ACTIVE

Qmotion

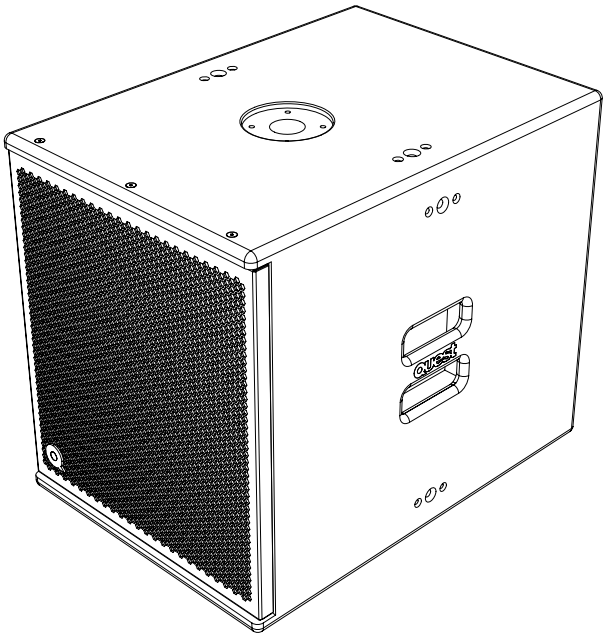
Quest engineering

User Manual

MODEL: QM 1000AS

Qmotion

Contents



Warnings

QM-1000 manual

Warning, constant exposure to high ambient sound pressure levels will cause hearing damage.

Exposure to extremely high noise levels over long periods of time will cause permanent hearing loss.

Many countries have Government occupational safety authorities and the following noise table is a commonly agreed standard of permissible noise level exposures a worker can be subjected to without suffering great hearing loss.

Duration Per Day (Hrs)	Sound Level dB (A weighted scale)
8	90
6	92
4	95
3	97
2	100
1 ½	102
1	105
½	110
¼ or less	115

Any exposure in excess of the above permissible limits could result in some hearing loss.

You will notice a rapid increase in hearing damage above 103dB. Apart from the sound pressure level of the sound system, you have the added effect of people yelling into your ear to he heard over the volume of the sound system. Hearing damage can not be reversed so limit the time you are in loud environments or buy ear plugs.

Be protected by hearing protection such as ear plugs. In the case of audio mixing personnel, remove the plugs when you are mixing and replace them if you are between music sets. This will lower your exposure time to high SPL.

Safety precautions

Quest Engineering strongly advise unless you possess skill in the proper use of hand and power tools and have a thorough understanding of local building and fire codes, then the installation of this speaker should be carried out by suitably qualified personnel following locally authorised and approved safety standards. A familiarity with the area behind the wall or ceiling where you plan to install the speakers is extremely important. Improper installation can cause serious injury or death. If in doubt contact your Quest Engineering dealer or a professional installation technician.

Installation allowing direct precipitation is not advised and installation practise must prevent liquids from entering the speaker enclosure.

Do not place sources of heat on the speaker cabinet such as lighting equipment or smoke machines, and where possible please keep out of direct sunlight.

Attention

Before connecting or operating your new Quest Engineering speaker, please study the accompanying instruction manual paying particular attention to the operating precautions and wiring procedure.

Quest Engineering will not assume responsibility for incorrect installation or operation of this product.

Primary controls

Description

QM1000 Overview

The compact QM1000/108 Flexi-System is a combination sub bass and satellite speaker system powered with three internal amplifiers and controlled from a master input module built into the QM1000 sub bass box. It has a number of operational modes for a variety of live and installed sound applications.

Multiple inputs

This system is primarily a sub bass/satellite full range stereo system with the added advantage of two extra inputs. The amplifiers powering the satellite speakers can be accessed independently of the main signal stream. This means that a completely different signal stream such as fold-back mixes or a combination of fold-back and front of house mixes can be sent to the QM108 satellite speakers or substitute any other satellite speakers that the audio operator may wish to use.

Three Systems in one box

This flexibility means that the QM1000 bass module can be utilised as the bass reinforcement to any conventional powered full range speaker system and the satellite speakers can be used as fold-back monitors with 2 channels of independent fold-back mix. It is also possible to substitute any of the other Q-motion series multipurpose fold-back/front-of-house monitors for the QM-108 speakers to give the maximum in flexible audio. One show this can be a sub/satellite system and with the flick of a switch, it becomes a powerful sub bass + 2 fold-back channels system with the capability of connecting 4 x fold-back monitors.
(See QM10/12DC)

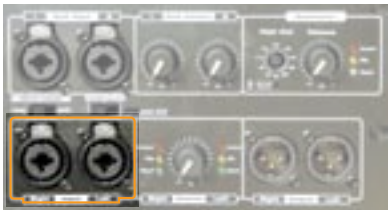
QM 108 Satellite speaker

The QM108 is a compact 2-way 8-ohm trapezoid full range speaker intended for use with the QM1000 Flexi-System package. It is also very good as a stand alone timber installation speaker for voice and music reproduction. The cast frame 8" mid bass and 20mm exit horn loaded HF driver are tuned for maximum vocal clarity and projection. The power handling capacity of the QM108 is well over 170 watts RMS and has internal protection plus the added limiter protection of the QM1000 amplifiers. The QM108 can be pole mounted on a 35mm speaker stand or wall mounted with a dedicated wall bracket.

Cable connections and system configuration

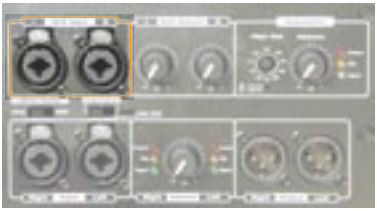
1. Stereo – Auxiliary mode switch

Input routing selection switch for stereo sub/satellite or independent multi channel operation.



2. Left and Right F/male XLR- Phono inputs.

Stereo line level signal inputs to sub bass and satellite amplifiers when Aux input switch set to stereo mode. In this mode master volume controls total system output.



3. Aux 1 & 2 XLR – Phono inputs

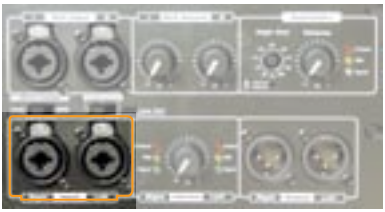
Independent auxiliary inputs to access satellite amplifiers when Aux input switch selected to Aux. Gain per Satellite channel can then controlled by the Aux 1 & 2 volume controls.

4. Auxiliary input crossover selector

This switch will select either full range signal or activate one of 2 filter settings at 80Hz or 120Hz to the 2 satellite amplifiers.

Basic 2 – way mode

1. L&R Line In



Connect signal leads from your mixer (master left/right, line out, to the balanced inputs using XLR mic lead or unbalanced phono connectors. XLR connectors to be wired as follows:1 ground, 2 +, 3 -. Unbalanced Phono leads pin1 ground and shorted to pin 3-, pin 2 tip. Balanced Phono leads can be wired Sleeve pin 1 ground, Ring pin 3-, and tip pin 2

2. L&R Line Through

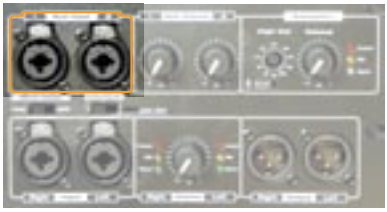
Use this Male XLR parallel output to route the incoming line signal to other line level inputs such as powered speakers or into Aux 1&2 inputs for alternative set-up configurations.

7. Sub Bass volume

Volume control for internal 650 watt Sub bass amplifier. When used in conjunction with the Master L&R input, a balance between the low frequencies of the sub bass and the mid high output from the satellite speakers can be optimised for the venue and the music source.

Independant Satellite mode

3. Aux 1&2 inputs

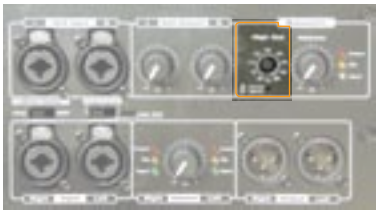


Input to Satellite amplifiers when in Aux mode.

4. L & R input volume control

When Aux is engaged L + R input volume controls drive Satellite amplifiers outputs from Aux inputs.

8. HF cut



This control can be used to change the bass crossover frequency from 80 Hz to 200 Hz. For best sub bass response select 80 – 100Hz.

Specifications

QM 1000A

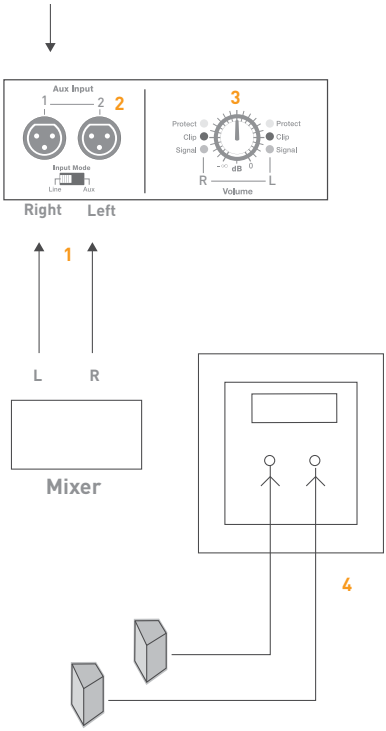
Frequency response+/- 3dB	44 Hz - 80-200Hz
Axial sensitivity 1W@lm	99dB
Maximum SPL @lm	129dB
Subwoofer amplifier	lx 660 W RMS / Class AB
Sat & Mid/High Unit amp	200 W RMS @ 8 ohms / Class AB
Connections	2x XLR in, 2x lack MIC IN 2xXLR OUT, 2x Speakon® Satellite outa
Subwoofer	lx 15"
Height	21.4in/545mm
Width	17.7in/450mm
Depth	25in/635mm
Weight	106. 71b/48.5kg

Common system configuration set ups

1. Stereo full range sub satellite mode

This is the most common configuration for a performer who is using the system as a stereo full range playback for live or pre recorded music.

In this configuration, the input volume control acts as a master volume for the whole system and the subwoofer control is post the input/ master.



1. Right and left input XLR/Phono. Connnect to mixer output
2. Line / Aux input selector. Select line to engage stereo Sub/Satellite mode.
3. Master Volume. Set master volume to OdB (max) for most mixer gain sensitivities.
4. Speaker outputs. Connect satelite speakers L + R.

Note:

High Cut for adjustment of the upper bass cross-over frequency for the Sub bass amplifier set to below 100 Hz for low bass, above 125 for a higher range of bass frequencies.

Subwoofer volume. To control sub bass volume level. By increasing input volume and adjusting subwoofer volume, a balance the satellite speakers and the sub bass cn be achieved

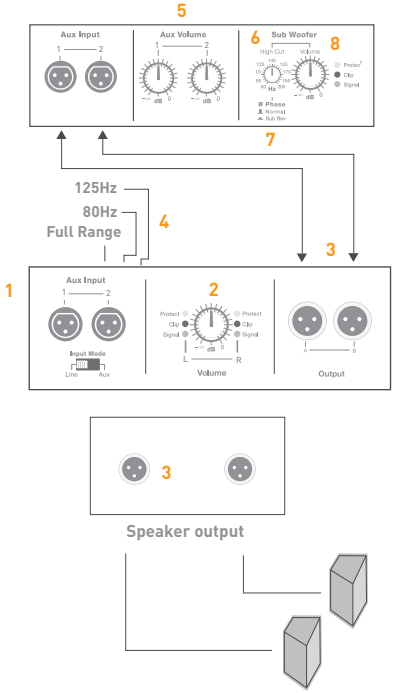
2. Sub + independent stereo mode with alternative passive speakers

This configuration allows the operator to connect alternative satellite speakers and reset the cross-over frequencies from full range to 80 Hz or 120 Hz depending on the type of satellite speaker the operator wishes to use. Completely independent volume control of the satellite speakers is also possible in this mode

The input mode switch

This switch configures the QM 1000 mid/high unit for use through the Aux1 & 2 Volume controls. Select full-range mode for 12" speakers, 80 Hz for 10" and 8" speakers or select a higher crossover frequency for lower powered satellite speaker boxes under 150 watts RMS.

The Aux volume controls will now function independently from the master volume control.



1. Set Input mode switch to AUX.
2. Select volume to max.
3. Connect right and left XLR outputs to AUX input 1 and 2 with XLR patch leads.
4. Select the low cut filter AUX 1 and 2 to full range/80Hz/125Hz depending on your choice of satellite speakers. 8" speakers function best with the high pass filter set to 80 or 125Hz. 10" speakers should be set to 125Hz. 12" speakers can be set to 80Hz or full range.
5. Aux 1 and 2 volume now controls the output level of each auxillery amplifier.
6. High cut ajusts the cross-over frequency of the sub bass set below 100Hz for low bass seperation from satellite speakers.
7. Normal Sub Rev Sub bass phase/polarity reversal switch. Some brands of speaker boxes are wired reverse polarity to the standard. When using speakers of a different brand to Quest Engineering you may operate this switch to see which setting sounds best with your speakers. If not sure, leave "in phase"
8. Sub woofer volume. To ajust volume level of sub bass, operate the control knob.
9. Speaker outputs. Connect speakers. Do not allow speaker output left and right to be connected together when connecting multiple speakers.

Installation and wiring options

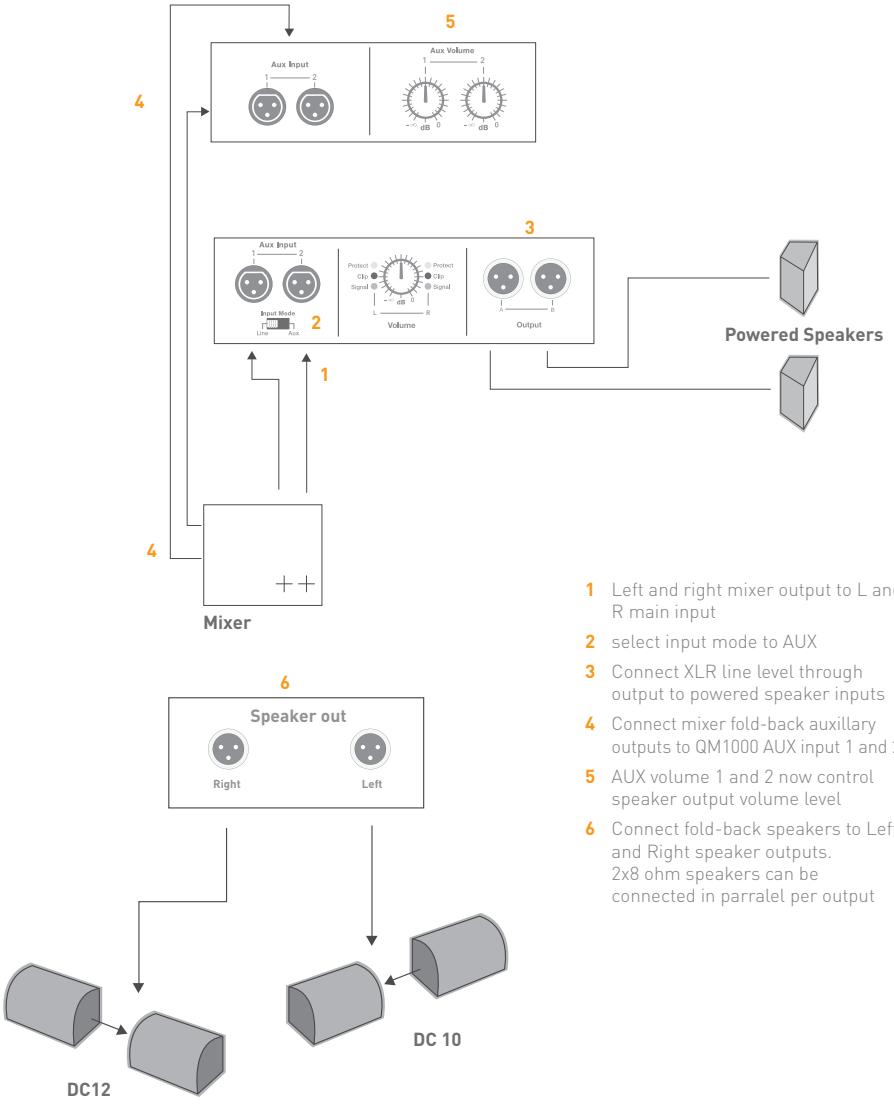
Sub bass + powered speaker front-of-house + 2 channels fold-back

When the operator wishes to use powered full range speakers, this configuration allows the QM 1000 to provide sub bass enhancement while also allowing 2 channels of separate fold-back. Two fold-back monitor speakers per channel can be connected.

Select the input mode switch to Aux

This switch configures the QM 1000 mid/high unit for use through the Aux1 & 2 Volume controls as independent fold-back amplifiers. Select full-range mode. Fold-back speakers placed on the floor will have a natural increase in bass response. For clean vocal reproduction, it may be necessary to select the 80Hz or 120 Hz crossover to "clean up" the vocal frequency response.

The Aux volume controls will now function independently from the master volume control.



1 Left and right mixer output to L and R main input

2 select input mode to AUX

3 Connect XLR line level through output to powered speaker inputs

4 Connect mixer fold-back auxillary outputs to QM1000 AUX input 1 and 2

5 AUX volume 1 and 2 now control speaker output volume level

6 Connect fold-back speakers to Left and Right speaker outputs. 2x8 ohm speakers can be connected in parralel per output

Mono satellite speakers + 1 channels fold-back

Two 200 watt (8 ohm) satellite amplifiers in the QM 1000 makes it possible to connect the two front of house speakers to one speaker output channel and the second output channel can be used as a single channel monitor system.

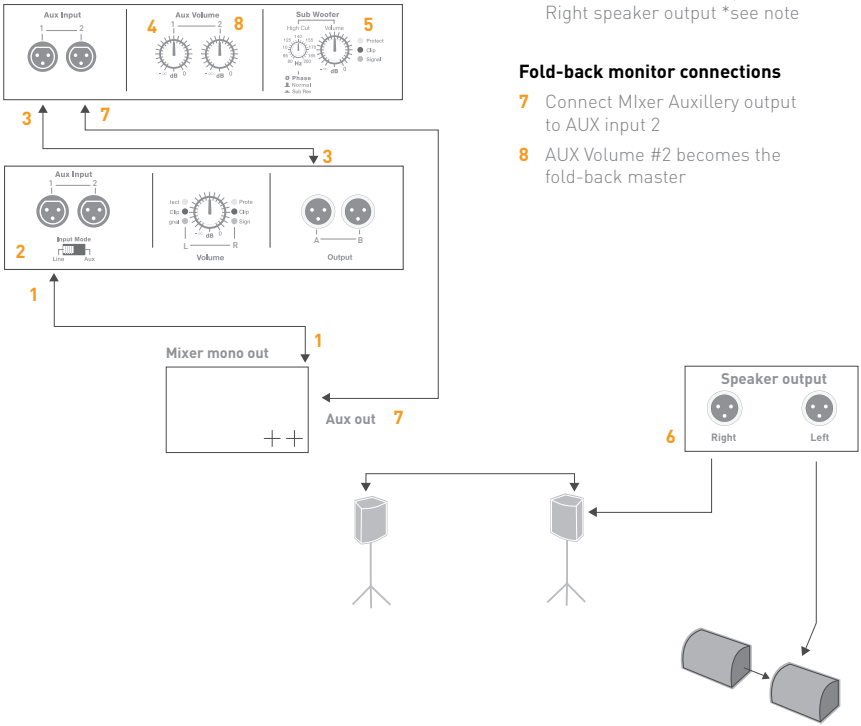
Front of house connections

1. Connect mixer output to Right input
2. Switch input mode to AUX
3. connect Right XLR line level output to AUX 1 input.

   Set low cut filter to 80Hz
4. Aux volume #1 becomes FOH satellite master volume
5. Adjust sub woofer volume to set sub woofer output
6. Connect FOH satelite speakers to Right speaker output *see note

Fold-back monitor connections

7. Connect MIxer Auxillery output to AUX input 2
8. AUX Volume #2 becomes the fold-back master



Related products and accessories

Additional speakers to suit QM 1000A

QM 108

QM 10DC

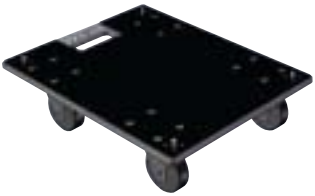
QM 12DC

Accessories

QM15-DWB Dolly Wheel Board

QM WSB Mounting Bracket

QM15 Transit Cover



Trade secrets

Quest Engineering instant sound guy course

How to avoid distortion in your system

Whether you are starting with one microphone two turntables and an iPod, or a 48 channels of live band, the audio principles are the same. If you introduce distortion to any part of the audio chain, it will still be there at the end of the line (your speakers).

A small audio system may only be a sound source, a mixer and a amplifier/speaker combination. A slightly bigger one may have added to the chain, DI boxes, digital effects, compressors, equalizers and electronic cross-overs. Any of these units that have excessive input level will pass on distortion to all the following equipment in the chain.

It follows that all the individual units must have their input and output levels operating within their designed operational range. A mixer output meter that is showing + 9 dB at the end of the "red bars", only to be pushing a compressor/limiter to limit 10dB is only going to sound bad, not get louder.

When you look at a Vu meter on a mixer (Vu means voltage units), you will see a row of numbers with a minus (-) sigh in front of them leading to a "0dB" on the right hand side. The "0" means you have hit full power. After that, you are heading into distortion country. How much distortion will depend on a number of factors but it is enough to say that by the time you get to the end of the red, your mixer is now a distortion box and sooner or later you are going to "fry" something.

What is Line Level?

For the purposes of live sound, line level is a signal standard made up by a group of engineers many years ago to set a common agreement of how much voltage a preamplifier should output, in order to drive a power amplifier to full power without going into distortion itself. The standard varies a little between countries but it is generally agreed that for our purposes, 0.775 volts of preamp signal will drive an amplifier to full power. In some countries, this standard is 1 volt. Let's say, 0.775 volts is "0" dB on your Vu (voltage units) meter. Every dB you send that pointer or red bar over 0dB you are testing the headroom of the system.

Calibrating your system for maximum power output.

It follows that your mixer and amplifier may have different standards of what we call "0dB" (remember the 0.775 and 1volt variation between some countries). One test you can do is to set up and turn on your audio system and after you have sound, unplug your speakers and play some music. Turn up the mixer until your amplifiers start to "clip" a little with regular flashes of the clip lights with the beat. So long as the clip lights don't stay on for more than a flash, you have reached the practical limits of your system as far as output power is concerned. Take note where this setting is on your mixer. Now you know how much "headroom" your system has. Also check any other equipment that may be in the line such as EQ units to make sure they are not deep in the "red". Now adjust your input and output levels so that your mixer is not at the end of the red bars or the pointer on the Vu meter is not hard over into the red.

Now turn down the system and plug the speakers back in. This method of calibrating the system is not totally accurate but it is a good start. If your find system is not loud enough after this test, go and get more speakers and amplifiers.
A distorting sound system may sound louder, but it won't live long.

How not to turn a mixer into a distortion generator.

To avoid overloading the pre amp inputs, always operate the master volume at a high level and control the volume from the input volume. The ideal situation is to have all the components of the audio chain operating at the same operational range. Do not run the system with the mixer "peaking in the red" while the box is turned down.

Also do not operate the system with the input peaking (red overload light on or flashing) and the master volume turned down.

Red lights flashing on a mixer indicate distortion. If you have a mixer with the facility to show you the input level on a meter, for example then you push a CUE/PFL button, set the input level to below the level of the red end of the LED ramp. If you run the row of red lights to the end of the ramp you will cause distortion at the very start of the pre amplifier stage of the mixer. At this point it will sound dirty and "fizzy" regardless of how good the rest of your sound system is. The rest of the system will be reproducing a distorted sound. If you need more volume, turn down the input signal so it is out of the red and turn up the output of the mixer.

Buzzes and noises in the sound system.

Getting rid of unwanted noises is a study in itself. Most of the noise, (apart from undesir¬able program) will fall into three categories.

(A) White noise. This is the hiss that suggests that the gain structure is set incorrectly. Something in the signal chain is boosting too much or an input is set too sensitive. If your equipment has gain switches on it, set them all the same. If the switch is labelled +4dB, set them all to that figure. If one piece of equipment seems to be overloading, set them all to -10/-20dB and be prepared to boost the input level of the QSA input. The last unit in the chain should be set to +4 dB at the output stage if possible when connected to a line level input.

(B) Low frequency hum. This is often caused by noise from the power leads being picked up by the audio signal cables. The preferred solution is to connect up your system with "balanced" XLR microphone cables. Especially if you are running the cables a long distance, (more than 5m /15 Ft). The other solution is to make sure that your audio cables are as far from power cables as possible.

(C) Buzz. Sometimes you can experience a hum and buzz together. A buzz is almost always a problem with the "earthing" of the system. It will often occur when you have the system powered from separate power outlets in the same building or audio and lighting sharing a common power circuit. Even when the audio and lighting systems are powered from separate sources, there can still be a common earth between them. For example, a smoke machine may be powered from the lighting system, yet the trigger mechanism could be connected to the audio system through the audio multi-core/snake. An earth connection between the audio and lighting will now exist and a buzz could be amplified in the audio system. The simple solution is to power your audio circuit and everything connected to it from the same source. If the buzz persists, check your signal cables, one may have an earth/shield disconnected.

A cheap but possibly life saving investment is a domestic power tester to check that the power supply sockets are correctly wired. Faulty or incorrectly wired power is a booby trap that is more common than you think.

It is wise to avoid switching on or off devices in the signal path while the speaker system is powered and turned up. Otherwise loud clicks and bangs could result. When shutting down the system, always turn the speakers off first. This is to prevent the speaker amplifying the sound of the other equipment in the chain being shut down. The reverse is true when powering up. Mixers and effects on first, power amplifiers or powered speakers on last.

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- CONFIRM YOUR WARRANTY
- REGISTER YOUR PRODUCT
- PROTECT YOUR NEW PRODUCT

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