

# ALLEN&HEATH



## **Xone:23C**

### USER GUIDE

Publication AP9433\_1

## **Limited One Year Warranty**

This product is warranted to be free from defects in materials or workmanship for period of one year from the date of purchase by the original owner.

To ensure a high level of performance and reliability for which this equipment has been designed and manufactured, read this User Guide before operating. In the event of a failure, notify and return the defective unit to ALLEN & HEATH Limited or its authorised agent as soon as possible for repair under warranty subject to the following conditions

### **Conditions Of Warranty**

The equipment has been installed and operated in accordance with the instructions in this User Guide.

The equipment has not been subject to misuse either intended or accidental, neglect, or alteration other than as described in the User Guide or Service Manual, or approved by ALLEN & HEATH.


Any necessary adjustment, alteration or repair has been carried out by ALLEN & HEATH or its authorised agent.

This warranty does not cover fader wear and tear.

The defective unit is to be returned carriage prepaid to ALLEN & HEATH or its authorised agent with proof of purchase.

Units returned should be packed to avoid transit damage.

In certain territories the terms may vary. Check with your ALLEN & HEATH agent for any additional warranty which may apply.

 This product complies with the European Electromagnetic Compatibility directives 2004/108/EC and the European Low Voltage directives 2006/95/EC.

Any changes or modifications to the equipment not approved by Allen & Heath could void the compliance of the product and therefore the users authority to operate it.

XONE:23C User Guide AP9433 Issue 1

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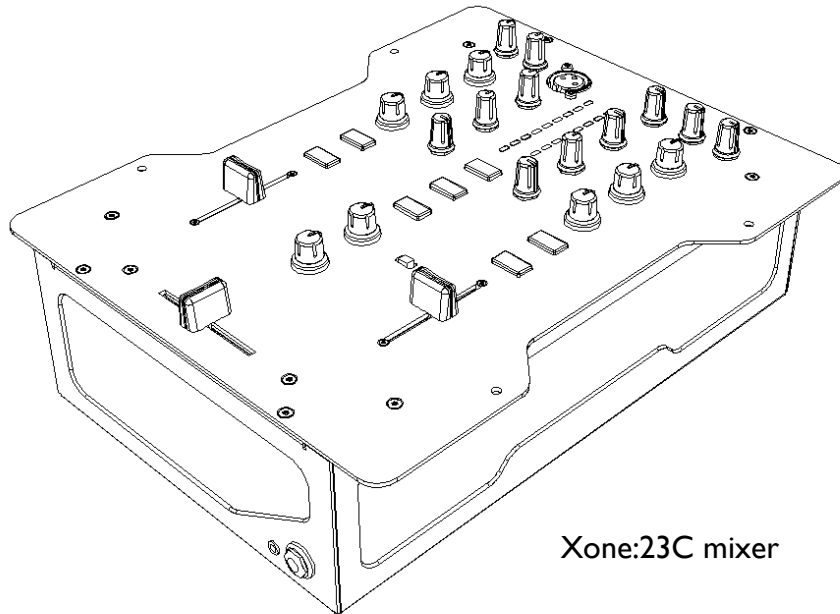
Allen & Heath Limited

Kernick Industrial Estate, Penryn, Cornwall, TR10 9LU, UK

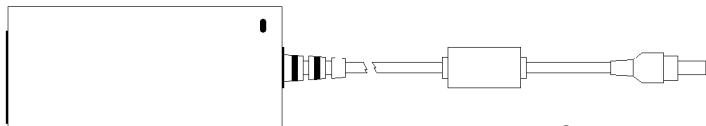
<http://www.allen-heath.com> <http://www.xone.co.uk>

# PACKED ITEMS

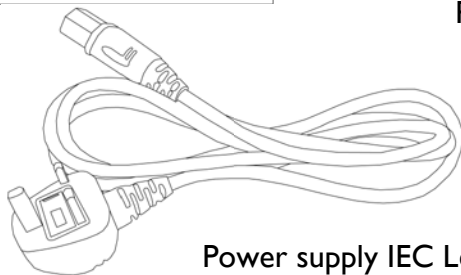
Check that you have received the following:



Xone:23C mixer

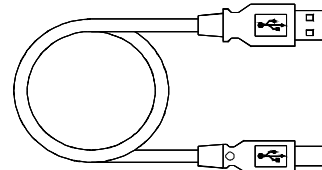


Power Supply  
12V - 2.5 Amps



Power supply IEC Lead

This is country specific and will vary with mains voltage/territory



Type A-B USB Lead

To connect the Xone:23C to your computer.



Two 17cm, three-way harnesses.

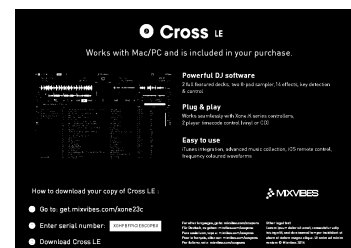
These are to configure the soundcard for DVS - see page 19



Safety Sheet

**Important !** Read this sheet before starting.

Retain for future reference.



MixVibes Software Voucher

This contains the license number that allows you to download and use Mixvibes with your Xone:23C

# CONTENTS

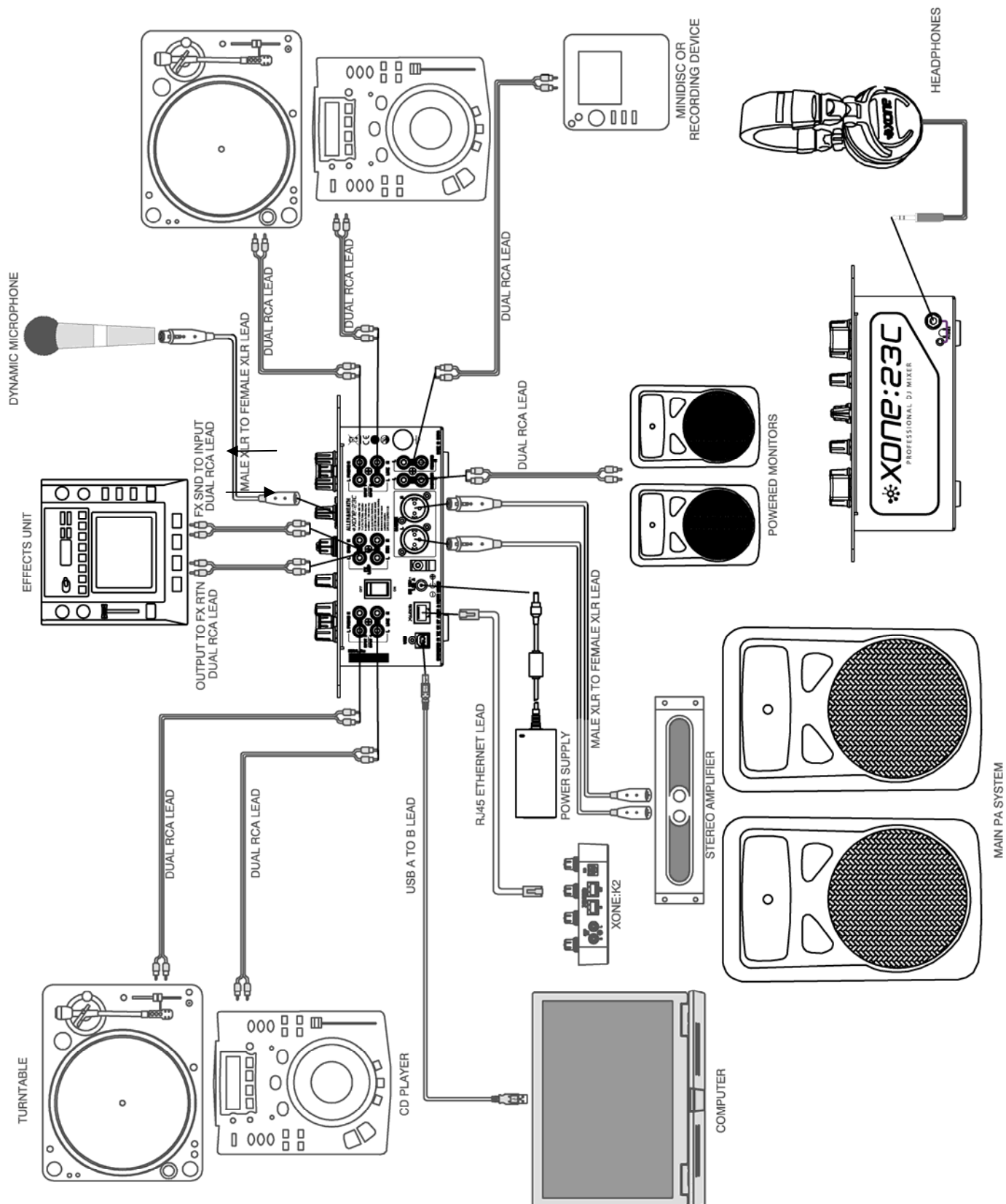
Congratulations on purchasing the Allen & Heath Xone:23C performance DJ mixer. To ensure that you get the maximum benefit from the unit please spare a few minutes familiarizing yourself with the controls and setup procedures outlined in this user guide. For further information please refer to the additional information available on our web site, or contact our technical support team.

<http://www.xone.co.uk>

<http://www.allen-heath.com>

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# APPLICATION DIAGRAM



# INTRODUCTION TO THE XONE:23C

The Xone:23C is a high performance 2+2 channel VCA mixer designed around the latest analogue circuitry, with microprocessor control of all signal routing and featuring a high specification USB soundcard, incorporating an X:LINK control interface port.

It is equipped with a version of the classic Xone filter system, a 3 band “Kill Type” EQ Isolator, plus a send/return loop for external effects.

The crossfader curve has two settings, suitable for beat matching, or a more aggressive curve for scratching. For ultimate crossfader performance the mixer can also be equipped with a custom Innofader, available from your nearest Allen & Heath stockist, (part number 004-504JIT).

With a studio grade 20dB of signal headroom, a separate booth monitor and balanced XLR main outputs, (with an impressive +28dBu max level) the Xone:23C is ideal for the DJ who requires a high quality compact mix tool that easily interfaces with all leading DJ software.

Some key features of the Xone:23C:

- Four channel stereo 24bit/96kHz USB soundcard with X:LINK
- Classic Xone Voltage Controlled Filter system
- Up to four sources can be mixed simultaneously
- Kill-type three Band, full cut equalizer
- Dedicated booth Monitor
- Outputs on professional standard balanced XLR connectors
- Four inputs (2+2 stereo channels) with dual levels for phono/line inputs
- FX Send/Return loop
- Innofader crossfader option
- Accurate signal level monitoring with peak hold
- +28dBu maximum output level (balanced XLR)
- High internal headroom (+20dB) to prevent overload
- Universal voltage power supply (works anywhere in the World)
- Twin headphone sockets (1/4” and 3.5mm)
- Separate record output on RCA
- Negligible signal distortion (typically 0.01% at +10dBu output)
- UV sensitive ink screen for improved low light legibility
- Cue-mix control with illuminated Cue switches
- Crossfader curve switch

We wish you the same fun playing on it as we have had designing it!

<http://www.xone.co.uk>

<http://www.allen-heath.com>

# INPUT CHANNEL CONTROLS

## Input level controls

Adjust so the average music level lights the 0 LED on the meter, with the beats lighting the +3 to +6 LED. Turn down if the +10 Red LED is illuminated. Each input has its own separate level control, so make sure to fully turn down (anticlockwise) the input you don't want feeding into the channel.

## 3-Band full kill EQ

Turn anti-clockwise to kill a frequency band or clockwise to boost.

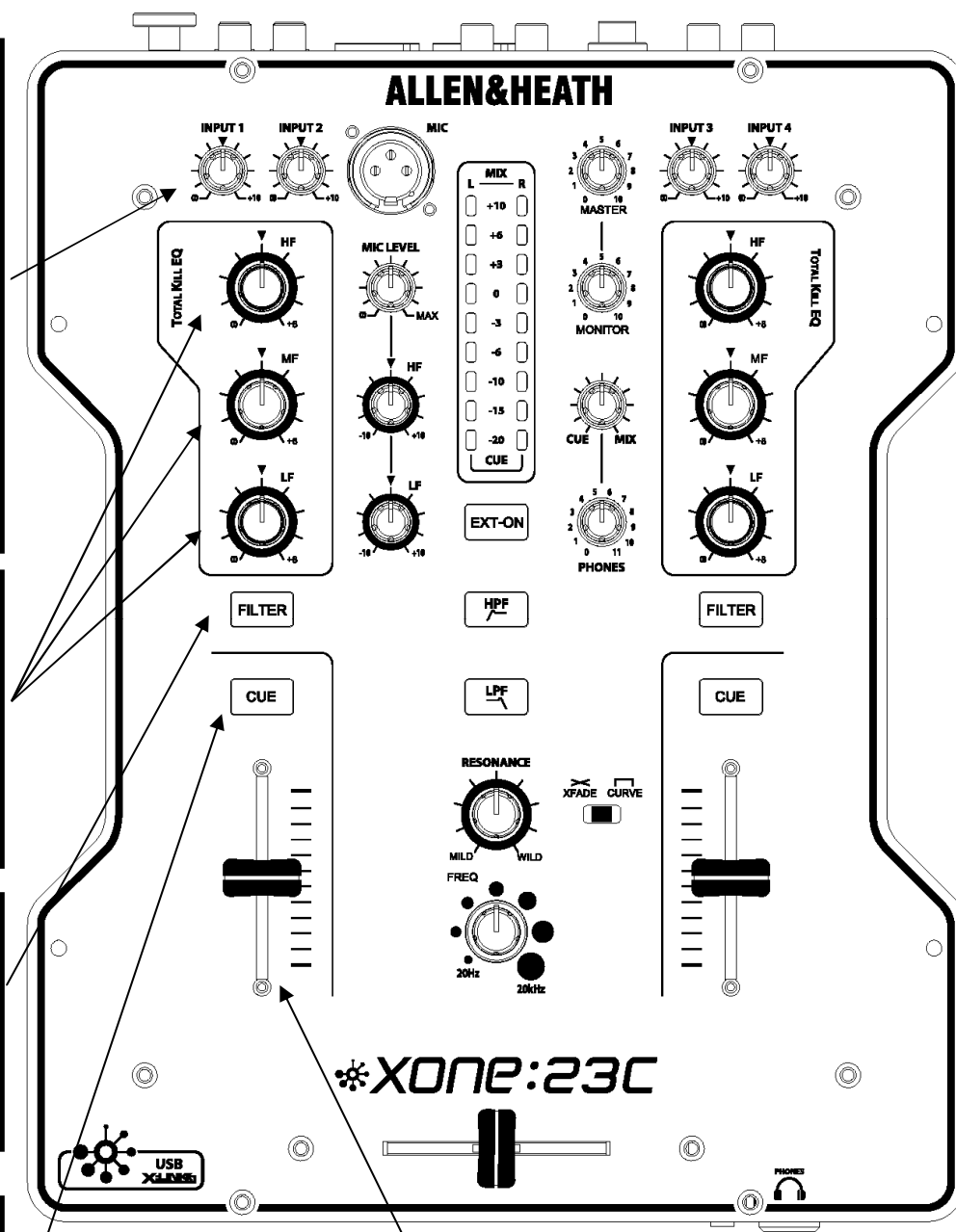
If all controls are fully anti-clockwise the signal will be muted

## Filter/FX SND switch

Pressing this switch sends the channel signal to the VCF filter section, **and to the external effects SND output**

## Channel Cue switch

Pressing this switch allows you to monitor the channel signal with the fader fully down before bringing it into the mix.

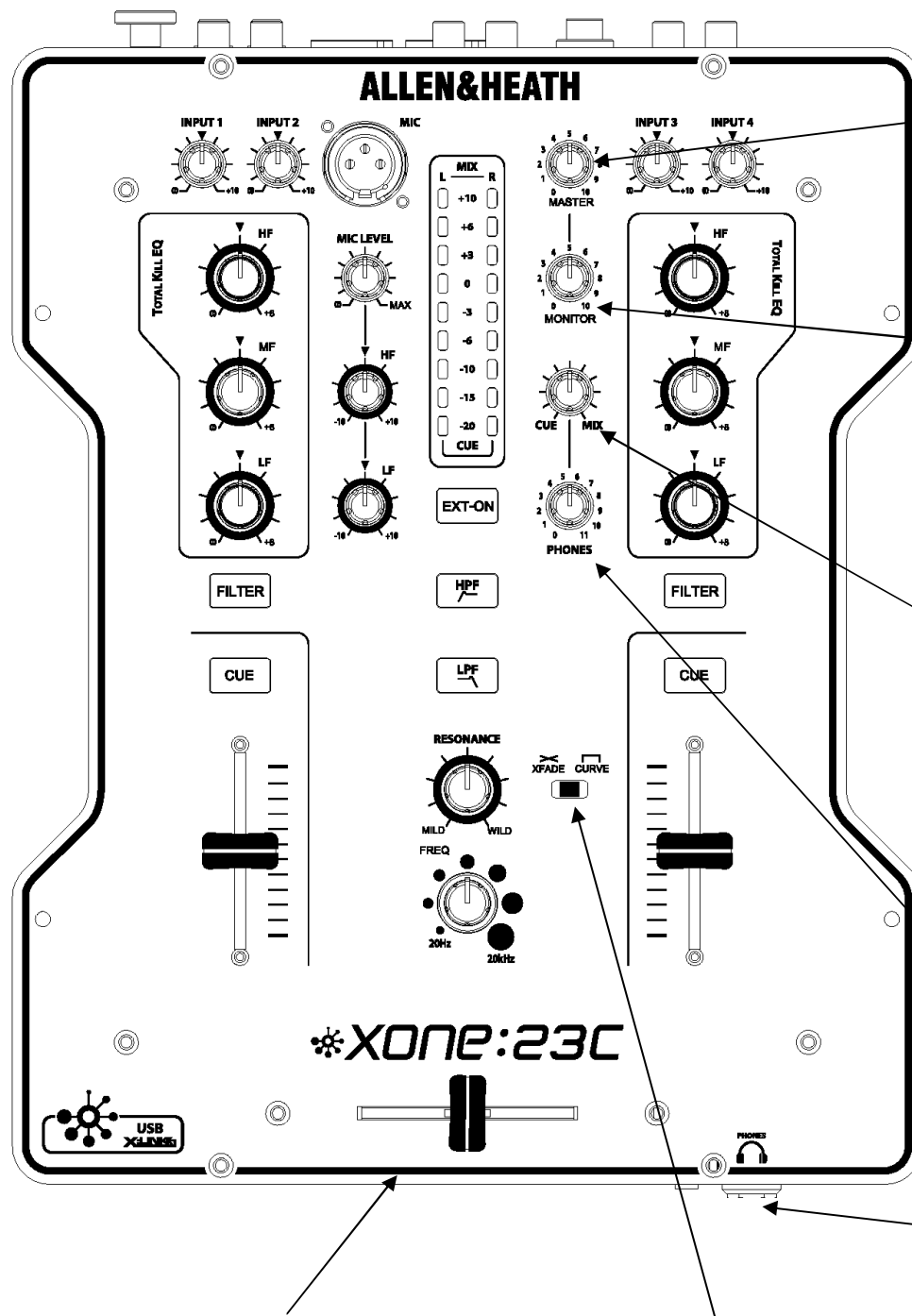


## Channel Fader

VCA fader allows you to progressively raise or lower the channel signal in the mix.

For best signal-to-noise ratio, mix with the fader at or near the top of its travel

# MASTER CONTROLS



## Master output Level

Sets the signal level to the main XLR mix output

## Monitor output Level

Sets the signal level for the local monitor (booth) output

## Cue/Mix Control

When set to Cue, nothing will be sent to the headphone output unless a channel Cue is activated. When set to Mix, the main mix will always be sent to the headphones. In the centre position the Cue signal and the main mix are summed together.

## Headphone level

Sets the level of the headphone output.

Warning! Very high level can cause hearing damage!

## Headphone Sockets

Twin sockets for both 1/4" and 3.5mm plugs. Use a good quality set with an impedance between 25 - 70 Ohms.

## Crossfader

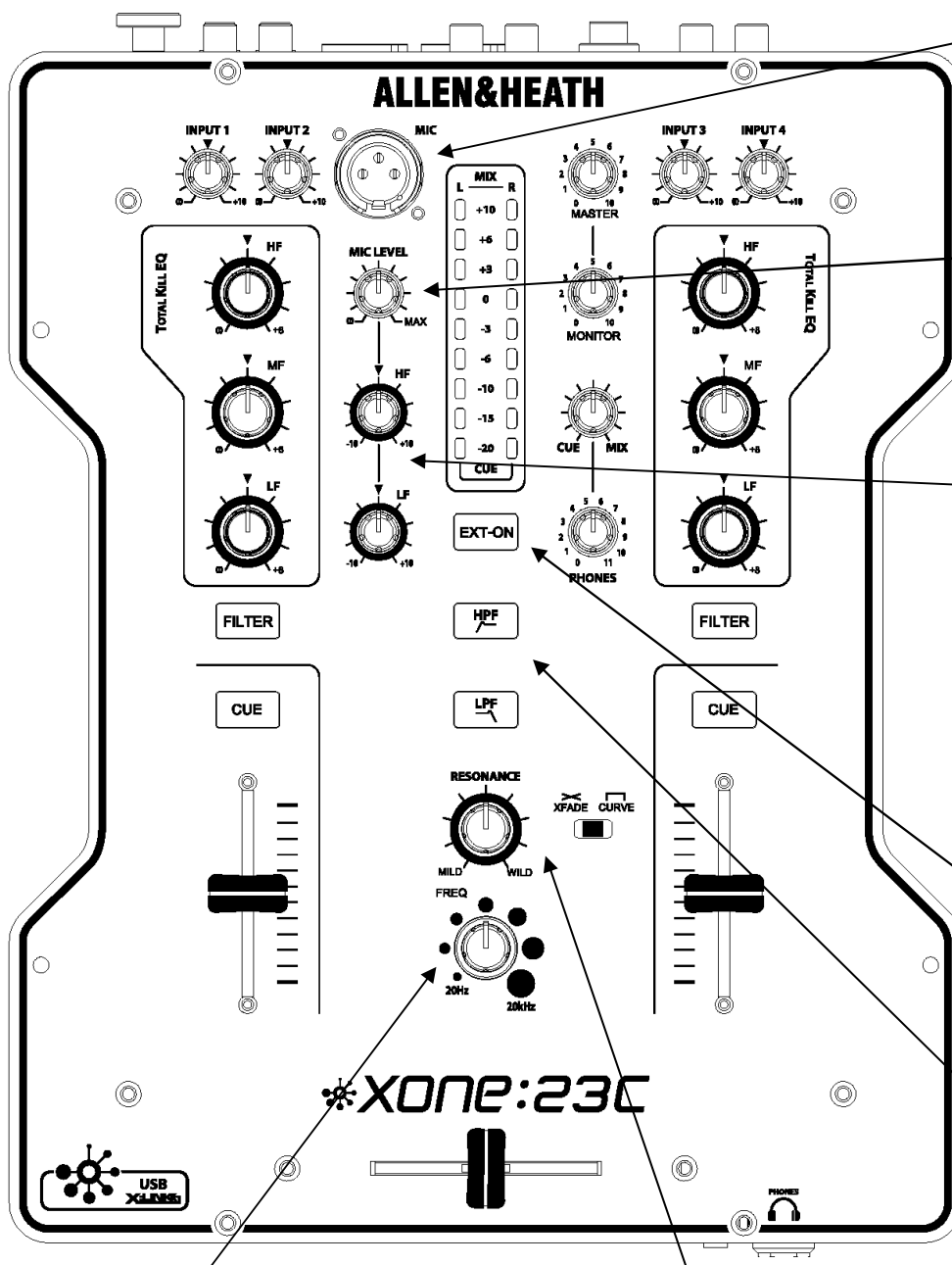
This is used to "fade" the signal level between the two channels, and its response is set using the curve switch. When the crossfader is fully over to the left only the music from channel 1 will be heard, and when fully to the right only channel 2. When in the centre the music from both channels will be heard in equal proportion.

## Crossfader curve switch

Push to the left for a progressive fader response, useful for blending between tracks. Push to the right for a sharper response, more suitable for scratching



# MIC AND FILTER CONTROLS



## Microphone input

Professional XLR balanced mic input. Use a low impedance dynamic hypercardioid Mic for best results.

## Microphone Level

Adjusts the signal level of the mic input. If you are not using the mic, turn to minimum to prevent noise pick up.

## Microphone EQ

2 band EQ for adjusting the tonal balance of the DJ mic

## FX loop on switch

Press this switch to activate the external effect loop. Leave switched off if an external effects unit is not connected

## Filter Frequency

Sets the cut off frequency of the VCF filter

## Filter Resonance control

Changes the "Q" or sharpness of the VCF.

Mild will give a smooth filter sound, Wild will make the filter sound more pronounced (sharper "Q")

## Filter type select

HPF - allows signals above the cut-off frequency to pass.

LPF - allows signals below the cut-off frequency to pass

# REAR PANEL CONNECTIONS

## Line input

For connection to a line level device; (CD players etc)

## Phono inputs

For connection to turntables only; this input has RIAA equalization for moving magnet cartridges.

Note: An internal modification can convert these to Line (see page 18)

## Line input

For connection to a line level device; (CD players etc)

## Effects SND output

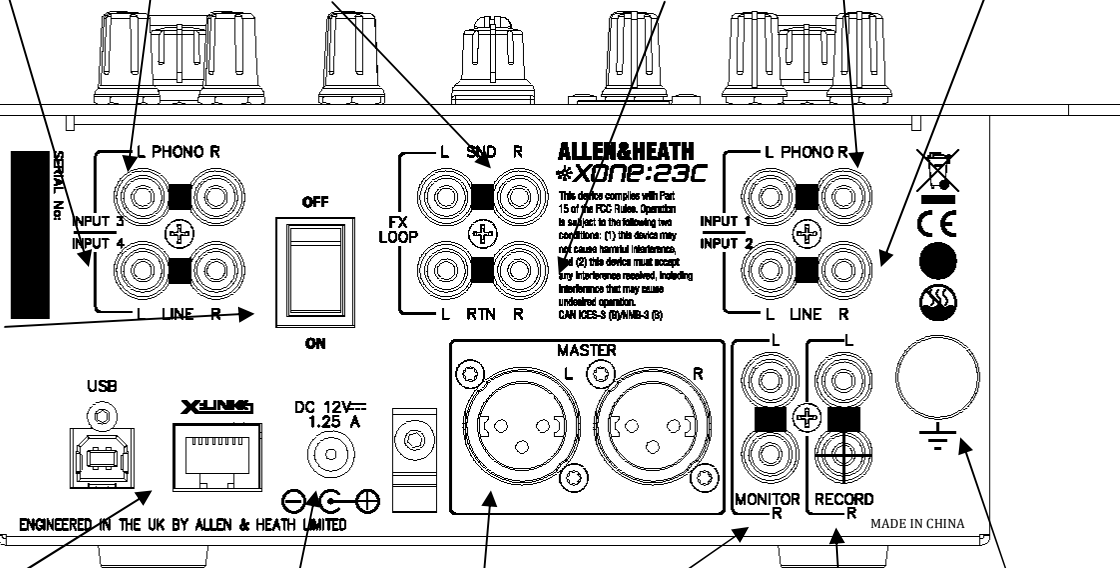
Connect this output to the input of an external effects unit.

## Effects RTN input

Connect this input to the output of an external effects unit.

## Power Switch

Switches the unit On/Off



## USB and X:LINK

Connect USB to a computer to stream audio files or to record the output of the mixer into software.

Connect the **X:LINK** socket to any compatible Allen & Heath controller to enable MIDI data to be passed to the computer.

## Monitor output

Connect to a powered speaker or Hi-Fi system

## Grounding post

Connect the ground wire from turntables (if fitted) to minimise hum

## Main outputs

Connect these to a PA amplifier using professional balanced XLR connectors for maximum hum and noise rejection.

**Do not short either pins 2 or 3 to ground. For unbalanced operation use pin 2 only and leave pin 3 floating.**

**Failure to observe this could result in damage to your Xone:23C**

## Record output

Use to record your mix. Connect to a Minidisk recorder or computer soundcard input etc

## PSU connection

To prevent damage to your Xone:23 only use an A&H approved power supply

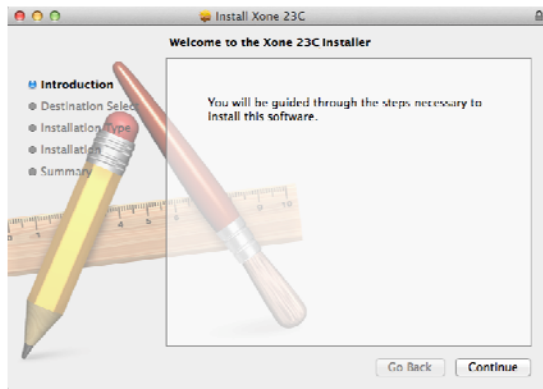
# Driver installation Mac

## Drivers

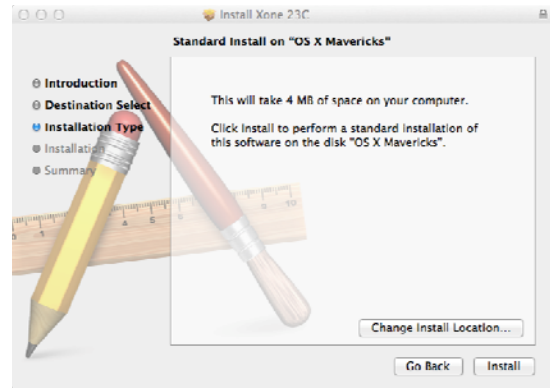
Although the Xone:23C is class compliant and will work on a Mac without drivers, for best performance we recommend you download the dedicated drivers from our website:

[www.allen-heath.com/xone23cdrivers](http://www.allen-heath.com/xone23cdrivers)

When the drivers have downloaded, extract them to a folder and click on the .dmg file to start installation:



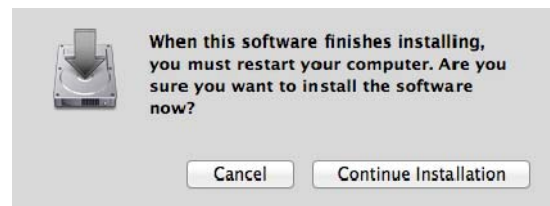
Click Continue



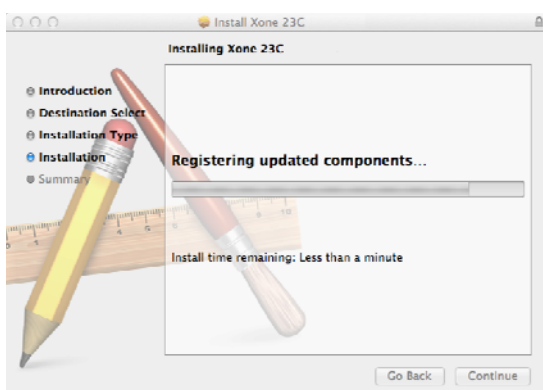
Click Install



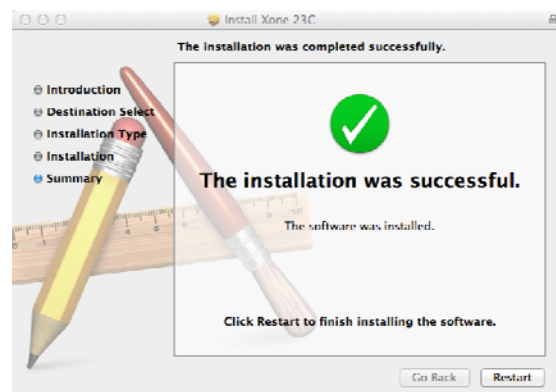
Enter your user name and password then click install software



Click Continue Installation



When the installation finishes, click continue



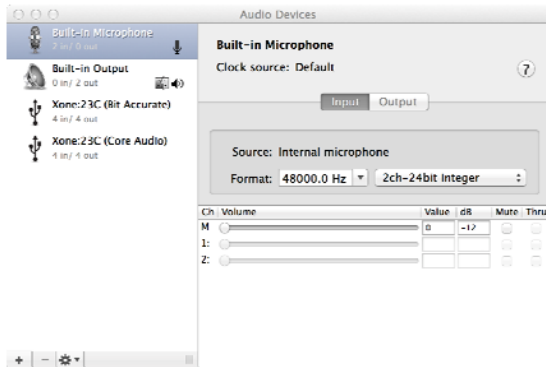
And restart your computer when prompted

Installation is complete and your computer will connect and recognise your Xone:23C as an audio and MIDI device.

# Driver installation Mac

## Checking the Audio MIDI Setup

To confirm that the Xone:23C is properly installed or to configure the Audio or MIDI. With the mixer switched on and connected to your computer, open the AUDIO MIDI utility - (to find this utility type "Audio MIDI" into spotlight (the magnifier at the top left of the desktop) and follow the links.



The driver offers two modes of operation: Bit Accurate and Core Audio.

**Bit accurate** - in this mode the Xone:23C controls the audio clocks and provides the lowest latency and least jitter. We recommend working in this mode for best performance.

**Core Audio** - In this mode the driver is fully class compliant and will allow aggregation with other soundcards connected to your computer, but will have slightly higher latency and clock jitter.

Selecting either driver will bring up the devices properties and will allow you to configure the sample rate and input/output routing. The sample rate can be set from 44.1kHz up to a maximum of 96kHz. If you mostly play commercially available music files it is recommended that you set the sample rate to 44.1kHz as this will save the replay software from have to perform sample rate conversation which can create low level artefacts.

## MIDI



You can confirm that the Xone:23C is also set as a MIDI device by selecting MIDI Studio where the mixer's icon will be listed.

## X:LINK

The Xone:23C does not send any MIDI on its own, however it is fitted with an A&H proprietary interface called X:Link. This will allow you to connect an Allen & Heath controller (such as the Xone:K2) to the mixer which will both provide power to the device and pass MIDI up the USB connection.

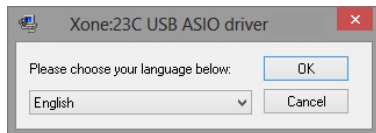
# Driver installation PC

## Drivers

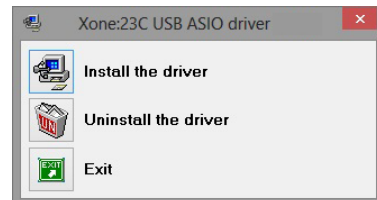
In order to access all the soundcard channels on your Xone:23C you will need to install the dedicated ASIO driver, which can be downloaded from our website:

[www.allen-heath.com/xone23cdrivers](http://www.allen-heath.com/xone23cdrivers)

When the drivers have downloaded, extract them to a folder and click on the setup file to start installation:



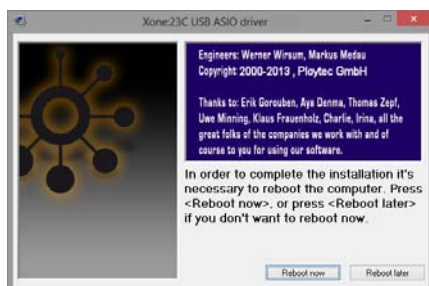
Choose your language and click OK to continue



Click Install the driver



During the installation you will twice be asked to unplug and re-plug the USB audio cable to your Xone:23C



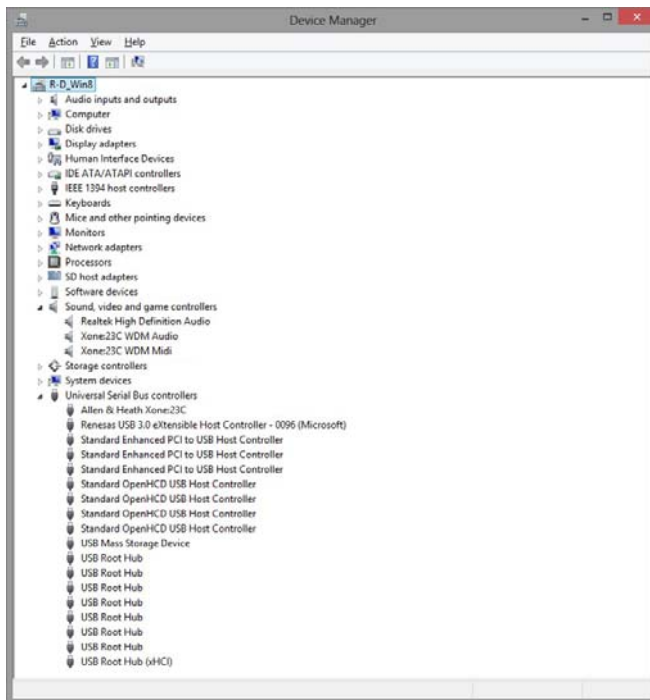
Restart your computer when prompted

Installation is complete and your computer will now connect and recognise your Xone:23C as an audio and MIDI device.

# Driver installation PC

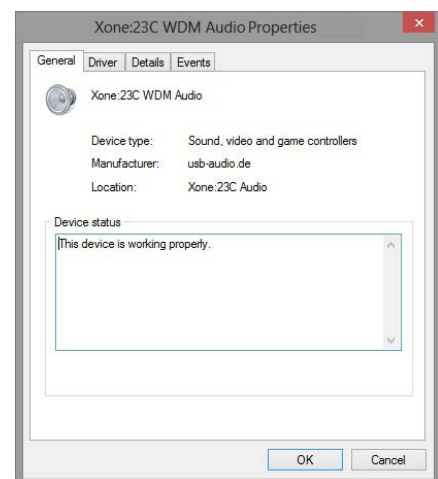
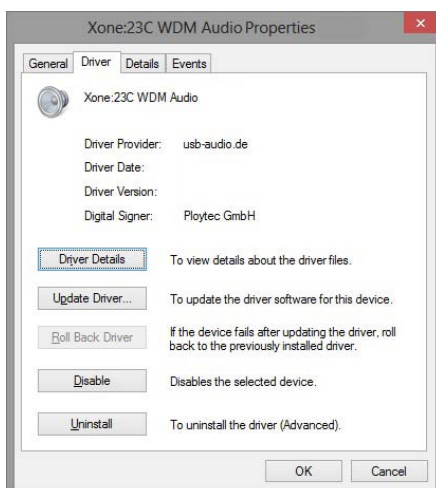
## Checking the Audio MIDI Setup

To confirm that the Xone:23C is properly installed open Windows Device Manager (click on the start button, then right click “computer” and select “properties”, then select “Device Manager”)



The Xone:23C should be listed under “Sound, video and game controllers” as both an audio and MIDI device, and will also be listed under USB controllers.

To check the driver version, double click the Xone:23C WDM driver icon to bring up the “properties” box.



Select the driver tab to see details of the driver version.

# FILTER REFERENCE

## The VCF Filters

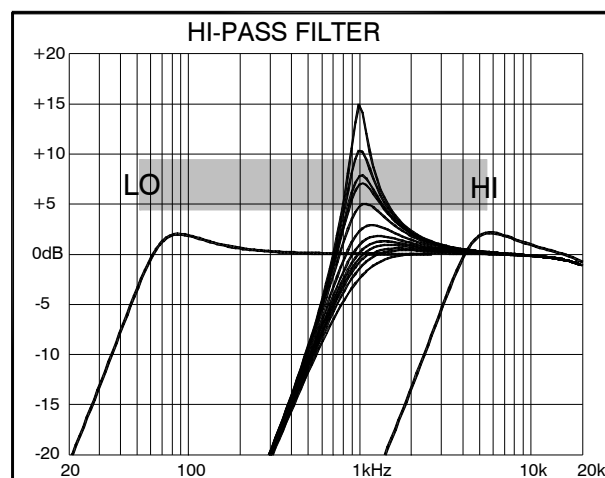
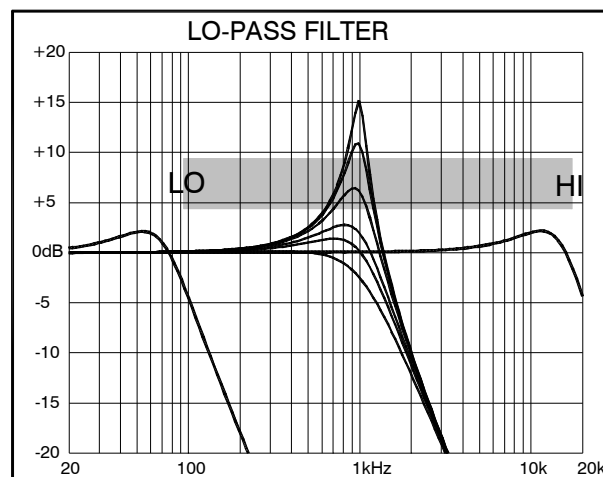
A voltage controlled filter is an audio filter where the cut-off frequency is altered by a DC control voltage rather than a variable resistor. This produces a much wider operating range and more control over the filter response to create unlimited combinations of tonal effect.

## Filter Type Select

The filters provide two simultaneous filter types: high-pass, and low-pass. Large illuminated switches select which type is active.

The graphs below show the effect on the audio frequency response for the two filter types. The range of sweep from low to high frequency is shown together with the effect of adjusting RESONANCE.

The vertical scale shows the amount of cut or boost around the normal 0dB operating level. The horizontal scale shows the change in frequency from low (bass) to high (treble).



# OPERATING LEVELS

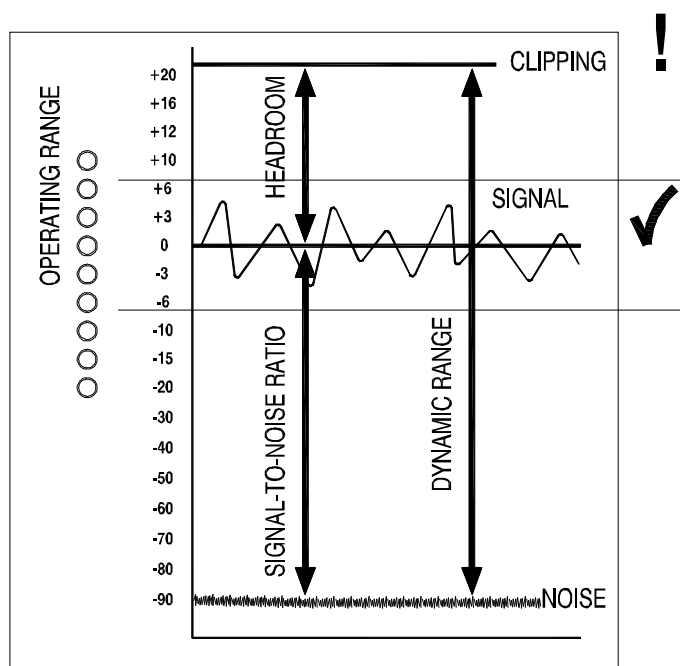
It is most important that the system level settings are correctly set. It is well known that many DJs push the level to maximum with meters peaking hard in the belief that they are getting the best from the system. **THIS IS NOT THE CASE !** The best can only be achieved if the system levels are set within the normal operating range and not allowed to peak. Peaking simply results in signal distortion, not more volume. It is the specification of the amplifier / speaker system that sets the maximum volume that can be achieved, not the console. The human ear too can fool the operator into believing that more volume is needed. Be careful as this is in fact a warning that hearing damage will result if high listening levels are maintained. Remember that it is the **QUALITY** of the sound that pleases the ear, not just the **VOLUME**.

The diagram below illustrates the operating range of the audio signal.

**NORMAL OPERATING RANGE.** For normal music the signal should range between -6 and +6 on the meters with average around 0dB. This allows enough **HEADROOM** for unexpected peaks before the signal hits its maximum **CLIPPING** voltage and distorts.

It also achieves the best **SIGNAL-TO-NOISE RATIO** by keeping the signal well above the residual **NOISE FLOOR** (system hiss).

The **DYNAMIC RANGE** is the maximum signal swing available between the residual noise floor and clipping.



## An important note ...

The human ear is a remarkable organ with the ability to compress or 'shut down' when sound levels become too high. Do not interpret this natural response as a reason to turn the system volume up further! As the session wears on ear fatigue may set in, and the speaker cones may become hot, increasing distortion and reducing the ability of listeners to gain any benefit from increased volume.



# EARTHING

The connection to earth (ground) in an audio system is important for two reasons:



**SAFETY** - To protect the operator from high voltage electric shock, and

**AUDIO PERFORMANCE** - To minimise the effect of earth (ground) loops which result in audible hum and buzz, and to shield the audio signals from interference.

For safety it is important that all equipment earths are connected to mains earth so that exposed parts are prevented from carrying high voltage which can injure or even kill the operator. It is recommended that a qualified system engineer check the continuity of the safety earth from all points in the system including microphone bodies, turntable chassis, equipment cases, and so on.

The same earth is also used to shield audio cables from external interference such as the hum fields associated with power transformers, lighting dimmer buzz, and computer radiation. Problems arise when the signal sees more than one path to mains earth. An 'earth loop' (ground loop) results causing current to flow between the different earth paths. This condition is usually detected as a mains frequency audible hum or buzz.

To ensure safe and trouble-free operation we recommend the following:

**Have your mains system checked by a qualified electrician.** If the supply earthing is solid to start with you are less likely to experience problems.

**Make sure that turntables are correctly earthed.** A chassis earth terminal is provided on the console rear panel to connect to turntable earth strips.

**Use low impedance sources** such as microphones and line level equipment rated at 200 ohms or less to reduce susceptibility to interference. The console outputs are designed to operate at very low impedance to minimise interference problems.

**Use balanced connections for microphones and mix output** as these provide further immunity by cancelling out interference that may be picked up on long cable runs.

Do not unbalance the Xone:23C XLR outputs by shorting pin 3 to ground as this may damage the circuitry; for unbalanced operation connect the hot signal to pin 2 and the ground to pin 1. Leave pin 3 floating.

**Use good quality cables and connectors** and check for correct wiring and reliable solder joints. Allow sufficient cable loop to prevent damage through stretching.

**If you are not sure ...** Contract your service agent or local dealer for advice.

# SERVICING

## How to replace the crossfader

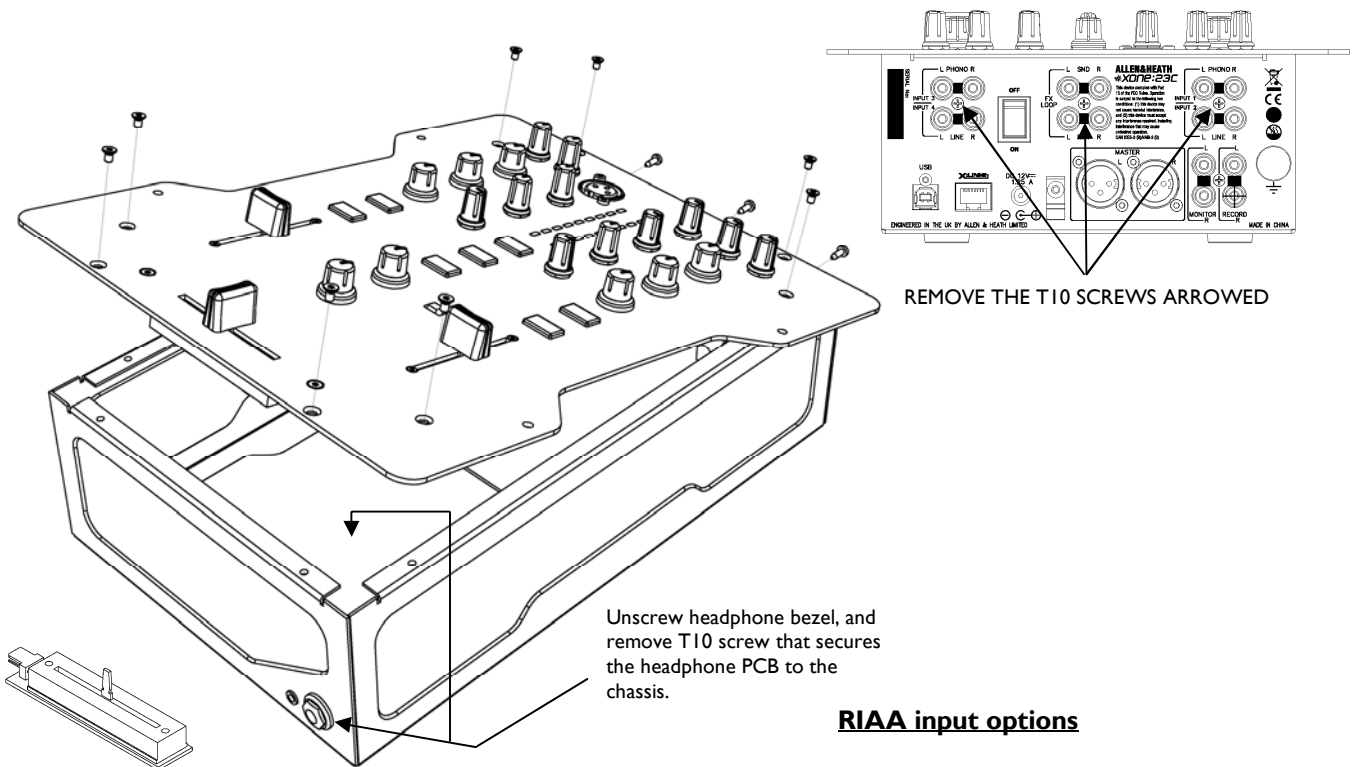
If the crossfader is subject to a lot of use it will, in time wear out and need replacing. Intermittent or noisy operation is an indication that it is becoming worn. Using a propriety fader cleaner such as CaigLube might temporarily restore use, but DO NOT use on a new fader as it will wash away the factory applied grease.

Warning! Dismantling your mixer could invalidate the warranty; if you are unsure of your ability to safely carry out this work then it is advised that you leave it to a qualified service technician.

Tools you will need are T10, and T8 Torx screwdrivers. Ensure that the power supply has been turned off and disconnected from the unit. Using the T10 torxdriver remove the three screws located in the centre of the channel input and FX loop connectors (see illustration), then using the T8 torxdriver remove the 8 screws that hold the front panel to the chassis. Now carefully lift the front edge of the panel up until the PCBs clear the chassis and pull the whole assembly forward slightly until the connectors at the rear are free from the chassis. You can now lift the front panel up to gain sufficient access to replace the crossfader.

If you wish to completely remove the front panel assembly you will need to unscrew the 1/4" headphone bezel using an 11mm or 7/16 AF socket, and remove the T10 screw that secures the headphone PCB to the chassis. Carefully unplug the multi-way harness from the connector PCB and lift the front panel away from the chassis.

Reassembly is a reverse of this procedure. Take great care to ensure that no harnesses become trapped and that all connectors are fully pushed home. Replace the screws and test the mixer for correct operation.



## RIAA input options

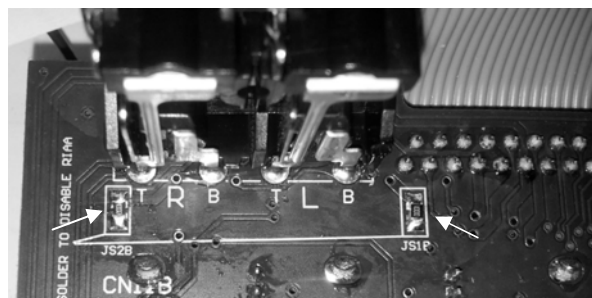
### To Replace the crossfader

Using the T8 driver, remove the 2 screws either side of the crossfader and lower the crossfader mounting plate - unplug the 4way harness from the crossfader PCB, and unscrew the fader from the mounting plate

The mounting plate is designed to allow for fitment of the contactless Innofader and can be fitted in two different positions depending which fader is being fitted.

The standard fader can be ordered under A&H part number 004-503JIT

The Innofader can be ordered under part number 004-504JIT



If the RIAA input level is too low, or you wish to convert them to Line level. To increase the gain by 6dB, remove the resistors arrowed and link the Pads with solder. These resistors are located on the underside of the front panel PCB, directly behind the Input RCA connectors

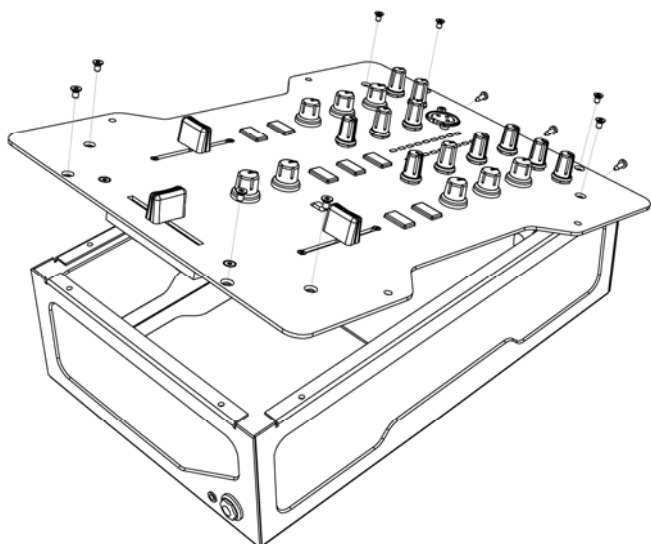
To convert to Line level, remove the resistors and leave the Pads unsoldered.

## Reconfiguring the soundcard for use with DVS

The default routing for the soundcard sends (to the computer) is for USB channel 1-2 = record output and USB 3-4 = FX send. This configuration allows you to record your set and add FX (see hints and tips on page 21).

The supplied software, MixVibes Cross LE, can also be used with time-coded vinyl and to use this option the mixer soundcard routing will need to be internally reconfigured.

**This job should be entrusted to an authorised service agent whilst the mixer is still under warranty as any damage due to incorrect procedure will not be covered.**



To reconfigure the mixer to work with DVS software you need to route the audio signals from the turntable pre-amplifiers directly to the soundcard using the short three-way harnesses supplied with the mixer.

Referring to page 18, undo the screws securing the top panel to the chassis and carefully lift up the panel to gain access.

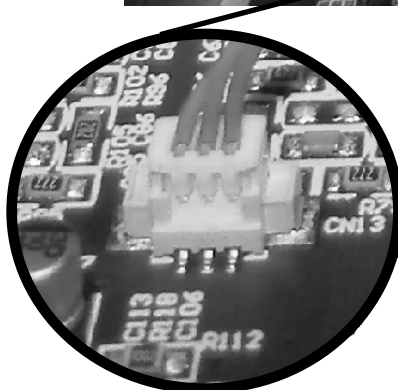
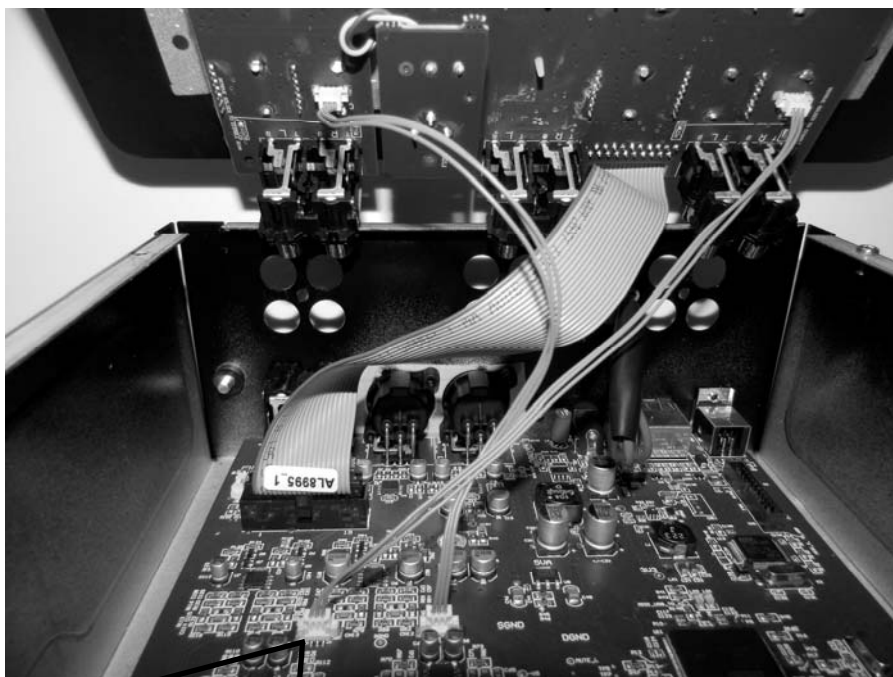
The three-way harnesses plug into sockets located underneath the top PCB, and are then plugged into sockets located on the soundcard PCB, as shown in the picture below.

The harness from the left side of the top PCB plugs into the right hand side socket on the soundcard PCB.

The sockets are keyed and will only plug in one way, and will click into place securely.

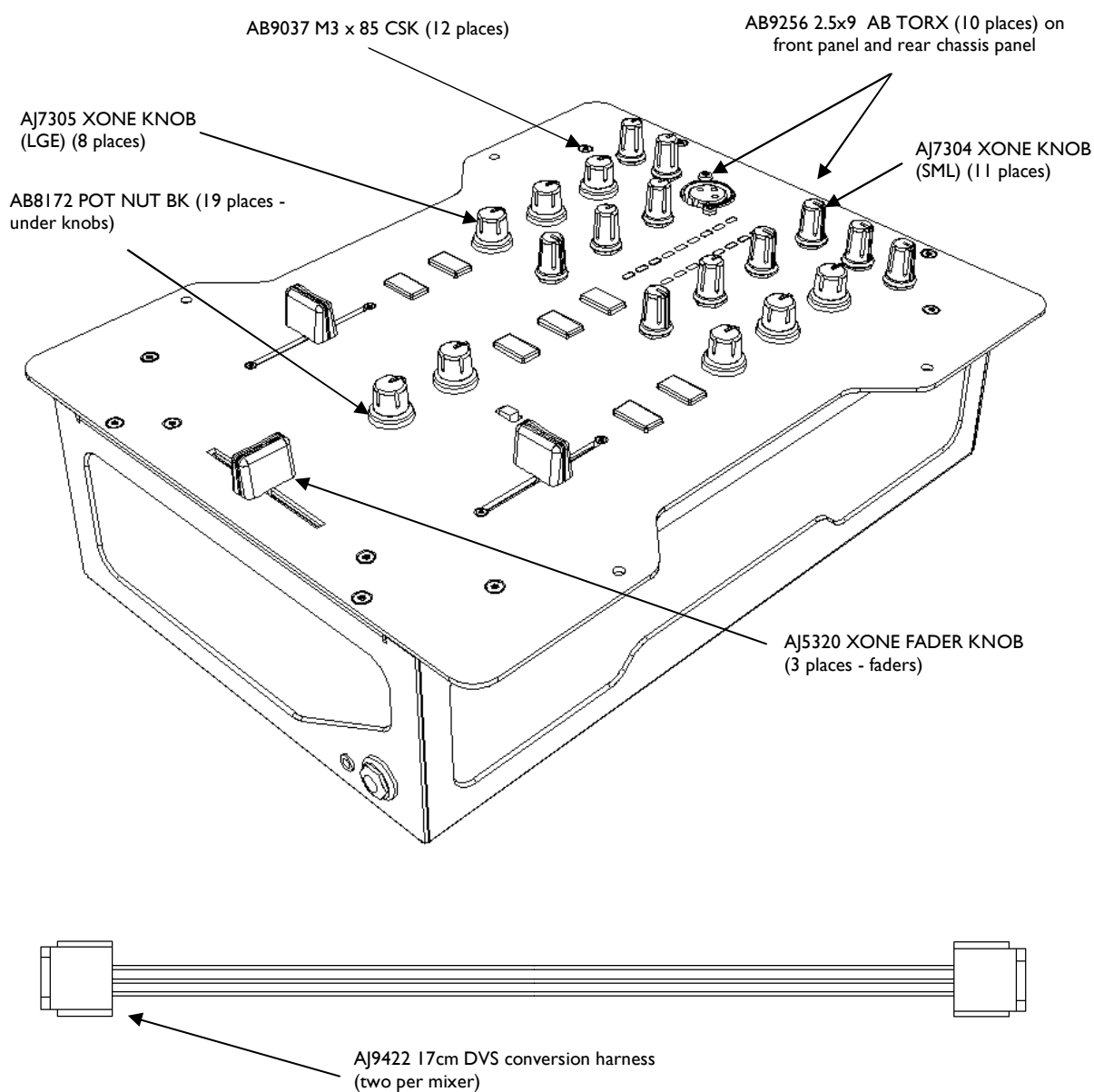
Ensure that the harnesses will not get trapped between the chassis and top panel, and carefully reassemble the mixer.

Refer to the MixVibes documentation on how to configure the software to use encoded vinyl.



**The sockets are keyed and will only plug in one way - ensure they are correctly orientated before pushing them home!**

## USER-REPLACEABLE PARTS



The diagram above shows all of the replacement parts that can be ordered from your local technical support, or direct from Allen & Heath, for the Xone:23C. When ordering please quote the part number(s) of the required parts - this makes life easier for us!

See page 18 for information on replacing the crossfader, and for replacement crossfader assembly numbers.

## TIPS and FAULT FINDING

### **Tips**

Using your computer for both track replay and FX

The default configuration for the internal soundcard on the Xone:23C allows for two stereo channels from the computer and two stereo channels back. The channels from the computer are primarily used to replay audio files, and channel 1-2 to the computer is used to record the main mix. Channels 3-4 to the computer are, by default, connected to the mixers FX send output.

To configure the computer and mixer for both track replay and FX you need to aggregate the mixer's soundcard with the built-in soundcard on the computer. On a Mac this is done in the Audio MIDI utility (see page 12) - on a PC you will need to download and install the utility ASIO4ALL ([www.asio4all.com](http://www.asio4all.com)).

Using a 3.5mm to RCA stereo jack lead, connect the headphone socket on the computer to the FX return on the mixer. Download and install the free demo of Ableton Live ([www.ableton.com](http://www.ableton.com)) - and configure it for FX send/return - input to Ableton from the mixer soundcard 3 - 4 and output to the computer's headphone.

You can now play tracks into the mixer from your chosen DAW and use the effects in Ableton via the mixers FX send/return.

### **No sound from mixer**

Check that the unit is powered on, and that an audio signal is connected to a channel input.

Check that the Input level controls are turned clockwise at least to the centre position and that the music sources connected are in the correct inputs (Inputs 1 - 3 for turntables, Inputs 2 - 4 for CD players).

Check that the EQ controls are in the centre position.

Turn On the Channel CUE switch and raise the input channel LEVEL control until you see the meters displaying the music signal.

Raise the channel fader, and ensure that the crossfader is towards the channel that is receiving the audio signal.

Turn up the MASTER, MONITOR or HEADPHONE level controls, depending on what output your amplifier is connected to, or if you are monitoring through headphones.

### **External effects unit can't be heard**

Check that the Effects unit is connected correctly (see page 5) and switched on - the SND on the rear panel of the mixer should be connected to the input socket on the external effects unit, and the output from the effects unit should be connected to the RTN.

Check that the EXT - ON switch is on (illuminated RED) and that the channel FILTER switch is ON (illuminated BLUE).

### **Signal is loud and distorted**

Check that you are using the correct input; i.e. don't plug a CD player into the PHONO input....

Adjust the channel input LEVEL so that the meters peak the +3 or +6 LEDs. If the red +10 meter LED comes on, turn down the channel LEVEL control.

# SPECIFICATIONS

## Connections

### Inputs

	<u>Connection</u>	<u>Impedance</u>	<u>Nominal Level</u>	<u>Maximum Level</u>
Phono	RCA	47K/330pF	7mV-100mV	
Line	RCA	20K ohm	-10 to +20dBu	
FX RTN	RCA	10K ohm	0 to +20dBu	
Mic	XLR	<2K ohm	-42 TO -12dBu	

### Outputs

Main Mix	Balanced XLR	100 ohms	+4dBu	+28dBu
Monitor	RCA	100 ohms	-2dBu	+22dBu
Record	RCA	100 ohms	-2dBu	+19dBu
FX SND	RCA	100 ohms	-2dBu	+19dBu
Headphones	3.5mm and 1/4" TRS Jacks	1 ohm		200mW RMS into 30 ohms

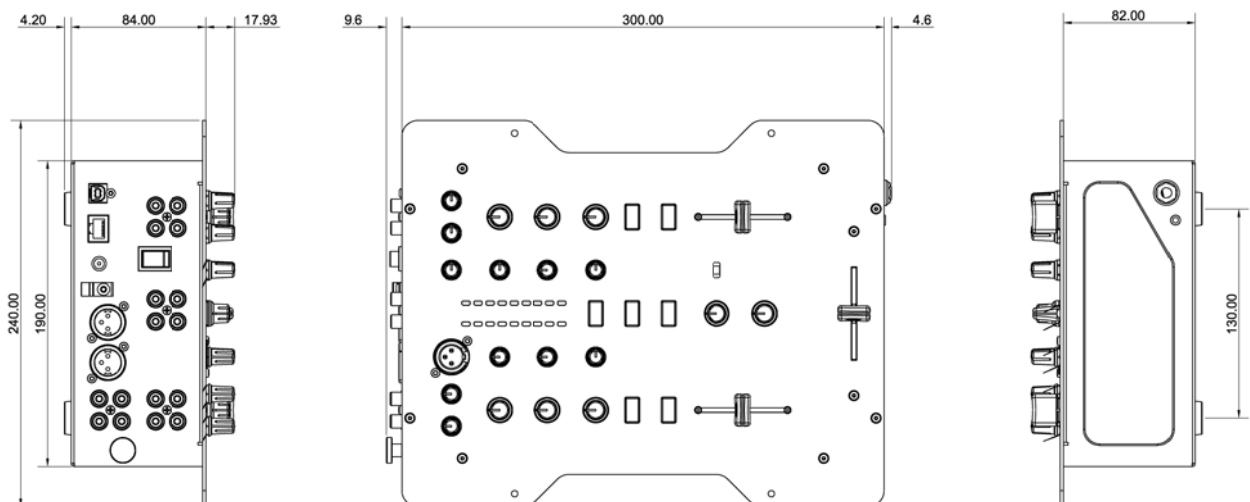
### Performance

Distortion	Main Mix out	+10dBu	0.01% THD+N
Noise 22-22Khz	Main Mix out	unity	-85dBu un-weighted
Fader shut off	Channel fader		>-80dB
Xfade shut off	Xfader		>-80dB
Frequency Response		10Hz to 50kHz	+/-0dB

### Dimensions

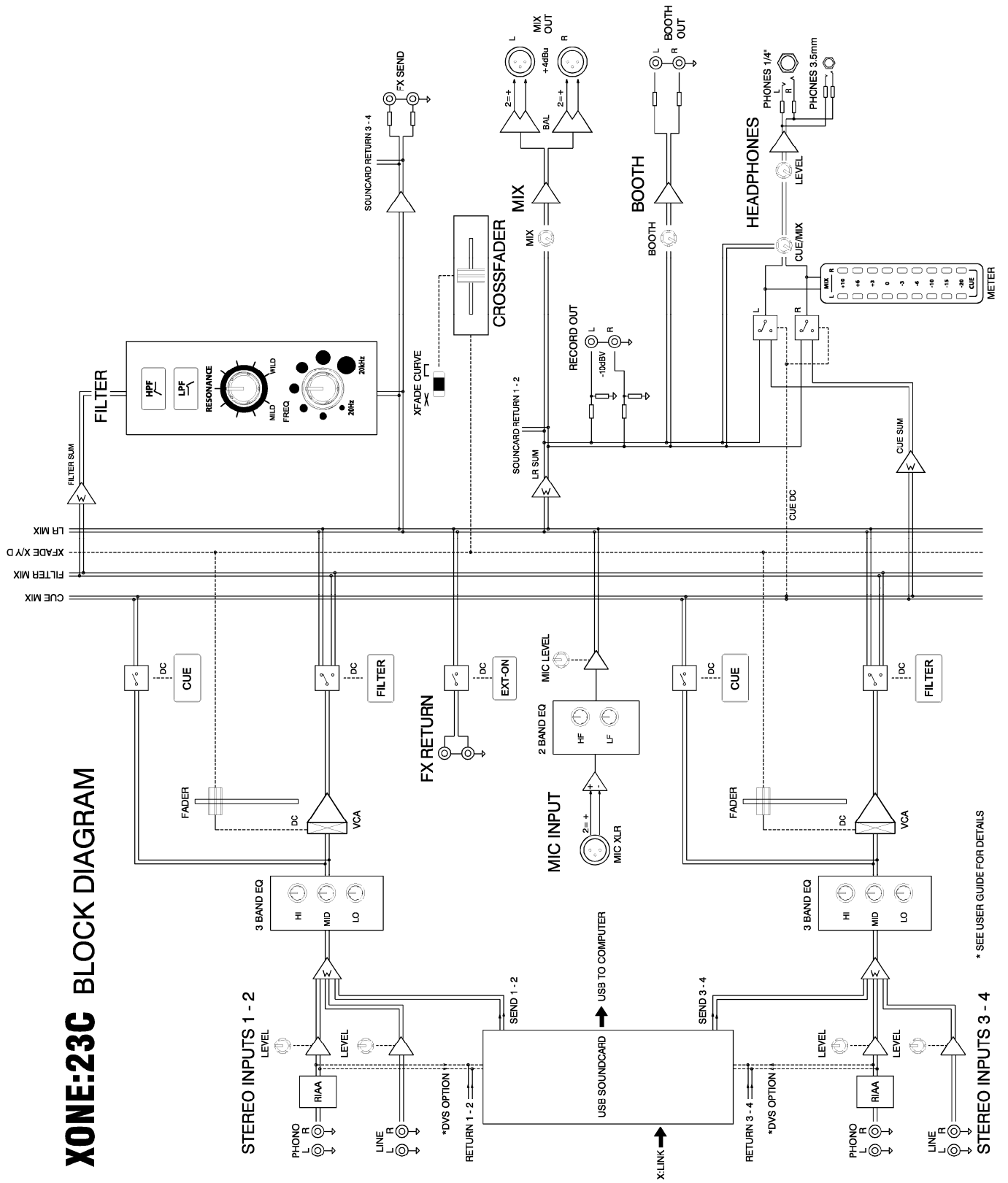
**Weight** 2.7kg (6lb)

**Weight Packed** 4kg (8.8lb)



# BLOCK DIAGRAM

## XONE:23C BLOCK DIAGRAM



\* SEE USER GUIDE FOR DETAILS

# PRODUCT REGISTRATION

## Registering your product

Please go to [www.allen-heath.com/register.asp](http://www.allen-heath.com/register.asp) and register your product's serial number and your details. By registering with us and becoming an official Registered User, you will ensure that any warranty claim you might make is actioned quickly and with the minimum delay.

Alternatively, you may either copy or cut off this section of the page, fill in the details, and return it by mail to:

Allen & Heath Ltd, Kernick Industrial Estate, Penryn, Cornwall TR10 9LU, UK



### ALLEN&HEATH PRODUCT REGISTRATION

Thankyou for buying an Allen & Heath product. We hope that you're happy with it and that you enjoy many years of faithful service with it.

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Town/City: \_\_\_\_\_

County/State: \_\_\_\_\_

Country: \_\_\_\_\_

Postcode/Zip: \_\_\_\_\_

Telephone: \_\_\_\_\_

Email: \_\_\_\_\_

Why did you choose this console? \_\_\_\_\_

Which other products did you consider before choosing A&H? \_\_\_\_\_

Is there any thing you would like to improve on this mixer? \_\_\_\_\_

What audio magazines do you read? \_\_\_\_\_

If you were going to design a mixer for your work, what are the 6 most important features it should have (in order of importance)

1

2

3

4

5

6

We may use the information you provide to inform you of future product developments. We will not give or sell this data to third parties. Please indicate with an 'x' if you do not wish to receive any further communications from us. ☐







