. SOCKETS - XLRs x 2
17.0 USB CHARGER - DIGITAL DEVICES
18.0 POWERING -
18.1 POWER SUPPLY UNIT (DC)
18.2 BATTERY BACKUP
19.0 SPECIFICATIONS
19.1 PHYSICAL SPECIFICATIONS
19.2 ELECTRICAL SPECIFICATIONS
20.0 TROUBLE SHOOTER CHECKLIST
21.0 HEADWAY PRODUCTS
22.0 POLICY OF CONTINUAL IMPROVEMENT

EDB-2 VAP FEATURES DIAGRAM -

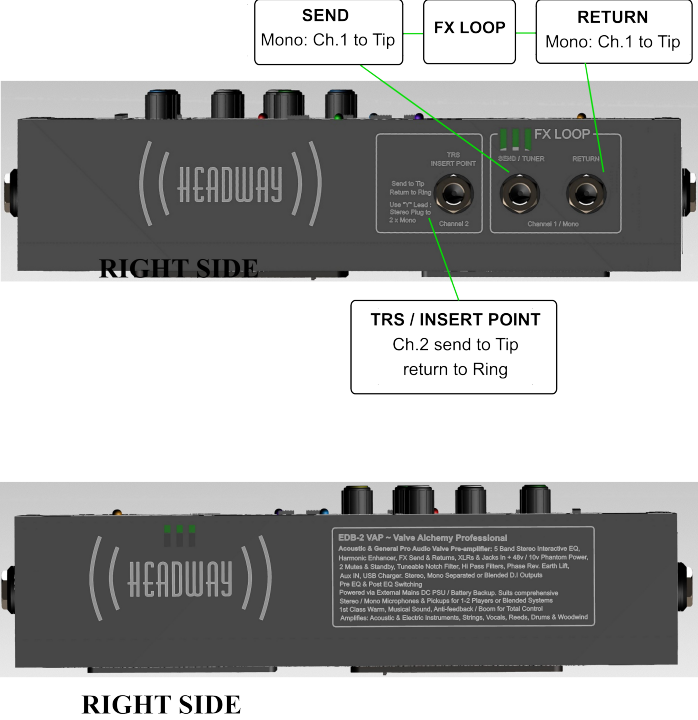
Top Panel – Upper Front Panel Section



Top Panel – Lower Front Panel Section

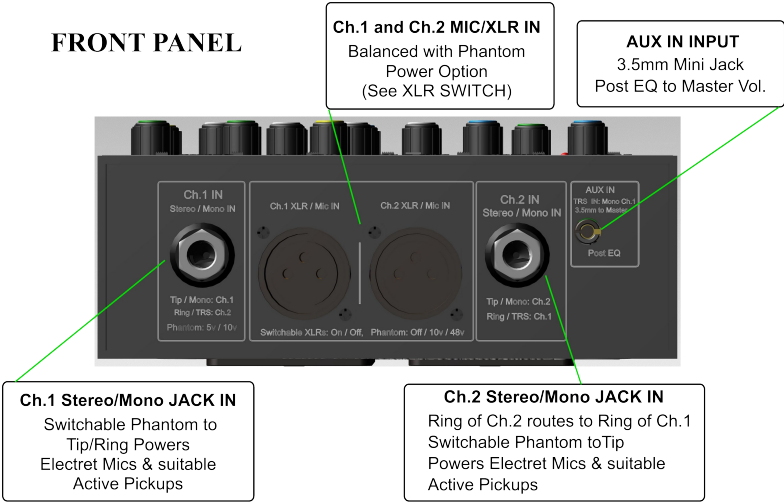


Side Panel

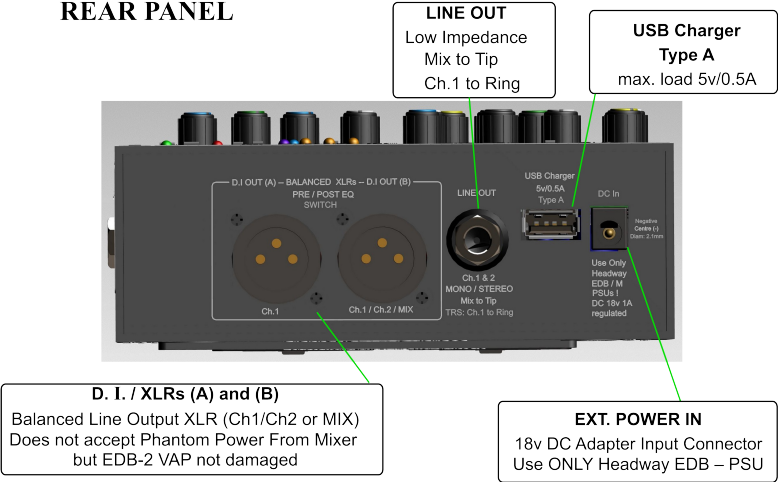


Front/Rear Panel

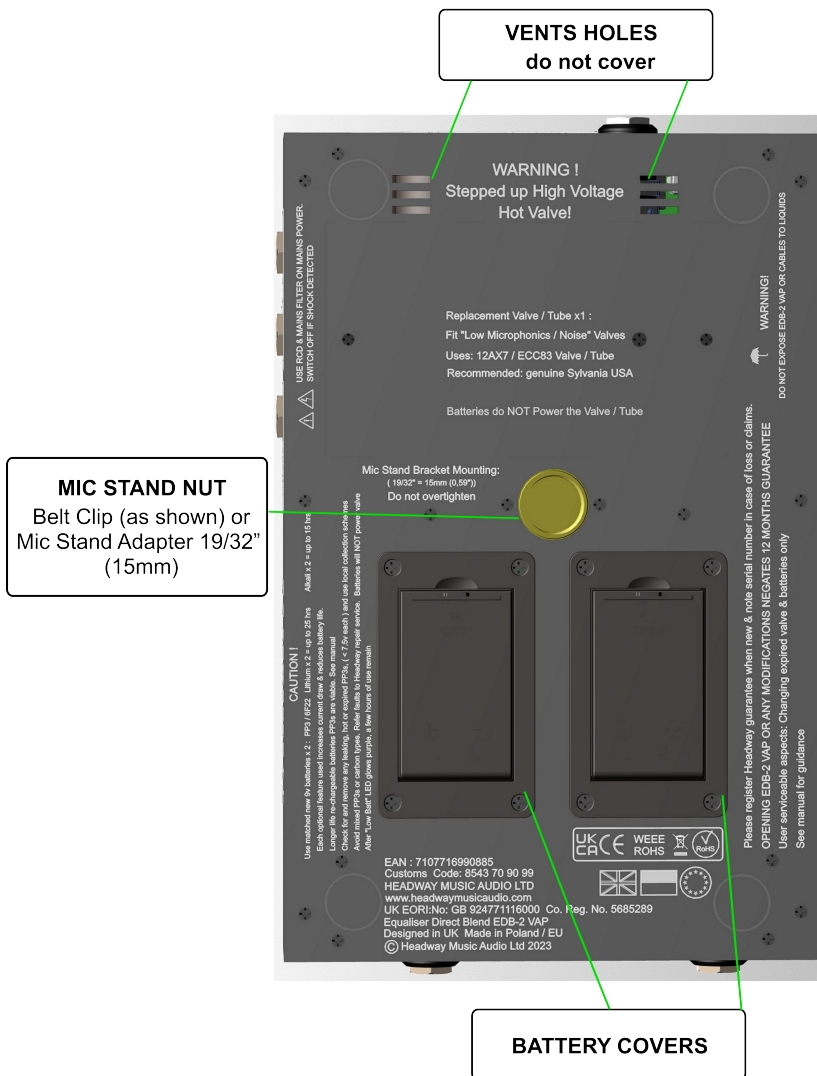
FRONT PANEL



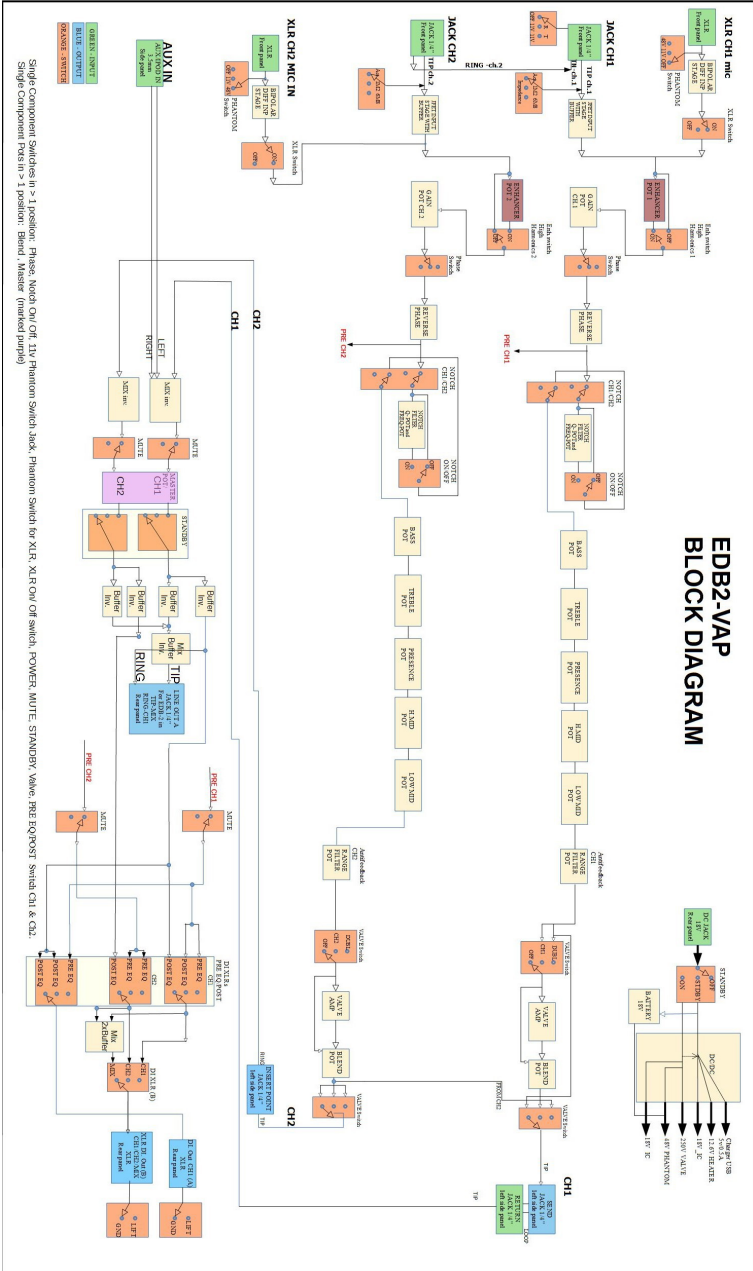
REAR PANEL



EDB-2 VAP Bottom Panel



EDB2-VAP BLOCK DIAGRAM



Please read all warnings on Headway EDB-2 VAP very carefully

1.0 SAFETY PRECAUTIONS & OPERATION

1.1 IMPORTANT SAFEGUARDS to your life and gear to note before use of your EDB-2 VAP

IMPORTANT: Power only by Headway EDB/VAP PSU version supplied. Or PP3

(9v) batteries x 2 for backup operation. Batteries will NOT power valve or USB Charger

DANGER! DO NOT OPEN/ DISASSEMBLE EDB-2 VAP UNLESS YOU ARE AN ACCREDITED ELECTRONICS TECHNICIAN AND YOU HAVE BEEN SPECIFICALLY AUTHORISED IN ADVANCE TO DO SO BY HEADWAY MUSIC AUDIO LTD

User Serviceable parts on EDB-2 VAP: Only 12AX7 Valve under it's cover, PP3 batteries and the knobs pushed onto pots (rotary controls). You may use "Switch Cleaner with Lubricant" from outside of metal enclosure on moving parts

BEWARE! - HIGH VOLTAGES IN PROXIMITY TO VALVE ! (TUBE). Do NOT open the Valve cover unless changing the valve. Ensure Power is OFF and unplug Power Supply Unit and allow Valve to cool

down for at least 3 minutes and do NOT touch metal terminals in case of a capacitive electric shock

POWER SUPPLY UNIT - DC Adapter Mains Plug Connector Types available for EDB-2 VAP. See 18.1 Power Supply Unit

1.1.2 EARTH PROTECTION & GROUNDING - To prevent electric shock, ensure that any Input/Output cables from EDB-2 VAP are connected to amplification or signal processing devices (e.g. mixers) with a continuous, unbroken chain of mains earth connection. Try to ensure that the mains supply at the venue offers a viable earth / ground connection. DO NOT disconnect any ground / earth wire on a mains powered device, mains distributor/extension lead, or wall socket

1.1.3 MAINS PROTECTION - Always take care to protect your own life and those of others along with your equipment by using RCD circuit breakers and AC mains surge protectors at each source of the mains power. Circuit breakers should be tested prior to use. Headway recommends the use of mains noise filters

Switch Off D.C Power Supply Unit and other connected mains powered devices and unplug when EDB-2 VAP is not in use

1.1.4 PREVENTION OF SHOCKS & DAMAGE - Do Not expose the EDB-2 VAP, its Power Supply Unit or attached devices to any liquids, such as rain/spilt drinks. If your EDB-2 VAP should come in contact with any liquids, switch off at mains power socket, disconnect and dry EDB-2 VAP and hands before reuse

SHOCKS WARNING - Switch off any sound equipment immediately, when even minor electric shocks are detected and seek a practical consultation from a qualified professional electronics repair technician. The use of radio microphones and their transmitters will limit the likelihood of shocks. Use government type approved radio microphones on their allocated frequencies

1.1.5 VENUE WARNING - Avoid venues with suspect electrical wiring, damp or wet wires and/or contacts or where sparks are visible

1.1.6 CABLE & AMP PLACEMENT WARNING - Always place your EDB-2 VAP and associated cables where they are visible such as via Mic Stand bracket to avoid hazard

1.2 SERVICING, REPAIR, RETURNS & LEGAL: All
Headway servicing and repairs should be carried out by Headway Music Audio Ltd. or any approved agents where applicable. Headway is not responsible for damage incurred by unauthorised or non approved repairs. Any attempt to disassemble EDB-2 VAP without prior permission would negate the 12 Month guarantee. Only the 12AX7 Valve (tube) and PP3 batteries or plastic knobs are user serviceable parts

All returns must be sent pre-paid and any insurance taken against loss is sender responsibility.

Headway will NOT be held responsible for losses in transit or for duty and taxes incurred. (e.g. where customs documentation is completed incorrectly)

Customs Declaration forms on returned products sent internationally, should be completed and could read, for example:

"Electrical Audio Amplifier returned to Country of landed origin (Poland or UK) for Service/Repair. Not for Re-sale. e.g. value for Customs = \$ 39 ?

Customs Classification & Code - HS: 8518.10.40 . Unit will be returned to sender"

If returning product for repair/service you must include: Your full contact details including name, phone number, full mailing address, email addresses

and a full description of any problems. If claiming under Guarantee/Warranty you must also include: Proof of purchase clearly indicating date, business name and address of dealers who sold the product when new. See Storage & Transport 1.8

1.3 CLEANING EXTERIOR OF EDB-2 VAP: Ensure pre-amp is unplugged before cleaning with a slightly moist cloth. Do not allow moisture to enter unit and do not use chemical or abrasive cleaning products. Do NOT allow moisture or liquids onto valve or internal parts

1.4 PRODUCT LIABILITY: Headway Music Audio Ltd will not be held responsible for damage to its products caused by the subjection to unreasonably high or low temperatures or due to wet conditions or for abuse or mishandling. Headway Music Audio Ltd. retains the right to make all such determinations according to its own inspection

1.5 CONSEQUENTIAL LOSS: Headway Music Audio Ltd will not be responsible for consequential loss or damages such as due to the use or misuse of its products, accident, neglect, technical modifications or unreasonable expectations. Headway Music Audio Ltd will not be held responsible for the application of phantom power where some other electronic device may have been damaged. Headway Music Audio Ltd

retains the right to make all such determinations from its own inspection

1.6 PERSONAL INJURIES: Headway Music Audio Ltd will not be held responsible for personal injuries or damages related to its products such as those caused by heat, fire, obstruction, modifications or electrical shock where obtained due to a lack of care on the part of the injured party or due to that person's ignorance of the instruction manual or due to that person's ignorance of best practices in the use of mains powered facilities. Headway Music Audio Ltd retains the right to make any such determinations according to its own inspection

1.7 WARRANTY/GUARANTEE TERMS: Headway guarantees the EDB-2 VAP for up to but no longer than 12 months from the date of purchase. This is valid only after the guarantee registration has been made online at:

www.headwaymusicaudio.com

All guarantee issues will be subject to assessment by Headway and appointed service agents. Headway Music Audio Ltd does not recognise or participate within guarantees/warranties offered by third party companies such as retailers / dealers

WHAT IS COVERED: Headway Music Audio Ltd cover labour and parts required for all actively functioning aspects of the amplifier, subject to Customer Guarantee Registration and customer retention of proof of purchase, indicating date, business name and address of supplier

WHAT IS NOT COVERED: Shipping and packing related, handling or customs, tax & duty charges, physical damage and cosmetic blemishes, electrical, electronic or audio problems if caused by misuse or heavy handling. Non – registered guarantees, partly completed registrations, expired guarantee periods or 3rd party company issue guarantees

WHAT IF I HAVE NOT REGISTERED GUARANTEE ?:
Retail customers having purchased direct from Headway Music Audio Ltd are covered by the 12 Month Guarantee regardless of registration

If you have not registered the guarantee you retain your statutory rights under consumer law of the country in which you made the purchase and your contract is with the dealer/retailer

1.8 STORAGE & TRANSPORT ADVICE - Headway Music Audio Ltd suggests storing and transporting the EDB-2 VAP inside a polythene bag in a heavy, double

thickness cardboard box in good condition or the original packaging. Any container should be padded out in order to prevent the unit from shifting around during transit. We recommend using postal services or Fedex shipping with batteries: Warning! - Lithium batteries, Rechargeables and spent batteries are now banned from all international and some domestic shipping and could result in a return to sender or disposal of unit. The battery shipping rules and regulations keep changing so please check with the shipping organisation. If in doubt, remove batteries before shipping

2.0 EDB-2 VAP POWER ON

ORDER OF CONNECTION FOR QUIETEST POWER ON

- i) Apply Mute switches
- ii) Connect EDB-2 VAP output lead(s) to mixer or other device(s)
- iii) Connect lead(s) into guitars or other instrument(s)
- iv) Power EDB-2 VAP On via Power switch to Standby (Plug in Headway DC Power Supply Unit to override batteries)
- v) After 7-8 seconds, switch Power from Standby to ON
- vi) Connect input lead(s) to EDB-2 VAP
- vii) Set Mute(s) to “Live”

If you must pull a lead out while connected live, unplug the jack from the preamplifier, NOT from the instrument, to keep noise down

Ensure switches are not left between settings which may short out operation until moved into a positive position

EDB-2 VAP features a new 10 second Slow Power On" to further cut "plug in" noises while connected live.

Switchcraft, Neutrik, Deltron & GH offer quieter switching jack plugs

3.0 PICKUPS & MICROPHONES TO INTERFACE

EDB-2 VAP can be used with all the main types of microphone and/or pickups, whether active (powered by battery or phantom), or passive (non powered)



i) Active (powered) piezo under saddle pickup systems (e.g. HE5/G.FEQ, or Snake3AG pictured

above, or forthcoming Headway "Superbug" - Low impedance output with Fixed EQ according to instrument model). These pickups are among the least prone to feedback and body noises



Ebony floating bridge for archtop guitar – pictured here routed for piezo cable pickup entering from inside guitar, showing maple tongue to pressure pickup

ii) **Passive piezo cable or co-axial cable under saddle pickups (e.g. Headway HE5 Passive** - Ultra high impedance output that requires a short, high quality lead into a high impedance input such as EDB-2 H.E, EDM-1 H.E or EDB-2 VAP



iii) **Headway's The Band & Band2"** as pictured on violin above. "The Band" is a popular, easy fit, strap around bowed stringed instrument contact pickup with high impedance output. "The Band2" is the latest tonal upgrade version



iv) **Active Magnetic Sound-hole Pickup - low impedance output (Headway SAM-1 pictured above)**
These types of pickups are generally the least prone to feedback SAM-1 carries pre-EQ and Harmonic Enhancer.



Other active magnetic sound-hole pickups typically require a lot of EQ and may still sound “mellow” or “boxy” and would benefit from high and rich harmonics via H.E.A.T Enhancer

v) **Active piezo contact pickups** - (e.g. forthcoming **Headway “SuperBug”** - low impedance output) These should be less prone to feedback than passive contact pickups and a lot less prone than microphones



vi) **Transducers or contact pickups** - high Impedance (e.g. Headway Passive Contact Pickup) **Headway - PCP-2 or PCP-3**, pictured above. These should be less prone to feedback than microphones 5-10 megohms $M\Omega$ optimum

vii) **Passive piezo ceramic - Under saddle fitting** - high impedance 5-10 megohms $M\Omega$ optimum

viii) **Passive flexible “piezo film” contact pickups** or under saddle transducer (may be encased in rigid metal) - Ultra high impedance. 10-20 megohms $M\Omega$ optimum

ix) **Passive Magnetic Sound-hole Pickups** - Low to mid impedance normally fairly proof against feedback. A traditional mellow sound might be optimum at about 800 Ohms to 1 megohm. However a brighter sound may be preferable. This is optimum at about 5-8 megohms MΩ optimum

x) **Silicone condenser microphones** or MEMS include analogue output miniature microphones often incorporated in digital devices. Not unrelated to electret condenser mics they exhibit a superior performance, comparable with miniature true condenser microphones. They run on very low voltages from their own power supplies and exhibit exceptionally wider and flatter frequency responses, high sensitivity, tolerance to higher sound pressure levels, with exceptionally low noise and distortion at a very low power consumption and at reasonably lower cost

Headway plans a range of silicone condenser microphones branded as “**MicroPure**”, featuring integral pre-amplifiers and powering

xi) **True condenser or ribbon microphones** - Run optimally at 48v from EDB-2 VAP or most mixers via XLR connections. They deliver high quality amplification at

low stage volume levels without problems

xii) Electret condenser microphones - Operate at low voltages via batteries or on low phantom power voltages usually between about 5v-11v. The sound quality is normally considerably lower than with true condenser microphones or MEMS, but may be powered by EDB-2 VAP or by EDM-1 H.E, EDB-2 H.E, using 9v-11v phantom to stereo jack plugs. These are the type of miniature microphone normally included with Non-Headway pickup systems. Check voltage requirements and whether tip or ring wiring is required. Beware that 48v is likely to damage them



Adrian Edmondson "The Bad Shepherds" & "Bad News"

xiii) **Dynamic microphones** - Include the popular Shure SM57 or some miniature microphones and may connect via XLR or jack but do not require powering and are not damaged by phantom power. They are often tough and reliable but not terribly sensitive and have an uneven frequency response. They usually benefit from treble

boosts and mid cuts. Most are for external use on stands. Miniature versions are often used primarily for drums, brass or woodwind

3.1 IMPEDANCE SWITCHES - Ch.1 & Ch.2.

Located on top of EDB-2 VAP near the start of the signal chain

Input impedance 3 way switches make a subtle difference to tone and response, but with least effect for active pickups. They apply to jack inputs only

Ch.1 - Tip and Ring connectors on Ch.1 jack IN each have their own independent input impedance switches

Ch.2 - Input Impedance switch offers three optimum settings to Tip if Stereo jack or if Mono jack plug are used.

Ch.2 - Should Stereo jack plug be used, Ring connection is set by the Input Impedance Ring setting for Ch.1, in absence of a jack plug inserted into Ch.1 jack socket

Microphone inputs have fixed impedances which are not affected by the Impedance switch. See: 3.1.4 and Electrical Specifications 19.2

3.11 +HI - ULTRA High Impedance Input: < 20 Meg Ohms

This setting sets the input to be uniquely optimised for ultra high impedance passive, non-powered pickups directly into EDB-2 VAP

The primary types of pickups optimal for +Hi include piezo cable or co-axial cable passive pickups (Headway HE5 Passive), or flexible “piezo film” pickups as offered by a number of manufacturers. Most are flexible structure types, but some film pickups are encased in rigid metal

A very high standard of shielding is required with the cable as short as is possible. Suitable cable should have at least 80% screening, preferably braided or conductive plastic shielding plus extensive lapped wire screening

3.1.2 HI - HIGH Impedance Input: < 6.8 Meg Ohms

This setting sets the input to be optimised for commonly available passive under saddle ceramic piezo pickups or contact/bug pickups and Headway's The Band2 (for bowed instruments). It offers a bright sound for passive magnetic sound hole pickups Lead lengths for the Hi impedance input setting are best kept as short as is reasonably possible and with good screening, but no more than 6m (18')

3.1.3 ACTIVE-LOW Impedance < 1 Meg Ohm

This input is optimised for active pickup systems, as require battery power, or at line level. It is also used for some passive /low impedance pickups, but on passive pickups there will be a treble roll-off and hence a mellower, more middle biased sound. input leads carrying active signals are not so sensitive to shielding quality or cable length, so leads up to 10m (33') in length are no problem

3.1.4 MIC INPUT XLRs CHANNEL 1 and 2 - Impedance < 3.4k Ohm. XLR input accepts dynamic, ribbon, condenser, silicon condenser and electret condenser microphones, with On/Off Switch and phantom power (48v & 10v). See: Microphone Inputs 8.1.2

3.2 INPUT CABLE / LEADS NOTES

Suitable jack leads as used to the Input of the EDB-2 VAP should have at least 80% screening, preferably braid shielded (not to be confused with woven braided jacket outer) or, at least, conductive plastic shielding with extra extensive lapped screening to minimise hum and radio interference

Denmark can have a particular problem with hum when using mains electricity to run a sound system. This is

because there is no mains earth, therefore everything has to be exceptionally well shielded, particularly at high impedance

3.2.1 LEADS FOR PASSIVE PICKUPS - For the highest impedance passive pickups such as piezo cable or film pickups, we recommend using cables 2m (6') max. of standard quality (e.g. Klotz or Van Damme), and 3m (9') of low capacitance cable, (e.g. Sommer Cable) into pre-amp input

Headway offers **Sommer Cable jack leads** with quality lightweight jack plugs

For high impedance passive piezo pickups, such as piezo ceramic or Headway's popular "The Band2", we recommend the use of quality cables of 3-5m (9'-15') max. to EDB-2 VAP

For lower impedance magnetic passive pickups and dynamic microphones, a max. of 6m is recommended, but shorter leads are preferable and low capacitance leads are the gold standard

3.2.2 LEADS FOR ACTIVE PICKUPS - Quality active (powered) pickup systems of all types are least affected, but are not unaffected by lead length and quality. A maximum of 10m (33') is recommended. For lengths exceeding 10m ensure use of balanced cables

3.2.3 OUTPUT / BALANCED XLR D.I - Running a balanced signal greatly extend effective lead lengths possible without noise build up, making cable quality less critical for noise

4.0 CH.1. JACK INPUT (Stereo 1/4" / 6.35mm diam.)

Located on front end.

EDB-2 VAP mixes Stereo Inputs to Jack IN on Ch.1 or Ch.2, across both channels, while accepting Phantom Power to Ch.1 and Ch.2 Jack In

Accepts active and passive pickups, dynamic, ribbon and electret condenser microphones. The Stereo (TRS - Tip / Ring / Sleeve) socket is configured for standard mono to Ch.1 or stereo jack plug inputs routing between Ch.1 and Ch.2.

TRS socket allows blending of two signals where Ring is routed to Channel 2, also the option of Phantom Power on 1 contact at 5v or 10v via a 3 way slider switch on top. Input impedance may now be set separately to Tip and Ring via two 3 way switches on top.

See: Pickups & Microphones to interface 3.0,
Ch.2 / Stereo IN and XLR Microphones 8.0, Phantom Power 9.0

WARNING! - Plugging a live power amp output into EDB-2 VAP would likely damage the unit and negate the Guarantee / Warranty

5.0 MUTE/ LIVE SWITCHES ON Ch.1 & Ch.2

Located on top

Mute position with red LED illuminated indicates that output is off on the Channel. They are useful for silent tuning in front of audience, to switch off during periods of inactivity without re-setting controls, or prevent annoying howl sound/feedback. The two Mute switches enable easy instrument swapping and quieter plugging/unplugging when live

6.0 ROTARY POT CONTROLS

Located on top

ACW = Backing a knob off (left) or turning it

Anti-Clockwise

CW = Turning a knob up (right) or turning it Clockwise

6.1 GAIN CONTROLS (Ch. 1 & 2: 0dB-32dB Gain)

Graduated 0-10 Green knobs x 2 - Located on top

Now mixes Stereo Inputs to Jack IN on Ch.1 or Ch.2, across both channels, while accepting Phantom Power to Ch.1 or Ch.2 Jack In

Turn rotary control pot CW to increase the gain. Each dot marker equals 2.5dB (approx.) or +/- 40% and it increases on a log scale, which is more steeply than on a linear scale

Control on maximum "10" provides gain of 31-32dB (x 5 approx.) which is far greater than should normally be required

Start at around "2-3" or 1/4-1/3 CW up from zero and adjust to taste, listening to the level/desired volume Valve (Tube) is driven from Gain control, then Blend control, so when switched on to the channel, higher gain will drive the valve harder. Valve Blend control is a balance between dry signal and valve, so turning up CW will drive valve harder

NOISE NOTES:

EDB-2 VAP is a multi-function device which may run most features on batteries. EDB-2 VAP offers a battery backup since battery life is reduced compared to EDB-2

H.E. The battery option will not power the Valve (tube). Despite the constraints of designing EDB-2 VAP with multiple functions and to include battery use, the device operates at the lowest possible noise levels and has achieved a low noise performance

EDB-2 VAP is neither a purely mains powered unit, a limited single function device, or a digital software, so some small amount of noise is inevitably generated from the over 700 components connected in line

Noise levels usually increase as gain levels are boosted but may or may not be noticeable. A higher output from EDB-2 VAP may require running subsequent devices in the chain with less gain to produce less noise from those later stages and lowest overall noise. Every electronic device produces some noise during operation

Noise Reduction - If some residual hiss or hum is detectable, it should be assessed while everything is connected live, while there is no signal from playing. It may then be targeted & notched down for recording

The valve will add some hum as it is in the nature of the device, but noise has been kept to a minimum and its pleasure giving audio effects are usually seen as well worth any additional noise

Valves can also be susceptible to microphonic, percussive noises picked up through the enclosure. EDB-2 VAP is designed to minimise these effects, which are further reduced by fitting the low noise versions of the valve, as provided when new

WARNING!: SOME LOWER COST 12AX7 VALVES WILL INCREASE NOISE / MICROPHONICS LEVELS AND IT MAY NOT LAST AS LONG

EDB-2 VAP offers an exceptional feature in that it may still be operated without a working valve installed, or by switching or blending it out

To reduce residual noise further and cut battery consumption, turn off features not in use e.g. XLR In, Harmonic Enhancer, Phantom Power to jack In, Phantom to XLR In, valve, Notch Filter, Phase Reverse. Also, to reduce noise further, turn down valve, Harmonic Enhancer and/or treble control

6.2 GAIN & MASTER - JOINT OPERATION

Method “A”. After plugging Jack or XLR in to Input at a Gain of "0" with Mute ON, turn Master up to about 2/3 CW or 2 o'clock, then switch Mute Off & gradually turn Ch.1 (or Ch.2) Gain control CW slowly, until you have reached the desired level at 1/4-1/3 CW. Adjust Gain control carefully according to desired levels

Method "B". After plugging in at a Gain of "0" and with Mute ON, switch Mute OFF and turn Master up a little maybe 1/4-1/3 CW, then gradually increase the Gain CW to maybe 1/2-2/3 CW or about 2 o'clock, until the desired level (for your instrument) is reached. Further adjust Gain and Master in order to retain headroom and clarity

Master controls the overall volume

Method "B". Offers a slightly lower noise level, while Method "A" may offer a slightly clearer or more pleasing tone and is recommended .

Why No Level LEDs? Distortion is something that happens progressively and there is no black and white point to mark a change over from clean to distorted. Levels and distortion change according to factors such as how hard you play and the user should decide how clean, how warmed up, or how (slightly) distorted they would like the sound to be and it will change in as little as one second to the next. A red warning LED will not change this. Instead, use your ears!

6.3 5 BAND INTERACTIVE EQ - Ch.1 & Ch.2

White knobs in two rows of five - Located on top

Baxendall Interactive & Musical Sounding EQ

Each dot marker equals 2.5dB (approx.) or +/- 40%

EDB-2 VAP offers two sets of 5 Band EQ by popular demand to offer maximum flexibility in shaping the sound of two sources via two channels for input from both pickups and/or microphones

6.3.1 TYPICAL EQ REQUIREMENTS

Steel strung acoustic guitar, bouzouki, octave mandola and acoustic bass often require a mid range cut, especially when playing full chords. Headway HE5 & Snake3 Fixed EQ pickups require less EQ because they incorporate an active tone section, which is set for the instrument type specified on the pickup model (e.g Headway HE5/G.FEQ for High End Acoustic Guitar - Fixed EQ)

Nylon strung guitars played finger style, maccaferri or resophonic guitars usually require flat mid range EQ or maybe with a slight boost unless they are played with mainly full chords, in which case some mid cut may be preferable

Violins and mandolins often require treble cuts and low end cut below 200Hz, as offered on EDB-2 VAP range switch

Violins also often benefit from upper mid cuts

Many electret and condenser microphones carry an in built presence or treble boost, which you may wish to cut for instruments via EQ controls?

Dynamic microphones usually benefit from a treble boost and often some mid cut

6.3.2 BOOSTING EQ : The EDB-2 VAP offers active boost as well as cut on its EQ controls. However, boost functions can only work effectively if there is a significant amount of the frequency already there in order to be able to increase it.

The Harmonic Enhancer can apply high end content above 1 kHz that would otherwise not be present. Fine tune, cut or boost via the use of the Treble and Presence Control

For critical applications, EQ is generally thought to sound better where cut rather than boosted

6.3.3 WHAT DETERMINES TONE? - There are a lot of interactive influences. They include reflectiveness and brightness of the room, what fixtures, fittings and people are in it, the size of the space, the instrument type and every aspect of its construction and playing and the amplification gear. EQ can compensate for a lot of these influences

6.3.4 EQ CONTROLS - ROTARY POTS

Located on top

The Notch Filter and Range Switch settings can all overlap with Bass, Low Mid and High Mid

i) BASS CONTROL: +/- 12dB centred broadly, approximately @ 120Hz, or +/- 16dB if measured @ 45Hz....(and before you ask, YES, these figures are both correct!) Allows control of the bass at the lowest frequency of the audio spectrum and will overlap a little tonally with Low Mid control

Controls the lowest frequency of the audio spectrum. Cut Bass ACW to cut body handling noise, boomy sounds, externally generated hum, percussive clunks and low end feedback as well as any instrument bias towards the low strings

Increase Bass CW to beef-up tone or bias lower strings more strongly. High strings will produce some lower tones or sub-harmonics which will be enhanced or reduced by the Bass control for a more sharply focussed Bass cut, use the Range control pots. The Notch Filter may also be used to reduce excessive low thumps from some contact pickups or microphones

ii) LOW MID CONTROL: +/- 12dB centred broadly, approximately @ 590Hz

With a broad sweep it allows control of Low Mid range of frequency spectrum which is centred above Bass but below High Mid or Treble. These will thin down tone, or naturalise the tone of lower mid biased sound e.g. to linearise speakers, compact speaker cabinets or magnetic pickups which are often mid biased

Cut Low Mid ACW to reduce body handling noise or over loudness on lower strings, muddiness and boomy sound

Increase Low Mid CW to thicken tone. This is popular on nylon strung instruments when playing finger-style or steel strung slide playing

iii) HI MID CONTROL: +/- 12dB centred broadly, approximately @ 880Hz

Will overlap a little tonally mainly with Low Mid and Presence. Cut Upper Mid ACW to thin or “hollow out” tone, reduce bias of middle guitar strings, or remove honkiness, clunk, or peakiness. Increase Upper Mid CW to thicken tone, add punch and increase bias towards middle strings

iv) PRESENCE CONTROL: +/- 7dB centred in narrow band, approximately @2.8kHz. Overlaps into lower treble

and upper mid range areas but offers a useful, narrow but distinctive area of control

Cut Presence ACW to reduce “clunk”, “peakiness” or “harshness”. Also use to reduce low end brightness, reduce bias of top 2-3 guitar strings, “thin” the treble, tame low treble feedback and mellow the sound. A presence cut is also thought to reduce the piezo response effect which is sometimes partly characterised as “quacking”

Increase Presence CW to “thicken” treble, increase “punch” and increase bias to top 2-3 strings

N.B. Pro Audio or dictionary defined “Presence” as used by Headway should NOT be confused with the controls sometimes listed on some electric guitar and bass combo amps which use the “Presence” term to denote high treble. This is because electric amplifier manufacturers had already started to use the term “treble” to define low treble centred at around 2-5 kHz and they needed to find another term for treble, when they added another control targeting higher frequencies

v) TREBLE CONTROL: +/- 13dB centred broadly @ 10.5 kHz with shelving.

Allows control of treble at higher end of the audio spectrum which offers increased brightness on turning CW, or a “mellow” sound on ACW

Treble overlaps mainly into Presence area. However, low strings will also produce some high tones or harmonics if they are not old and corroded

Cut Treble ACW to reduce high end feedback, harshness, externally generated hiss, squeaks from new strings or to compensate for over-bright pickups or hard reflective rooms

Increase Treble CW to compensate for old, dull strings, weak top strings, mellow pickups or dull, boxy rooms and P.As

Use Treble control to fine tune the effect of the Harmonic Enhancer control. For bright sounding piezos, try applying a treble cut, while the Harmonic Enhancer control is placed about halfway up CW or full ON to the right

Humbucker magnetic pickups and flexible piezo film contact pickups will almost certainly benefit from treble control increases in addition to turning Harmonic Enhancer CW

6.3.5 PRE-POST EQ SWITCH TO D.I XLR OUTPUTS

Located on top

To apply EQ to signals or remove EQ from either channel instantly without needing to change EQ settings, or to apply Pre EQ to XLR (B), with Post EQ to XLR (A) Output. Post-EQ describes EQ within the setting. Pre-EQ removes EQ from the setting. The three main applications are:

- i) to easily and instantly check the difference between applying EQ settings and removing all EQ, without the need for changing EQ, or needing to remember the sound of EQ settings
- ii) to remove the EQ from XLR Outputs enabling sound engineers to apply outboard EQ, such as from a mixer (or with engineer operated rack units)
- iii) to remove the EQ from one XLR Output (XLR (B)) for a sound engineer and to apply it to the other Channel (XLR (A)) for backline combo acoustic amp and/or stage monitor(s)

7.0 H.E.A.T

7.1 H.E.A.T - HARMONICS ENHANCED ANALOGUE TECHNOLOGY ~ “HIGH” HARMONICS

Rotary Control and Channel Selector switch

Yellow knob - Located on top

High Harmonic Enhancer generates an exceptional, high end, even, "harmonic sparkle", restoring "string zing" to older strings, replacing natural tones lost from your instrument due to amplification or use of magnetic or piezo pickups and many microphones and defining string separation, enabling greater clarity to be heard in ensembles

The 3 way channel switch allows H.E.A.T to be applied to Channel 1, Ch.2, or both simultaneously. The treble tone can be completely re-shaped in this way by turning down treble control (ACW)

It is possible to add too much Harmonic Enhancer. If the sound becomes thin or harsh (“over excited”), back control off or back off treble

7.1.1 PIEZO PICKUPS - Ceramic, crystal and condenser microphones:

If sound is perceived as being bright, try putting Enhancer Control in 1/3 CW up position for modest effect then try turning Treble and /or Presence control pot ACW to fine tune overall sound. This will boost high harmonic content while reducing lower frequency "clunky" treble content and the piezo "quacking" response

7.1.2. MAGNETIC PICKUPS, DYNAMIC MICROPHONES AND FLEXIBLE PIEZO FILM

PICKUPS: These tend to be on the over mellow or boxy side, with magnetic pickups usually not producing tones above 4kHz -5kHz, while Piezo Flexible Contact Film Pickups can often produce no higher than 2 kHz. Put Treble control in the centre and Enhancer control pot 2/3 CW to the Right, then try increasing treble control CW as there would then be something there for it to be able boost. Re-adjust Enhancer control to your taste Headway's SAM-1 Magnetic Pickup already incorporates Harmonic Enhancement Analogue Technology

7.2 "RICH" H.E.A.T ~ HARMONICS ENHANCED ANALOGUE TECHNOLOGY - VALVE BLENDING.

Utilises Gain Pots, Valve Level Rotary Pot, Channel Selection (3 Way) Switch, On/Off Switch
Located on top - Yellow knob (Cool to Warm)

The Valve Blend facility is a luxury feature that allows the variable addition of rich, warm sounding “even” harmonics and some higher harmonics EDB-2 VAP is fitted from new with a high fidelity, low microphonics version of the 12AX7 where available (some shortages at time of print), to maximise lifespan and minimise the pickup of percussive noises

EDB-2 VAP offers a Valve at the Pro Audio and mainly clean end of the spectrum and should not be confused with the same Valves used somewhat differently for overdriven distortion, as popular for high end electric guitar amplifiers

The 12AX7 Valve also takes the edge off peaks in the shape or envelope of the note, smoothing the response and greatly reducing any piezo “quack”

When sound is altered and a different aspect of it is brought to the fore it normally means partly obscuring or downplaying some other aspect or element in the tones. In other words, you can have too much of a good thing. If you drive the Valve harder and through both sides of the Valve using the Doubler you may enjoy the sound more as it is driven harder. However, a degree of treble is likely to be lost by this non linear device and it may need to have treble, presence and/or “High” Harmonic Enhancer added, or mids cut to get the sound just right

Alternately, you may find that driving the valve less hard produces a sharper treble that can cut through a mix, with a smaller amount of “rich” harmonics. These valve harmonics are a form of benign, gentle distortion which are pleasant to the ear

Most people greatly enjoy listening to the sound produced by valves, often craved by musicians. Headway effectively tailors to the needs of the acoustic player and to the pleasure of concert goers

7.2.1 SETTING UP YOUR “RICH” HARMONICS VALVE SOUND: Ch.1

Set up your usual live sound at lowish but audible volumes from your pickup or microphone on Ch.1, mainly focussed on Ch.1, with Gain control at low levels and Master volume up higher, with Valve Blend control at “0” Put Valve selector switch at Ch.1 position and switch Valve ON

Turn Valve Blend control up CW to bring valve sound in and listen to the difference in tone with a slight boost in gain, which may be countered by Gain or Master controls

Turn the Valve Blend control up CW towards “Warm” to increase Valve effect

For a cleaner, drier or brighter sound, back the Valve Blend control off ACW toward “Cool”

For a more intensive Valve effect, change the selector switch to valve Doubler and try the Valve Blend control in different positions. The Doubler will add slightly to mid range, which may be countered by EQ controls

To achieve a harmonically rich effect, while retaining a brighter cut through (e.g. through a mix), apply Valve Doubler to Ch.1 and try applying Valve Blend control at around 1/3 CW

With Valve Doubler in operation on Ch.1, the valve cannot then apply to Ch.2

The Gain control provides additional Valve drive. See: Gain and Master in Joint Operation 6.2

If the Valve sound has lost some high frequencies they may be added by turning up the “High” Harmonics. Further fine tuning may be made by reducing or increasing Treble and Presence controls, which offer an enormous pallet of tones to play with, to fine tune the sound

There may be a noise when switching Valve ON or OFF, so try to do this when not turned up and connected for live sound. See Noise Notes 6.1

7.2.2 POWERING THE EDB-2 VAP VALVE

The Battery Backup cannot power the Valve and associated features

Rotary Control with yellow knob and 2 switches - Located on top

Batteries are not supplied fitted into EDB-2 VAP to ensure that when trialled as new, it is powered via EDB/VAP-PSU to demonstrate that all functions are working

The valve will only power up where the EDB/VAP PSU supplied is plugged in and powered from a reliable mains supply electricity preferably with mains filter and surge filter. A delay of around 10 seconds applies before it comes into full operation. Headway strongly recommends against using an alternative DC Power Supply Unit and any such use may negate the EDB-2 VAP Guarantee

See: Electrical Specifications 19.2

7.2.3 HANDLE VALVE DEVICES WITH EXTRA CARE!

Valves have delicate internal parts and are subject to high voltages and high temperatures. IT IS DANGEROUS TO TOUCH OR TAMPER WITH VALVES (TUBES) DURING THEIR OPERATION OR FOR SEVERAL MINUTES AFTER OPERATION

Valves do not last indefinitely and will eventually burn out with use or disintegrate from rough handling. **Handle with Care!**

Turn off valve with Blend control or valve switch when not required

Do not subject EDB-2 VAP or other Headway products to dust or liquids

7.2.4 VALVE SPARES, MAINTENANCE & MODIFICATIONS

You may find it worthwhile to carry a spare 12AX7 low noise Valve, padded and protected and a spare Headway VAP/PSU to cover any potential loss or breakage

EDB-2 VAP's 12AX7 Valve can be changed with care, using EDB-2 VAP's easy access cover. Changing the Valve for another 12AX7 or checking batteries for leakage and changing them, are the only User Maintenance task allowed under the Guarantee. See Electrical Specifications/ Maintenance

Custom Valves: Headway may be able to offer non standard 12AX7 Valves with particular characteristics on tone, overdrive, output & noise. All carry an additional

cost and are subject to availability. **THIS IS THE ONLY MODIFICATION ALLOWED WHILE RETAINING THE 12 MONTHS GUARANTEE / WARRANTY**

Valve types other than 12AX7 may fit the Valve socket base on EDB-2 VAP, but their operation will not be correct and this may negate the guarantee

7.2.5 SETTING UP YOUR “RICH” HARMONICS VALVE SOUND VIA CH.1 & CH.2 FOR BLENDED SOURCES

Set up your usual live sound as above, but with pickup or microphone on each channel

Two sound sources may be differentiated more effectively by combining a warm source with a potentially brighter sound. Doubler will apply as an option, only to Ch.1

7.2.6 VALVE SOUND FOR PARTICULAR USES

SOLOING. Soloing or playing a melody usually benefits from increased volume and a thicker, weightier sound. Increase upper and lower mid range, turn up the Valve Blend and apply “Doubler”

POWER CHORDS. Power chords may be enhanced by a combination of careful tuning of the EQ, increasing of

bass and treble, plus High Harmonics Enhancer, possibly lowering High Mid and Low Mid. Blending in Valve adds an additional dimension of richness

CUT THROUGH. To achieve a powerful rhythm guitar sound that cuts through a mix or ensemble, try the single valve, add some harmonic enhancer with treble boosts and mid cuts

COMPRESSION. The Valve adds a limited amount of gentle, soft knee compression from different strings, reducing the difference between the loudest and the quietest levels of sound. This may be an advantage for fingerstyle or arpeggio playing, looking for a smoother and less uneven sound

OVERDRIVE. Unlike electric guitar Valve pre-amps and amplifiers with Valve stages, EDB-2 VAP is not primarily designed for overdriving the Valve into distortion. Mainly for acoustic playing it should be avoided. However, with a decent level of signal from a pickup, such as a high output humbucker, some overdrive may be obtained

To get a good overdrive sound from an acoustic guitar, it is best achieved with a magnetic sound-hole type pickup, preferably a humbucker and an active one to get a high signal level, such as Headway's SAM-1. Piezo pickups do not sound pleasant or authentic when overdriven

Use Channel 1 and select Doubler. Turn Gain pot up high CW, turn down Master Volume ACW to compensate and turn Valve Blend Control up high CW. You may also wish to cut treble and presence and boost mids, to achieve something closer to a classic thick distorted sound

An acoustic guitar magnetic sound-hole pickup may sound more like an electric or archtop if you use nickel plated steel wound strings or stainless steel electric guitar strings. However, fitting all steel strings with an acoustic sound-hole magnetic pickup may not balance string to string accurately. With magnetic friendly alloy blends of strings, such as “white bronze” or nickel plated bronze strings, an even string balance may be easier to achieve. An over loud “B” (2nd) string may be attenuated by lowering a pole, blocking the magnetic field under that string, or replacing a steel pole with a plastic pole. Using a low output pickup, such as a passive magnetic or passive piezo pickup may require a very high gain from EDB-2 VAP

ARCHTOPS, SEMI-ACOUSTIC & ELECTRIC GUITARS

EDB-2 VAP is ideal for achieving a great sound with archtops and semi acoustic guitars. Regular solid Electric Guitars also work for clean, warm or slightly distorted sounds. A humbucker will produce a stronger signal than most single coil pickups

EDB-2 VAP offers players of these guitars a high quality, highly variable range of tones and great warmth at low noise, which would be appreciated by jazz, blues, country, folk rock, or rock players at the lighter end of the spectrum. Much the same applies to various world music players and the likes of Celtic and Greek bouzouki

8.0 CH.2 / STEREO IN AND XLR MICROPHONES

8.1 INPUTS

Located on front end

Ch.2 is suitable for additional pickup or microphone from the same instrument, or to facilitate and balance two instruments or microphones and provides a full independent set of EQ for each. As with Channel 1, it suits active and passive magnetic/piezo pickups as well as a wide range of microphone types

8.1.1 CHANNEL 2 - STEREO JACK INPUT

Stereo jack input feeds separate signals to both Ch.1 & Ch.2. The signal on the tip of jack (red or white wire in stereo cable) feeds Ch.2.

The signal on the ring of the jack (blue or black wire in cable) feeds Ch.1

Inserting a mono jack plug into the Stereo In feeds Ch.2 only, which frees Ch.1 for additional use

While the ring connection from Stereo In socket is normally routed to Ch.1., should a jack plug be inserted into Ch.1 jack socket, this would take priority and would cut out the ring connection from the Stereo IN socket

Phantom Power: If no Jack Plug is inserted into Ch.1 Jack Input and Phantom Power is switched onto Ch.1 Jack In at Ring position, then the Phantom will rout to Ch.2 Jack IN to the Ring connection

Warning - Inserting a live power amp to inputs or Return sockets is likely damage to the unit and negate the guarantee / warranty. Headway Music Audio will NOT accept requests for information on other manufacturers' wiring or specifications

Headway Music Audio will not be held liable for damage to other manufacturers' pickup systems from phantom power

The ring position suits more typical active pickup systems where wired for phantom power

Tip position powering is required for many electret condenser mic based systems

8.1.2 MIC INPUTS XLR x 2

CH.1 AND 2 : Impedance < 3.4k Ohm. XLR input accepts dynamic, ribbon, condenser, silicone Condenser (MEMS) and electret condenser microphones
The XLR Ch.1 & 2 inputs allow the use of one to two high quality condenser microphones. Microphones may be used in stereo

Uni-directional microphones such as cardioid and especially hypercardioid polar patterns optimise volume levels in a live setting before feedback occurs

A 3 way switch offers 10v or 48v phantom to XLR

10v is optimal for most electret condenser microphones or active pickup systems while

48v is optimal for true condenser microphones

Headway XLR 3 pin wiring on inputs and outputs is at standard configuration. See: Electrical Specifications 19.2 / Pickups and Microphones 3.0 / Phantom Power 9.0

8.1.3 MICROPHONE SWITCHING

Located on top

2 Way Switch offers XLR ON/OFF Switch off when not in use to save battery life and minimise noise

8.1.4 AUX IN: PSEUDO 3RD CHANNEL

Located on front end

Auxiliary In is intended for a sound source not requiring signal processing or high gain. Aux In is typically for pre-recorded backing tracks or drum machine. Aux may be used as a simple 3rd Channel to Master Volume, where there is a strong active signal and may require a jack adapter (1/4" / 6.35mm to 3.5mm). This arrangement does benefit from separate controls . See: Aux In 14.0

8.2 MICROPHONE USE NOTES :

VALVE USE WITH MICROPHONES

EDB-2 VAP applies audible warmth to the sound of any microphone across a range of applications. Condenser microphones can offer great detail and sensitivity on amplifying acoustic, orchestral, world music instruments or vocals. Condenser microphone sound amplified over standard solid state equipment may sound a little harsh or cold tonally and may be greatly improved in quality by applying EDB-2 VAP "Rich" Harmonics via the Valve. See: Phantom Power 9.1

MICROPHONE MOUNTING ADVICE

Headway Music Audio suggests caution on the use of internal microphones within instrument bodies. Miniature microphones supplied with most pickups available, or purchased separately at low cost are often poor quality. These are usually electret condensers

Musical instruments are voiced to be heard from the outside, whereas internally, body sounds usually offer excessive mid/bass boom

Most microphones are meant to be used in free air where sound waves travel mainly from the front of a diaphragm to the rear. Inside instruments, sound reflections and partial cancellations from standing waves may cause phasing problems, causing a “swirling” effect and preventing clarity

The placement of a microphone in free air inside a resonant chamber may produce uneven peaks and make them highly prone to feedback

TESTING OR PERFORMANCE: the testing of internal microphones at very low volumes is not likely to replicate what happens at typical live performance volumes or in difficult acoustic conditions. Where there are difficult acoustics or higher volumes, this is likely to cause

additional problems with feedback, resonances and boom

BLENDING: If you try to blend in some mic you may be severely constrained by stage sound pressure levels from PA speakers, monitors, or backline combo amps and you may have to turn down the mic volume to prevent feedback to such a low signal that it is effectively perceived as being turned off

BAND LIMITING: Microphone feedback may be reduced by using a pickup to supply mid / bass and a microphone to supply presence / treble

POSITIONING: If you try to make the mic sound a little less boomy and unnatural by pointing it out of the sound-hole you may be making it more likely to pickup speaker cabinets and monitors and more likely to feedback

If a uni-directional microphone is mounted outside of an instrument, it may be offset to cut its potential to feedback, by angling it to keep front and rear of the mic pointed away from the main sound source

GOOSENECKS: External goosenecks with uni-directional (cardioid or hyper cardioid) polar pattern microphones, are usually best pointed at the upper bout,

close to the top “E” string, but not directly at it. Keep microphone away from soundhole. Do not point rear of microphone at sound-hole

If an internal microphone is on a flexible gooseneck you may lessen the problems by spending time finding the best sounding spot for placement but caution is suggested in case it moves or changes angle slightly, you take it to a different acoustic environment, as it interacts differently with the room

ANTI-FEEDBACK ELECTRONIC DEVICES: If used correctly, these can help a lot at the professional sound engineer level but the sound quality that a good microphone can deliver is incrementally compromised by use of anti-feedback electronic devices. The harder they work, the more elements they lose from the sound, which defeats much of the aim of using a microphone. Non technical players may find these rack and half rack units difficult to use effectively

POLAR PATTERNS: For optimal sound quality, Headway recommends that, if used, microphones should be used externally and with uni-directional, cardioid and hyper cardioid polar patterns

Omni-directional microphones may produce a natural sound at low cost but there is no feedback rejection. Their resistance to feedback is the least effective of any

such device and they are not usually practical for live amplification, except at very low sound pressure levels

FULL SIZED/LARGE DIAPHRAGM MICROPHONES:

Full sized/large diaphragm, uni-directional condenser or ribbon microphones may be mounted on standard microphone stands or guitar body mounting bracket

REVERB: A quality digital reverb (e.g. Lexicon) with a slow natural decay, on a room/hall reverb setting a little larger or longer delay than the ambience of the space you are performing in, can add the impression of "air" in the sound

Headway is planning to introduce miniature "MicroPure" silicone condenser microphones and "SuperBug" contact pickups in versatile modular active blender form

9.0 PHANTOM POWER

Located on top

9.1 - THREE WAY PHANTOM SWITCH TO CH.1 JACK IN - 10v TO RING / 10v TO TIP

This is not to be confused with the XLR On/Off switch on the top, which switches off the XLR circuitry EDB-2 VAP phantom power provision enables external powering of certain active pickup systems and blender systems on board instruments with no battery inside where wired to

accept phantom power via ring (stereo jack lead) or wired to accept phantom power to tip. Active pickup or active pickup/mic blender systems wired for phantom should NOT require an internal battery. This may be an advantage where active system performance is required but where battery access may be restricted e.g. "f" hole instruments and resophonic guitars

When using phantom power, we recommend removing any battery in place in a pickup system, whether new or expired, which might be heated up, or be damaged and leak. Bridging the two battery snap terminals on the pickup system with a wire from positive to negative would be required to complete the circuit. Alternatively use Headway's "PPE Clip" (Phantom Power Enabler) which is fast and reversible and available to HE5 & Snake3 purchasers

Blender systems which include electret condenser microphones may be phantom powered via 10v to Tip. Consult pickup manufacturer's instruction manual on voltage and wiring. It is not the responsibility of Headway Music Audio to determine compatibility

10v Phantom power has been identified as the maximum commonly accepted voltage for optimum signal to noise ratio, headroom, tone quality and output levels in many pickup systems and electret condenser microphones

EDB-2 VAP Now mixes Stereo Inputs to Jack IN on Ch.1 or Ch.2, across both channels, while accepting Phantom Power to Ch.1 or Ch.2 Jack In

9.2 - THREE WAY PHANTOM SWITCH TO XLR IN : OFF / 10v / 48v

Located on top

48v powers true condenser microphones optimally. Top quality reproduction may be obtained in this way. Many condenser microphones will also operate on a lower voltage.

9.3 PHANTOM POWER CONSTRAINTS: EDB-2 VAP cannot be powered via phantom power from a mixer, due to insufficient milli-amps provided. EDB-2 VAP is a multi function device and not a simple, minimal D.I box and the quality of components used have NOT been compromised to run at low quality, at a low power consumption

Valves cannot be run via phantom power (or batteries)

Applying phantom power from a mixer to EDB-2 VAP will not damage the unit

10.0 NOTCH FILTER CH.1 & CH.2 –

ANTI-FEEDBACK / BOOM. Width at grey knob. Cut at blue knob - Located on top

Sometimes known as a “sweep” the notch filter utilises two rotary pot controls, an On/Off switch and a channel selector switch. They apply either to line out and D.I outputs. Control markers are only an approximate guide to frequency and band width

10.1 NOTCH-Q CONTROLS. “Sharp” to “Wide”

bandwidth application. Sets the bandwidth or spread of notch cut for filter around the frequency setting of the Notch control rotary pot. Turning ACW to narrow or “Sharp” reduces width of cut towards minimum width while turning CW up to “Wide” increases width of notch cut towards maximum

A “Sharp” width enables you to seek and remove typical narrow but problematic feedback peaks

10.2 NOTCH FREQUENCY SELECTORS. 50Hz - 6kHz

Sets the approximate centre frequency from 50 Hz (low bass) - 6kHz (treble) via a rotary control pot to which the "Q" Pot sets a broad or narrow notch cut either side of the position

10.3 NOTCH FILTER SWITCHES. Two way switch determines whether the Notch Filter is in or out. This enables you to instantly determine whether you like the application set On / Off without altering settings. The LED indicator illuminates blue when filter is applied

Two way switch applies notch filter to Ch. 1 or Ch. 2 alternately

Avoid leaving switches between settings as this could short out operation of the preamplifiers until moved into a positive position

10.4 NOTCH FILTERS IN OPERATION

This is a versatile, supplementary tone control on each channel which can be used subtly at the "Sharp" or narrow end or severely at the "Wide" or broad end. It is the most precise and effective method for cutting highly intrusive or severely problematic sounds such as feedback, excessive booming and body handling noise, background rumble, honky upper mid range or muddy lower mids. You may first try the Notch Filter on what seems to be the most problematic frequency spectrum leaving the other EQ controls at their centre position. Here are a few potential strategies

10.4.1 CUTTING UNWANTED BASS TONES

- i) Set the Notch frequency control ACW well below useful tonal range of instrument or fully ACW
- ii) Set the Notch-Q width control close to or fully ACW
- iii) With the Notch switch selected for channel, adjust the Notch-Q Width control from its minimum ACW setting slowly turning CW while listening to the amplified low strings until the tone of the low strings starts to thin out and clarify as required. Rebalance both controls slightly in order to fine tune the maximum amount of cut and the roll off point according to what sounds best

10.4.2 CUTTING UNWANTED MID RANGE

Set Notch-Q and Notch frequency controls around middle of dial and then, whilst listening to the amplified sound, adjust the Notch frequency control to find where the cut is most effective. Increase or reduce the Notch-Q control until the problematic frequency is minimised without taking a wider cut than is necessary. You can switch this Out and try the same with the EQ controls for Low Mid and High Mid, to see what works best or whether it should be a combination

10.4.3 FEEDBACK PEAKS AND SPIKES

These are best countered by setting the Notch-Q width control fully ACW (as narrow as possible) Next, whilst listening carefully, slowly turn the Notch frequency control CW. Turn CW until unwanted noise has been located and removed Parametric Notch EQ should be used carefully and sparingly. Frequencies that may sound unpleasant when heard in isolation may need to be retained as part of the overall mix of a body of sound, to enable it to be perceived as full, natural or balanced. An alternative view would be that carefully tuned active EQ boost and cut can be used creatively beyond just problem solving

10.4.4 BEATING PIEZO “QUACK”

The infamous piezo “quack” is a transient spike which upsets the smooth operation of amplifiers and creates a brief unpleasant noise or distortion. It occurs between about 950 Hz and 5kHz, but is usually centred between 1.5 kHz and 3.5 kHz, depending on the instrument, pickup and setup

EDB-2 VAP performs this function more effectively than other methods when the Valve is dialled into the mix in sufficient proportion

Try cutting presence control or could try a more severe and accurate bearing down on it by setting “Q” control at the most narrow ACW position and turning Freq. CW to around 2-4 o’clock, listening carefully while strumming hard on top 3 strings and damping off the sustain with hand techniques. This enables hearing the initial attack which is where most “quack” resides. Then try moving the Freq. control slightly either way until it is minimised

Next try widening the frequency cut by turning frequency control CW to further “hollow out” the worst culprit frequencies

In addition, you may compensate for your possible loss of brightness, by turning up treble control CW and/or H.E.A.T High Harmonics control. Increasing bass, low mids and possibly high mids, may further obscure any remaining “quack”

Additional methods to reduce piezo “quack” include:

- i) seating under saddle pickups better with an even string to string balance and ensuring that the saddle does not keep shifting about against the pickup as you play
- ii) enabling any guitar saddle to be able to fall out under its own weight when destrung, but not loose enough to be pulled forward under string tension

iii) using a pro audio limiter (or compressor/limiter) to further reduce the peaks

iv) using a non piezo pickup i.e. a magnetic pickup (SAM-1) and/or microphone

11.0 RANGE CONTROLS / ANTI-FEEDBACK - Ch.1 & Ch.2

Blue knobs x 2 - Located on top

These rotary pot controls set a high pass filter which rolls off lower frequencies from an increasingly higher frequency point, as it is turned CW. This control rolls off bass, to avoid low frequency feedback and "muddy" resonances from the instrument body or environment, but allows through and amplifies the frequencies above that. This may be partly countered by turning up Bass or Lo Mid controls, which overlap, or are further re-enforced by turning those controls down

11.1 RANGE CONTROL SETTINGS

On the lowest ACW setting:

i) **Bass /Full Range:** this rolls off gently below 40Hz. If the instrument's lowest note is at 40Hz, such as lowest note on a 3/4 double bass, it produces nothing below that

except possible unwanted thumps, handling noises, pops, feedback and rumble

This setting might be a starting point for all bass instruments. You may prefer a little higher setting for baritone guitar, cello and mandocello

ii) **Guitar:** Cuts bass frequencies gently below around 80Hz, which may allow sufficient signal when the lowest string is dropped from bottom "E" to "D" (70Hz) or down to "C" (65Hz). Alternatively turn control ACW to increase low frequencies . Setting also applies as a starting point to 12 String, electric and nylon strung guitars, resophonic and pedal steel guitars plus other mid range instruments,

Ensure that Combo Amplifiers and P.A speakers are capable to reproducing these guitar and bass frequencies as many small cabinets will typically not produce any fundamental frequencies below about 130Hz

iii) **Violin:** Cuts bass and low mid frequencies significantly below 200 Hz. This setting also applies to similar smaller, higher pitched instruments such as mandolin and ukulele. If this setting is applied to a lower pitched viola or tenor mandola for instance, the fundamental low end would be significantly trimmed

Setting "Range" control higher, fully CW at 300Hz will thin out the sound. See "Rock Acoustic" below

The Instrument markers are rough guides and not set in stone. Listen to the result at the low and decide where you want the two control(s) based on depth of sound required and whether there are problematic aspects that may need trimming out, such as low thump

The frequencies offered around the controls are approximate

11.2 STRINGED INSTRUMENTS - THEIR LOWEST FREQUENCIES PRODUCED

This is an approximate guide to help set Range Control or Notch Filter, to tame boom and feedback

Bass Guitar/ Double Bass (E) = 40Hz

5 String Basses theoretically produce 30Hz on Low "B" string but there is no fundamental produced at around that low a frequency. In addition, no bass amplifier available is able to reproduce such low frequencies. Instead, we perceive the 30Hz via the harmonics, at an octave or more above, i.e at 60Hz. Set Control ACW around "Bass" position or according to taste

Baritone Guitar ("B" to "B") = 60Hz

Cello (Low "C") = 65Hz

D Guitar (Dropped "D" Guitar Tuning) = 70Hz

Acoustic Guitar / Nylon Strung Guitars ("E") = 80Hz

**Bouzouki (Celtic "G") Octave Mandolin/
Oct. Mandola / Tenor Banjo = 100Hz**

Tenor Guitar ("A") = 110Hz

**Viola / Tenor Mandola / Greek Bouzouki (C3 / Middle
"C") = 130Hz**

5 String Banjo (Typical lowest note "D") = 147Hz

Violin/ Mandolin ("G ") = 200Hz

Soprano Uke ("A") = 210Hz

11.3 " ROCK ACOUSTIC" SETTING: where amplifying an acoustic guitar or other acoustic instrument over a loud electric band, such as where high powered stage monitor speakers are used, there may be little or no point attempting to amplify the bass end of an acoustic guitar since it would be obscured by electric bass guitar, bass drum or keyboards etc. It may be prone to feedback at relatively low volume levels. This setting contributes to defeating feedback on acoustic instruments

To achieve a “Rock Acoustic” effect, set Range control fully CW. You may further reduce bass and low mid EQ controls and may set Notch Filter to cut broadly below approx. 300-800 Hz. The effect would be to allow the "shimmer" of Acoustic Guitar chords to be heard, with lower frequencies cut. The result may be a useful sound in ensemble, similar to cymbals, but with the minimum possibility of feedback at higher volumes

11.4 DUAL INSTRUMENT MIX : Blending two instruments together with similar ranges can cause the sound or individual notes to partly cancel each other out. In order to prevent this, the signals may be separated audibly in a mix by substantially cutting the low end of one Instrument. To achieve this effect use Range, Notch Filter or Bass and Low Mid Controls

12.0 PHASE REVERSE / ANTI-FEEDBACK

Located on top

Allows you to better match between separate signals via 2 channels in a mix, or via both channels compared to non EDB-2 VAP signals in any larger mix.

Phase is equivalent to tiny time delays between separate signals. The function is to make signals sound more integrated within a mix

Phase Reverse is also used to beat feedback. A small change in tone is inevitable

"In Phase" - Normal position. Signal is unaffected

"Out of Phase" - In middle position. Ch.1 against Ch.2.
May be used for antifeedback

"Out of Phase" In top position. EDB-2 VAP against other non EDB-2 VAP signals in a mix. Alternative anti-feedback option

13.0 SEND & RETURN

13.1 FX LOOP CH.1

JACK OUT & JACK IN

Located on left side

Effects (FX) pedals or rack units may be connected in line using short mono jack leads, or patch leads. Jack to jack adapters may be used if they are able to line up effectively. Changing the order in which FX pedals are connected will also affect tone and how noise levels compound. Therefore, pedals with the highest output and lowest noise (s/n = signal to noise ratio) may be best placed first in the chain

FX may be added to an Output of EDB-2 V.A.P.
However, you should be aware that this placement would mean that the FX will not then be present on other Outputs from the pre-amplifier

13.2 INSERT POINT: STEREO SEND & RETURN (Tip / Ring / Sleeve: TRS) - CHANNEL 2 FX LOOP

Located on left side

Requires a “**Y**” **Lead** (stereo TRS jack plug to 2 x mono jack plugs. Enables a chain of FX to be inserted into Ch.2

Send signal is to Tip of jack plug (usually red/white wire) and return signal to Ring of Jack Plug (usually blue/black wire)

13.3 FX & SOUND PROCESSING DEVICES

Devices in the FX Loop may include the list below

Recommended order of chain of FX Pedals/devices on Send & Return:

Tuner - Valve/ Tube Device - Compression/Limiting - Additional EQ - notch filter - pitch shifting (octaver, harmoniser) - modulation (phaser/ flanger/ vibrato / trem etc) - delay (echo) - reverb - volume pedal - noise gate.
Change the suggested order to get different effects

In order to retain an acoustic type sound, Headway recommends avoiding electric guitar type compressor pedals, overdrive/distortion or wah pedals for acoustic instruments.

A more electric guitar like sound may be achieved via a Magnetic Pickup, e.g. SAM-1

In order to retain an acoustic type sound, use FX sparingly.

A Noise Gate pedal may be added to the end of an FX chain to cut hiss noise when no signal is live. However, the noise returns once the signal is underway

13.4 MAINTENANCE OF SEND & RETURN SOCKETS

Located on left side

CAUTION: Take particular care to ensure Send & Return sockets and Insert Point remains free from a build up of dust, dirt or corrosion which may prevent the channel from operating

Headway recommends that jacks socket contacts be kept clean to maintain working operation. Lubricate a jack plug with Switch Cleaner (with Lubricant), or WD40 and plug in and out of the sockets repeatedly (30 seconds) to clean contacts

14.0 AUX IN

Located at front end

3.5mm mini jack socket routes directly to Master Volume control (post EQ). Intended to connect an analogue audio signal of pre-recorded music for practice or backing

Aux may be used as a pseudo 3rd Channel, where other controls are available

15.0 MASTER VOLUME CONTROL

Green knob - Located on top

Sets the output level of the EDB-2 VAP

Output will also be affected by Gain controls, Range control, Notch Filter and the level of the input signals
Use in conjunction with Gain controls. Turn CW to increase Output. See: Gain & Master - Joint Operation 6.2

16.0 ANALOGUE OUTPUTS

16.1 LINE OUT

Located on rear end

Line Out is a standard mono jack socket output at low impedance and post EQ (EQ controls affect output), able

to run long shielded cables of good quality without significant loss or noise build up. The output is a blend of the two channels and is likely to be ideal for acoustic combo backline amps or powered stage monitors. Line Out may interface with rack units, FX pedals, headphone amps, many recording interfaces and some amplifiers etc

16.2 D.I BALANCED OUTPUTS VIA TWO XLRs

Located on rear end Balanced XLRs are less sensitive to cable quality. They minimise noise or losses from long cable lengths and may be interfaced with rack units, pedals, combo amplifiers, headphone amps, recording interfaces and some power amplifiers

XLR OUT “A” routes Ch.1

XLR OUT “B” is linked to switch located on top, offering:
Ch.2 Mono, Ch.1 Mono, or a Mix of Ch.1 & Ch.2

Front of house sound engineers sometimes prefer separate balanced stereo outputs from Ch.1 and Ch.2 respectively

An XLR Output lead that terminates in a stereo (balanced) or mono jack plug may be used as an alternative to XLR to XLR leads, where convenient

Passive D.I boxes are designed for microphones only and can be problematic with pickups. EDB-2 VAP eliminates the need to resort to inferior D.I. Boxes or additional D.I boxes in the signal chain

Uses standard 3 pin XLR wiring. See: Electrical Specifications 19.2.7

17.0 USB Charger OUT: USB 2.0 TYPE A

Located on rear end

For digital devices requiring 5v and up to 0.5A load current.

Powered from Headway Power Supply Unit only. See: Electrical Specifications 19.2.6

Not for powering analogue sound devices

18.0 POWERING OPTIONS

18.1 D.C POWER SUPPLY UNIT (PSU) : 18v D.C Adapter

**ONLY USE HEADWAY POWER SUPPLY UNIT
EDB/VAP-PSU SUPPLIED MAINS PLUG CONNECTOR
TYPES & CATALOGUE REFERENCE BY TERRITORY:**

EDB/VAP PSU UK =United Kingdom/Eire/Singapore

EDB/VAP PSU EU =Europe (Continental Mainland)
EDB/VAP PSU NA =North America/South America/Japan
EDB/VAP PSU AUS =Australasia/South Africa

Inserting small D.C plug from PSU into D.C socket on rear end of EDB-2 VAP overrides the battery. Only Headway's Regulated Power Supply Unit should be used.

CABLE CARE: continual knotting or stressing of PSU Output cable will result in subsequent failure. Storage advice: A loose loop of the cable held by a re-useable nylon or double sided Velcro cable tie, will mitigate stress and allow it to last for years.

See: Electrical Specifications 19.2

18.2 BATTERY BACKUP POWERING OF NON-VALVE FUNCTIONS

Via 9v PP3 (6F22) x 2, supplied as standard, and housed under angled aluminium panel cover. Undo the engraved, knurled brass nut to slide off cover and access batteries

Connection is via two fixed, non-reversible clips which should be pinched on tight



Batteries should be new, both identical and their condition checked before use to avoid damage or injury. Dispose of leaking OR expired batteries responsibly

Warning! Battery acid is corrosive to skin

Battery removal is unnecessary whilst using a Headway DC PSU Adapter

EDB-2 VAP cannot be powered by phantom power, such as from a mixer. However, if phantom is applied to XLR Out, this will not affect its operation

EDB-2 VAP is designed to be powered with batteries only for short term use a temporary backup to the DC PSU.
Lithium, lithium polymer rechargeable or ion

rechargeable high capacity PP3 (6F22) batteries are there most suitable of rechargeables.

Type of battery, i.e Lithium, is more important than brand or manufacturer, so you might source the least expensive of the correct types.

Electronics retailers may be the best battery suppliers. Avoid purchasing batteries past the “Use By” date, with opened packaging, used, counterfeit, or from open air markets

18.3 LIFESPAN OF BATTERIES IN EDB-2 VAP FOR BACKUP WHILE POWERED ON

1st: Lithium: around 20 hours where 1200mAh of power On, or 15 hours if Phantom Switch also ON, which depends on current draw of device EDB-2 VAP is phantom powering. Lithium have the longest life, but are relatively expensive and banned from normal international transit, fitted, not fitted or expired

2nd: Alkali: around 10 hours where 600mAh of Power ON, or less hours if EDB-2 VAP Phantom Switch also On. These are often the best value non-rechargeable battery to purchase in terms of cost per hour and long, reliable life

Zinc Chloride, Manganese, Zinc Carbon or NiCd
Batteries: NOT recommended for EDB-2 VAP

**Do not dispose of batteries in landfill rubbish
(garbage) collections. Please make use of local
government or commercial battery collection
schemes**

**18.4 LIFESPAN OF RE-CHARGEABLE BATTERIES IN
EDB-2 VAP** - based on battery manufacturer claims of
specification when new:

1st Lithium Polymer Rechargeable PP3: at approx. 20
hours

2nd Lithium Ion Rechargeable PP3: at approx. 10hours
(roughly comparable to Alkali when new)

3rd Ni-Mh (Nickel Metal Hydride) PP3 9v 280 mAh: at
approx.hours

4th Ni-Mh, at 9.6V 220 mAh PP3 NiMH Rechargeable
Battery: at approx. ... hours

Headway advises keeping two spare lithium PP3
batteries, plus two further lithium PP3 installed for
EDB-2 VAP

18.5 LOW BATTERY INDICATOR LED

Located on Top

Indicates that battery life is close to being expended.
EDB2-VAP should continue to function for several hours after which the voltage remaining falls below the minimum required 7.3v (per battery)

International Shipping with Batteries. See: Storage and Transport 1.8

19.0 SPECIFICATIONS OF EDB-2 V.A.P

EAN Product Code:

EDB-2 VAP: 7107716990885

Customs Classification & Code: Graphic equalisers & mixing units: 8543 70 90 99

19.1 PHYSICAL SPECIFICATIONS

Dimensions: Aluminium Metal Box length

215mm*140mm*49mm (")

Overall length with connectors= 225mm (")

Box width 140mm ("), Overall width = 145mm (")

Depth of metal enclosure = 49mm (")

Depth including knobs and feet = 64mm (")

Weight = 940g (oz) without batteries

Weight with batteries here at = 1040g (lb)

Weight of retail packaging for shipping complete with
EDB-2 VAP = g (lb)

Dimensions of retail packaging complete with
EDB-2 VAP = mm x mm x mm (" x " x ")

Microphone stand bracket connector: Female threaded
bush on rear at 9/16" to
19/32" Imperial). DO NOT OVER TIGHTEN!

19.2 ELECTRICAL SPECIFICATIONS

19.2.1 CH.1 & CH.2 jack input impedance

Located on top - 3 way switch

Low impedance/active = 1.2 Meg. Ohm

High impedance = 6.8 Meg. Ohms

High+ impedance = 20 Meg Ohms

Gain control to Ch.1 jack: Continuously variable 0 -
+32dB jack IN: Offers mono signal path IN via tip plus
phantom power 10v option, sent when switched on via
ring or tip switching options

Gain control to Ch.2 jack: Continuously variable 0 -
+32dB jack IN: Offers mono to ring (Ch.2) or

Stereo signal path IN via jack: Tip to Ch.2 & ring to Ch.1

XLR Mic Inputs on Channels 1 and 2: Continuously variable 0 - +50dB and switchable phantom power 10v -48v option.

XLR Microphone inputs: Impedance = 3.4kOhm

19.2.2 BAXENDALL INTERACTIVE 3 BAND EQ SECTION

Treble: @ 10.5 kHz +/- 12dB Shelf

Presence: @ 2.8 kHz +/- 7dB

Upper Mid: @ 880 Hz +/- 12dB

Low Mid: @ 590Hz +/- 13dB

Bass: measured @ 120 Hz +/- 12dB Shelf.

Bass if measured @ 45Hz +/- 16dB Shelf

Enhancer 1khz / +2dB in max right position (CW)

Enhancer 10kHz / +2.3dB in left (ACW) position of control (CW) to +10dB in max right position (ACW)

19.2.3 RANGE - 3 WAY SWITCH (high pass filter)

Slope profile of low frequency roll off: 12 dB per octave.

Rolls off below: 40Hz (bass) / 80Hz. (guitar) / 200Hz (violin/ mandolin / uke)

19.2.4 Phantom Powering of all present and earlier models of EDB. Output XLR does NOT accept 48v

phantom from a mixer, as milliamps power provided is not sufficient to power EDB preamplifier's high performance, multi-function features. If phantom was applied to XLR outputs from a mixer, there would be no damage.

19.2.5 PHANTOM POWER TO IN JACK - SWITCHABLE

In jack socket: 10v or 5v with 10mA Current Limit on ring option or 5K6 Resistor in Series(there is no 5k6 resistor on tip), for tip setting. 3 Way Switch: Off / Ring / Tip

19.2.6 CURRENT DRAW

Minimum = 319mA

+ additional draw if Notch Filter On = 0.2mA

+ additional draw if Phantom Power On = 0.1mA

Maximum total draw = 323mA with red Mute L.E.D on

+ additional Headway HE5 pickup + phantom 10v = 4300uA

+ additional Proel mic CM 602 + phantom 10v = 0.6mA

+ additional Proel mic CM 602 + phantom 48v = 20mA
246mA in standby

+ additional (21mA) draw from whatever microphone or other device is accepting phantom power from EDB-2

VAP short circuit current on phantom 48v - 46mA

(current limit resistors 6k8 on XLR+ pin/ -pin)

current maximum current consumption from 18v power

USB Charging Port : USB 2.0 type A. 5v DC Output

Maximum Current Load = 0.5A (with over-current protection)

Includes Logic on board ~ does not allow use of charging function via batteries

Charger is available only when PSU is powering EDB-2 VAP- **prefer to use in standby mode**

19.2.7 OUTPUT - Line Output via jack: Nominal v RMS @ 150 Ohms Mix of Ch.1 & Ch.2 + Aux In via mono jack socket. (Standard .\" / 6.35mm Diam.)

D.I Balanced Output via XLR Adapter: Nominal v RMS @ 150 Ohms electronically balanced (mono)

XLR IN/Out wiring is standard: Pin 1 = Earth/Ground, Pin 2 = +Signal (Plus), Pin 3 = - Signal (negative)
Noise level (True RMS 20 Hz-20 kHz) At/@ 20 dB gain, EDB-2 VAP produces - dBu. At /@10 dB gain, EDB-2 H.E produces - dB distortion: THD
See: Noise notes 6.1

pic of PSU

19.2.8 POWER SUPPLY UNIT (PSU) - D.C Adapter

Supplied as standard, as required for valve related functions - Mains plug type/territory is determined by primary purchaser

DC Adapter: CE in EU, UL Listed in USA. PSE in Japan

INPUT: 100-240VAC 50/60 Hz @ 100mA+ OUTPUT: 18VDC @ 1A+ N.B. Output power can be higher than 1A without problems as power is drawn from PSU

Input plug connections (L.P.S.): 2.1mm diam. Outer = +VE (Positive) Inner = - VE (negative)

Power Supply Unit with cylindrical magnet encased around output cable will reduce noise figure

PSUs must be regulated, of correct output voltage, polarity and connector and offering sufficient minimum level milliamps or higher. It is not up to Headway to determine the specification or suitability of another Power Supply and any use of a non authorised Power Supply Unit is unlikely to operate correctly and could damage EDB-2 VAP and which would void the guarantee

Mains plug connectors are supplied according to the primary purchaser's territory, such as by a distributor company or dealer as reflects their requirements

Purchasing EDB-2 VAP from a dealer/supplier in a different territory to your own, as grey imports, will usually result in your receiving the mains plug for the dealer's territory.

We do not exchange PSUs internationally, due to excessive costs from shipping, handling, clearance, duty and taxes

If your purchase includes the wrong PSU Plug type you may:

- i) Purchase the correct PSU Adapter from Headway or territorial distributor where in stock
- ii) Use battery backup
- iii) Use a mains plug travel converter
- iv) Discuss options with dealer/supplier where contractual sale occurred. This is NOT the manufacturer's responsibility

Touring musicians may find it useful to retain spare EDB/VAP-PSUs with up to 4 different mains plugs available: UK / North America / EU / AUS & SA

In Japan, a PSU Adapter must carry the PSE mark to operate optimally on 100v

Use only Headway Music Audio supplied 18v PSU. EDB/VAP-PSUs will also power: EDB-1, EDB-2, EDB-2 H.E, EDM-1 & EDM-1 H.E

However, the earlier, smaller EDB/M Power Supply Unit at 0.5A - 0.8A may not power EDB-2 VAP adequately

Headway Music Audio will not maintain guarantees where an incorrect power supply has damaged a pre-amp

19.2.9 WEEE (EU /EEA) Regulations and

Environmental Disposal: power supplies, batteries and pre-amplifiers should never be randomly disposed of in a bin/garbage or sent for landfill disposal. Repair and service pre-amplifiers for long term use and use local recycling and electronics collection schemes

RoHS Regulations (EU/EEA): EDB-2 VAP and other Headway products are made in accordance with RoHS Regulations and are made free of lead and other environmentally damaging substances

20 TROUBLE-SHOOTER CHECKLIST

20.1 AVOIDING ACOUSTIC FEEDBACK & ROOM RESONANCES

Turn the amplifiers, instruments and microphones down and turn off or turn off features, when not in use

Re-angle instruments and microphones to the side of, off axis or behind the speaker cabinets

Re-positioning speakers

Use Notch Filter to hone in on and cut troublesome frequencies

Check that Range control switch is set correctly to remove unwanted low frequency amplification

Use EQ controls to cut frequency of feedback

Covering or blocking the sound hole(s) of an instrument may often help give a few more dBs of level before the onset of feedback

Sound absorbent materials such as drapes and heavy banners in the room may help to damp sound reflections which cause feedback

Where using two pickups or pickup + microphone and feedback is encountered, increase proportion of saddle/bridge pickup or magnetic pickup and decrease proportion of contact pickup or microphone. Or increase proportion of contact pickup and reduce microphone level

Microphones: Avoid omni-directional for live amplification and use uni-directional / hypercardioid

Move source closer to Microphones

Overall levels may be increased by playing harder

Use Mute switches to negate feedback while not playing/instrument on stand

Dampen any strings which will not be in use either with techniques while playing or when left on stand, such as by wedging in plectrums (pics)

The most likely frequency to feedback on a guitar or acoustic bass may be centred around 250-260Hz, which may have the notch filter applied. The most likely guitar string to start resonating into feedback is the 5th (“A”)

An audience in an enclosed performance space will soak up a lot of sound reflections and discourage feedback as if MABS, or Mobile Acoustic Baffles!

Check that a power amp output or headphone output is not plugged into EDB-2 VAP inputs

20.2 UNEVEN STRING AMPLIFICATION, HARSH or BOOMY SOUND?

Use Notch Filter or EQ controls to hone in on and cut troublesome frequencies

If driving the valve or another device into clipping or distortion, back off gain or valve blend and increase Master accordingly

Under saddle pickups may not be fitted or seated correctly and evenly on the instrument. Contact a professional luthier in order to have the installation checked and put right

If a contact pickup is in use, change its placement in order to get the best sound by locating the sweet spot and avoiding honks, resonances and hollowness

If a microphone is in use, change its position to obtain the best balance and overall sound. Guitars often “mic up” best with microphone pointed towards treble strings area of upper bout a little away from sound-hole

If a magnetic pickup is fitted in the sound hole, where possible, adjustment of the magnetic pole pieces (e.g. SAM-1) and overall pickup heights and angles will enable the string balance to be adjusted

20.3 POOR SOUND: WEAK, DULL or DISTORTED?

Ensure that any batteries on pickup systems and pedals are in good condition & Low Battery Indicator LED is not red. (See 9. battery powering.) Alternatively use correct Headway EDB/VAP PSU

Headway EDB/M PSU may work correctly or may not

Turn down Gain control, valve drive control, or excessively boosted EQ controls or engage attenuation switch on some devices (e.g. Pad control on some D.I.s at -15dB)

Avoid Passive D.I boxes (transformers) especially on pickups, which can change or degrade the sound of a pickup due to the way they load it and can add rhythmical load and discharge noises

Check that a power amp output or headphone output is not plugged into EDB-2 VAP inputs (or outputs)

Check leads for cross leakage, excessive capacitance or resistance with an electrical meter or cable tester

20.4 INTERFERENCE & NOISE: HUM, BUZZ, HISS, RADIO?

Keep your EDB-2 VAP and signal cables away from devices with strong magnetic fields, or mobile/cellular phones. These include large AC mains transformers,

generators, lighting control systems, refrigeration, air conditioning and non earthed fluorescent lighting

Switch off equipment which is causing interference

Keep signal cables away from mains and speaker leads

Check mains power leads are not coiled

Use highly screened microphone or instrument leads, with metal shielded connectors and good connections

Shorten or uncoil cable runs

Unplug power supply and try using batteries - Use correct Headway Power Supply Unit

When using the XLR to jack adaptor for a D.I output, set the Earth/Gnd Lift switch to cut earth loop hums if required. Otherwise leave Earth Lift switch Off
Use Notch Filter with narrow "Q" to hone in on troublesome hum and cut it (at around 50-60Hz) or cut fluorescent light buzz (at around 100-130 Hz)

Use mains filters to prevent noise transmitting through mains power, which can affect amplifiers

If lighting is causing hum and/or buzz, power your amplifier from a different AC mains ring that is not being used for stage facilities or lighting

Hum and buzz can be generated in a stringed instrument where there is no earth connection between output jack, strings or any tail piece. A luthier might connect these parts using a wire

Acoustic buzzes on instruments may be confused with electrical buzzes. To check the source or cause, unplug instrument and play it hard acoustically

Excessive hiss will normally be produced by a faulty, poor quality, or noisy device in the chain or by imbalances between different gear. To reduce hiss, identify gear responsible and remove. Or play harder and increase signal into it, while reducing its own gain and increasing gain further on in any chain of devices

Turn off unused mixer channels. Radio interference within the signal may be caused by the use of poor quality leads such as curly leads, especially where high impedance and low output passive pickups are used. To avoid, use highly screened jack leads into inputs or use active pickups

Use only current government licensed, type approved, multi-channel radio microphones and radio transmitters

of good quality. We recommend you use only western branded radio microphones purchased in your territory and with valid guarantees. If noise or broadcast radio interference is experienced, change for conventional microphones and highly screen leads. You may find Radio Microphones unusable near airports and similar facilities

Try unplugging digital device to USB Charger
See NOISE NOTES 6.1

20.5 INTERMITTENT or LACK OF SIGNAL?

Check that all connectors are pushed firmly into their sockets

Do NOT leave switches in mid position between settings as this could make preamplifiers inoperative until set positively

Jack sockets and XLRs need to be kept clean or can short out functions. Send & return jack sockets may be the first connectors to deserve attention and if dirty these can make channels inoperative. Apply switch cleaner with lubricant, WD40 or the like, on the probe and plug in and out repeatedly for 30 seconds to clear the socket

Check that Power switch is ON, Mute is OFF, Gain control(s) and Master are turned up and Jacks are fully home. Also check that your other gear is on and turned up

Check that controls and switches are not faulty and shorting out, by moving them too and fro, applying a small amount of switch cleaner to their bases and seeing if the fault ends in different positions

Ensure batteries are in good condition and connectors on the correct way around Ensure PSU is properly plugged in at both ends. Warning L.E.D light indicates less than a 7.3v charge per battery

Check that battery connector terminals (+ -) are in place, pinched on tight and in good condition

If EDB-2 VAP has become overheated, turn off, cool it down and try turning on a little later to restart, checking leads and connected devices

Check if batteries are hot and then remove/change. Or change power source to either DC PSU, or battery use. If this occurs more than once, refer to Headway Music Audio or approved electronics technician

Check under Valve cover that Valve is in place at correct 12AX7 specification, connected to it's base with all terminals plugged in and that the Valve lights up when EDB-2 VAP and valve switch are switched on and are powered by correct EDB-VAP/PSU Power Supply

Use a meter/cable tester to check jack leads and solder connections for resistance, capacitance, cross bleed and good connection

Make sure jack probes are straight and that the tip contacts are not misshapen in any way

Check that XLR leads are wired correctly as standard.
See: Electrical Specifications 19.2

If a socket is set too deeply recessed into an instrument may not make effective contact with the plug

Check that mains supply is operating in chain of power supply with earth connected at all points. Alternate between Power Supply Unit and batteries to find a fully working option

It is recommended the best quality of connectors be used. We recommend using quality products: ST Professional, Neutrik, Deltron & Schurter, Switchcraft & GH. Headway offers quality jack leads with appropriate lengths and specifications

USB Charger. If not functioning, check USB 2.0 Type A leads are fully plugged in and Power Supply Unit is Headway supplied 1A version and connected live.
See: Electrical Specifications 19.2.6

Charger will not work from the EDB-2 VAP batteries

20.6 PERSISTENT PROBLEMS If you have worked through the Trouble Shooting and problem prevention areas above and you still experience persistent problems and require help, please contact your dealer, a professional electronics technician or Headway Music Audio where applicable and we will attempt to help where it applies to our products

HEADWAY LATEST NEW PRODUCTS

New **Everlux Long Life Acoustic Strings**



Nano Coated Phosphor Bronze by Headway Music Audio
Ltd (UK)

Rich complex Tone with Harmonic Sparkle

UK Voiced & USA made Materials

Stable Tuning and correct tensioning

Smooth Feel

Nickel Plated Hexagonal Steel Core

Fast Access Single String Paper packets ~ Anti
Condensation

Phosphor Bronze strings retain brightness and avoid
corrosion longer than Bronze or Brass

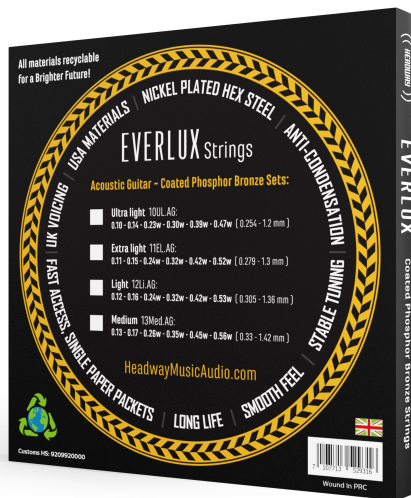
Nano Coated Strings last far longer on tone and beating
corrosion than non coated standard strings

10"s ~ Ultra Light. 10UL.AG: 0.010 - 0.014 - 0.23w -
0.030w - 0.039w - 0.047w (0.254mm - 1.2mm)

11's ~ Extra Light. 11EL.AG: 0.011 - 0.015 - 0.024w -
0.032w - 0.042w - 0.052w (0.279mm - 1.3mm)

12's ~ Light. 12Li.AG: 0.012 - 0.016 - 0.024w - 0.032w -
0.042w - 0.053w (0.305mm - 1.36mm)

13's ~ Medium. 13Med.AG: 0.013 - 0.017 - 0.026w -
0.035w - 0.045w - 0.056w (0.33mm - 1.42mm)



All Materials recyclable for a Brighter Future!

EDM-1 H.E Equaliser Direct Mini – ultra compact 1 Channel EQ Pre-amp with comprehensive new features including tuneable range filter, Phase Reverse, Earth Lift and D.I Output with 3 Band EQ, Send and Return via Insert Point and Harmonic Enhancer switch with improved pro audio sound quality, plus sturdy metal enclosure, supplied with 2 adapters. “PLUS Version“ has 18v PSU and offers a condenser mic friendly DC Adapter powering and additional XLR – jack adapter



EDB-2 H.E - Equaliser Direct Blend with Harmonic Enhancer



HE5 (e.g HE5/G.FEQ) - Active Under Saddle Pickup,
Newly Improved harmonically enriched tone for steel
strung acoustic guitar. Also versions for mandolin,
bouzouki, nylon strung guitar, acoustic bass etc



The Band2 - Newly improved bowed Instrument popular “instant fit” wrap around, passive body pickup. (Available for violin, viola, cello & double bass and violin 1/2 & 3/4 sizes). Band2 offers a larger, fuller sound with greater clarity

HEADWAY FORTHCOMING NEW PRODUCTS

Due for release 2023-4:

SuperBug / MicroPure Microphones : Range of modular active contact pickup systems with multiple maple encased pickups, superior fixed EQ, filtered & harmonically enhanced pre-amplifier and other pickup "additional channel blend" facility with superior MicroPure / AirShield silicone condenser miniature microphones

with innovative mountings and housings

MicroStage & MicroJam - Innovative compact acoustic combos & acoustic/electric bass combo combo amplifiers – 2024

Headway Existing Products include:

Sheer Acoustic Magnetic SAM-1 : Active magnetic sound hole pickup – superior fixed EQ, Filtered and enhanced pre-amplifier. Easy fit for superior natural steel strung sound

Snake3 (e.g. Snake3 AG) - Active under saddle pickup for steel strung acoustic guitar . Versions for other stringed instruments

Elegant Rosewood "Clamp Jack" - available for violin and viola

HEADWAY POLICY OF CONTINUOUS IMPROVEMENT

Headway Music Audio Ltd. operates a policy of continuous improvement and reserves the right to alter specifications, components and prices without prior notice.

Validate your guarantee only by registering it online within 30 days of purchase on Headway website.

We recommend that to get the best possible sound, you use only Headway pickups and good quality microphones

Headway Music Audio Returns/Repairs - 2023

Glympton Post Office
Glympton,
Woodstock,
Oxfordshire,
OX20 1AL
UK

N.B. PLEASE CHECK WEBSITE FOR POSSIBLE AMENDMENTS ON RETURNS ADDRESS

www.headwaymusicaudio.com

EDB-2 V.A.P:

EAN Product Codes:
EDB-2 VAP: 7107716990885

Headway Music Audio Ltd

VAT Tax number: GB 924 7711 16
EORI number: **GB 924771116000**
Company Registration No: 05685289.

Customs Classification Code for Returns:

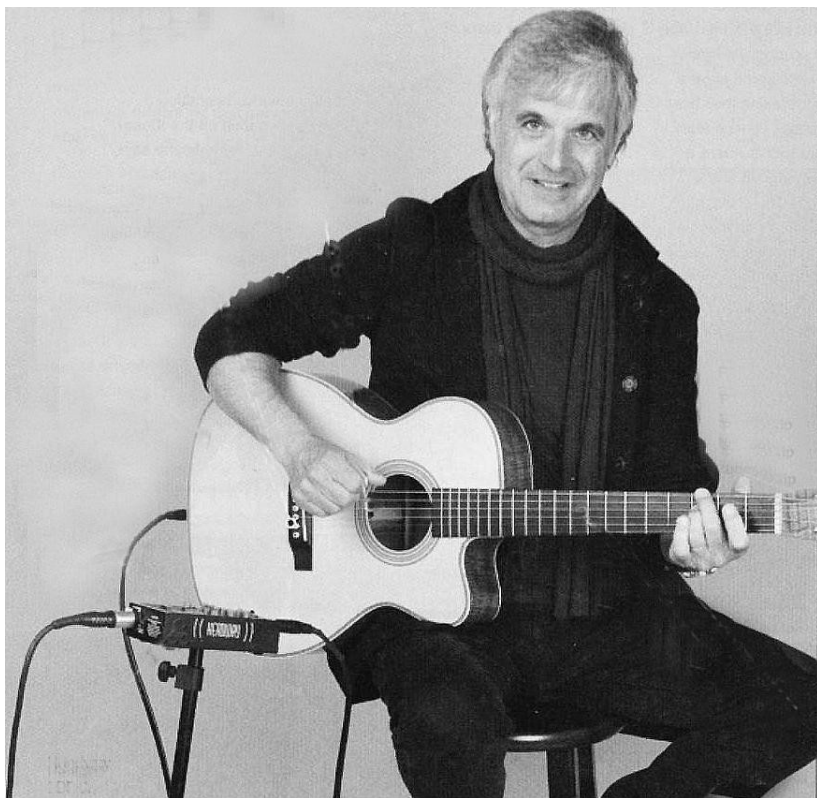
All EDB & EDM Pre-amplifiers are classified as “electrical amplifiers”

HS: 8518.10.40

**MAKING INSTRUMENTS LOUDER
SINCE 1995**

**The British Acoustic Specialists
HEARING WAY AHEAD!**

© 2023 Headway Music Audio Limited



Lawrence Juber pictured with Headway EDM-1 Pre-amp mounted via integral Microphone Stand Bracket.

[illegible]

This image shows a full page of a notebook or worksheet template. It consists of approximately 20 horizontal rows. Each row is defined by two short, parallel dashed lines, creating a series of uniform gaps for handwriting practice. The entire page is otherwise blank, with no margins, text, or other markings.