



BEATRICE D16

16 Channel Network Audio Intercom

PRODUCT DETAILS





GlenSound Electronics Ltd

Thank you for choosing a new GlenSound product.

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Information contained in this manual is subject to change without notice, if in doubt please contact us for the latest product information.

If you need any help with the product then we can be contacted at:

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Sales enquires: sales@glenSound.co.uk

PRODUCT WARRANTY:

All equipment is fully tested before dispatch and carefully designed to provide you with trouble free use for many years.

We have a policy of supporting products for as long as possible and guarantee to be able to support your product for a minimum of 10 years.

For a period of one year after the goods have been despatched the Company will guarantee the goods against any defect developing after proper use providing such defects arise solely from faulty materials or workmanship and that the Customer shall return the goods to the Company's works or their local dealer.

All non-wear parts are guaranteed for 2 years after despatch and any defect developing after proper use from faulty materials or workmanship will be repaired under this warranty providing the Customer returns the goods to the Company's works or their local dealer.



SAFETY WARNING



This product can produce high sound levels via the headphone output.

Please take caution when operating this product as listening to excessively high peak or sustained levels of volume may permanently damage human hearing.



EU DECLARATION OF CONFORMITY FOR:

GS-BEATRICE D16

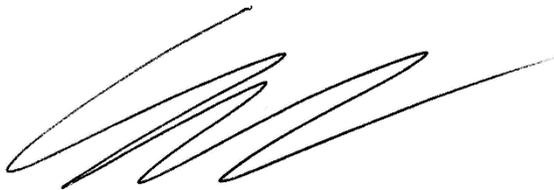
8 Channel Dante/ AES67 desktop intercom

This declaration of conformity is issued under the sole responsibility of the manufacturer.

This equipment is manufactured by Glensound Electronics Ltd of Brooks Place Maidstone Kent ME14 1HE is  marked and conforms to the following Union harmonisation legislation:

Low Voltage Directive:	EN60065 and EN62368-1:2014
Emissions:	BS EN55032:2015
Immunity:	BS EN55035:2017

Signed for and on behalf of Glensound Electronics Ltd.



Gavin Davis, Managing Director
Maidstone, Kent, England

Date: 15/08/2019

RoHS DIRECTIVE

RoHS 2 Directive 2011/65/EU restricts the use of the hazardous substances listed below in electrical and electronic equipment.

This product conforms to the above directive and for this purposes, the maximum concentration values of the restricted substances by weight in homogenous materials are:

Lead	0.1%
Mercury	0.1%
Hexavalent Chromium	0.1%
Polybrominated Biphenyls	0.1%
Polybrominated Diphenyl Ethers	0.1%
Cadmium	0.01%

WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT REGULATIONS 2006 (WEEE)

Glen sound Electronics Ltd is registered for business to business sales of WEEE in the UK our registration number is:

WEE/JJ0074UR

GLENSOUND BEATRICE D16

Handbook Contents

Issue 1

Description

Page No.

Contents

PRODUCT WARRANTY:	4
OVERVIEW	9
D16 FRONT PANEL LAYOUT.....	10
D16 REAR PANEL LAYOUT	14
MICROPHONE PHANTOM POWER.....	16
LOUDSPEAKER DIM LEVEL	18
SIDETONE	20
AUDIO BLOCK DIAGRAMS (analogue representation of digital circuits).....	21
Audio Circuits TO Dante/ AES67 Network <i>SEE ALSO FIXED MIXER</i>	21
FIXED MIXER.....	23
IFB/ AUX INPUTS.....	25
CONNECTING THE BEATRICE UNITS TO A DANTE NETWORK	26
Getting Dante Controller	26
Connecting Beatrice D16 To the Network.....	26
Audio Over IP Network.....	26
Running Dante Controller.....	27
Dante Controller TIP	27
Device Not Showing Up In Dante Controller	28
AES67 MODE.....	29
UPDATING THE BROOKLYN MODULE.....	32
WIRING INFORMATION	33
XLR & JACK Wiring	33

OVERVIEW

The BEATRICE range of IP intercoms was designed for broadcast, theatre and professional audio applications.

Our Beatrice intercom system utilises the reliable and proven Dante® network audio transmission protocol to allow real time distribution of uncompressed audio across standard networks. As such the BEATRICE 16 channel units are also fully compatible with other manufacturers' equipment using the Dante® protocol. The Beatrice D16 is also AES67 compliant.

All units in the system are designed to be very easy to use for the operator and simple to setup for the technician. They includes all the basic functionality required for small intercom systems and none of the overly complex installation requirements normally associated with large systems.

The Beatrice D16 provides 16 intercom circuits on and off the AoIP network. Four AoIP IFB circuits are provided to allow versatility of system setup.

A front panel built in microphone and loudspeaker are provided, or alternatively, an external microphone (Gooseneck or headset) can be connected to the front panel XLR and headphones or external loudspeakers can also be used.

The name Beatrice was chosen for our intercom range as she was the love of Dante Alighieri:

'Dante had fallen in love with another, Beatrice Portinari (known as Bice), whom he first met when he was only nine.' Source Wikipedia.

D16 FRONT PANEL LAYOUT



1. Loudspeaker

A front panel mounted loudspeaker for monitoring the incoming audio circuits. Note the loudspeaker is automatically turned off when a headphone jack is inserted into the headphone socket.

2. Level LEDs

The level LEDs provide a number of functions;

- A) When the unit is first turned on The 2nd LED from the left will flash. This is a heartbeat signal indicating that internal processor is starting up. When it's started and ready the 2nd LED will stop flashing.
- B) The first LED from the left flashes if no network connection is present.

- C) When adjusting the input or output gain of one of the 16 channels then the LEDs are used to indicate the position of the volume control. With just 1 LED on indicating a very low gain and all LEDs on indicating a very high gain. While in this mode the LEDs will be flashing to indicate that they are showing the gain position and not actual level.
- D) In all other circumstances the meter acts as a PPM to show the level being sent to the network from the selected microphone.

3. **Gain Adjust**

This shaft encoder can be continuously rotated left and right and it also has a built in switch which is operated by pushing it.

It is used in conjunction with the I/P GAIN or O/P GAIN illuminated buttons to adjust the input/ output gain of the associated channel.

To adjust a channels input or output gain, simultaneously press and hold the input (or output) gain button and also the talkback channel whose gain you want to alter.

The level LEDs will then flash to indicate that you are adjusting a gain. Use the rotary gain control to set the desired audio level and then press the gain control to apply the setting and exit the gain setup.

4. **Cut LS**

This toggle switch turns the loudspeaker on/ off. It does not affect the audio to the headphones. When in CUT LS mode the internal loudspeaker will not operate and when in ENABLE LS mode the internal loudspeaker will work.

This control does not affect the Dante network LS output.

5. **Headphone Jack**

This standard 6.35mm (1/4") stereo headphone socket accepts headphones from 30 to 1000 Ohms.

6. **External Microphone Input**

This is a balanced microphone input. It can accept dynamic and condenser microphones and phantom power (12v) can be turned on/ off via an internal link.

7. **Panel Microphone**

The panel microphone is a small electret microphone fitted behind the rugged housing and is suitable for most communications purposes.

8. **Mic Select**

This toggle switch selects which of the 2 microphones is to be used as the audio source. If the switch is in the up position then the panel mic is used and if the switch is in the down position the external microphone input is used.

9. **Mic Gain adjust**

These two rotary potentiometers adjust the gain of the two different microphone inputs.

10. **Speak to All**

Pressing this button enables the operator to turn on and talk to all 8 outputs simultaneously.

11. **Headphone / Speaker Volume**

This rotary knob adjusts the volume of the internal loudspeaker and front panel headphones.

12. **I/P Gain**

Use this switch in combination with a channels' talk key and the Gain Adjust encoder to alter a channels input gain/ level. (see 3. Gain Adjust for more info)

13. **Speak to Group**

The speak to group key is used to allow the operator to speak to a selection of outputs.

To make a group press and hold the Speak To Group key.

To alter the group press and hold the speak to group key and simultaneously press a channel's talk key. Each time you press the channel's talk key the channel will be added/ subtracted from the group.

14. **O/P Gain**

Use this switch in combination with a channels' talk key and the Gain Adjust encoder to alter a channels output gain/ level. (see 3. Gain Adjust for more info)

15. **Present**

There are 16 present indicators one for each talkback input from the audio network. These are a LED indicator.

When an incoming audio signal is detected on the associated incoming circuit the present LED will illuminate (threshold -20dB) to show that audio is being received on that channel. The present LED will stay illuminated for 10 seconds after the incoming audio stops.

16. **Speak**

The 16 front panel speak keys allow the operator to talk to the 16 outgoing talkback circuits. These talk keys operate as 'intelligent' lever keys whereby:

- A) A quick short press of the button will toggle the circuit on/ off
- B) A long holding press of the button will only turn the output on while the button is being pressed.

D16 REAR PANEL LAYOUT

17. IEC
Mains

18. Network
SFP Sockets

19. Network
RJ45s



17. IEC Mains

The standard IEC mains plug accepts external AC voltages of 100 -240 VAC +/- 10%. There is an internal fuse.

18. Network SFPs

There are 2 standard network data SFP sockets provided to allow redundant network connectivity if using Dante network audio protocol. They are both gigabit network connections. They accept standard SFP modules. The status LEDs flash to show when data is being correctly communicated with the attached switch.

If you require SFP modules then please email sales@glensound.co.uk for a quotation.

Network Note (Applies to both 17 & 18)

Factory default is to have the SFP & RJ45 sockets set to work in switched mode.

It is possible using Dante[®] controller to set these network interfaces to work as a redundant circuit instead of the switched mode.

19. **Network RJ45s**

There are 2 standard network data RJ45 sockets provided to allow redundant network connectivity if using Dante network audio protocol. They are both gigabit network connections. The status LEDs flash to show when data is being correctly communicated with the attached switch.

Either of the network sockets can be connected to a Power Over Ethernet (PoE) source to power the unit. This PoE source can be a mid-span source or a network switch with PoE. If a PoE source is present on both circuits then this will act as a redundant power supply.

MICROPHONE PHANTOM POWER

The factory default configuration of the D16 has the front panel microphone input set as +12v phantom power on. It is possible to deactivate or activate +12v phantom power by moving an internal jumper.

To turn the phantom power off or on the lid of the unit must be removed.

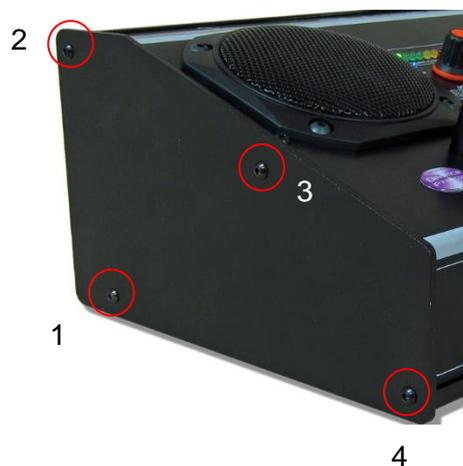
Equipment needed

1x M3 screwdriver

Please ensure that the unit is turned off before starting this procedure

Procedure

To disassemble the D16, remove screws 1,2,3 and 4 from the left-hand side panel of the unit, and then the equivalent screw 3 on the opposite right side panel of the unit.



Remove the left side panel.

The front panel can now be removed by sliding it towards the left of the unit, whilst prying it backwards and away from the top and bottom ridges.

Take care when removing the front panel as not to tear or damage the two ribbon cables that connect the front panel boards to the motherboard.

The front panel can be placed down resting forwards, so there is no need to disconnect any cables.

You may now access the jumper shown in the pictures below.

This printed circuit board is located on the lower section of the internal side of the front panel.



Jumper for Phantom power.

In the position as pictured phantom power is turned off. To turn on phantom power move the jumper so that it straddles the middle and rear (furthest most from front panel) pins.

After turning the phantom power on or off please replace the front panel and re-fit the side panel.

LOUDSPEAKER DIM LEVEL

The D16 has a loudspeaker dim circuit that automatically dims (reduces) the volume of the loudspeaker when any talkback key is operated.

During initial test at the factory the DIM amount will have been set to the factory default level. However there is an internal potentiometer available to adjust this level should this be required.

To adjust the DIM level the lid of the unit must be removed.

Please make sure the unit is turned off before starting this procedure

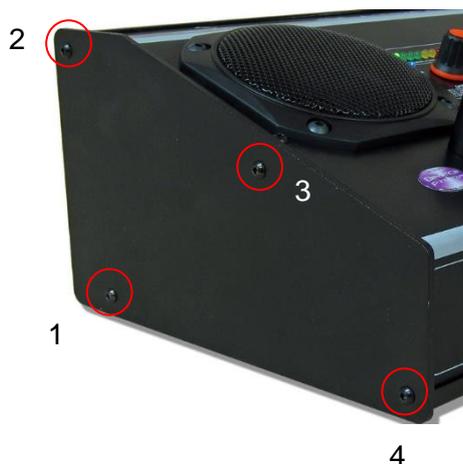
Equipment needed

1x M3 screwdriver

Please ensure that the unit is turned off before starting this procedure

Procedure

To disassemble the D16, remove screws 1,2,3 and 4 from the left-hand side panel of the unit, and then the equivalent screw 3 on the opposite right side panel of the unit.



Remove the left side panel.

The front panel can now be removed by sliding it towards the left of the unit, whilst prying it backwards and away from the top and bottom ridges.

Take care when removing the front panel as not to tear or damage the two ribbon cables that connect the front panel boards to the motherboard.

The front panel can be placed down resting forwards, so there is no need to disconnect any cables.

You may now access the Dim control shown in the diagram below.

The Dim control is located on the left hand side towards the front of the unit when viewed from above.

PCB VIEW OF INTERNAL OF D16 SHOWING DIM CONTROL

Internal Loudspeaker DIM control



When looking at the D16 from the front top view (as per the diagram above) turning the DIM potentiometer clockwise will decrease the amount of DIM being applied and turning the control counter-clockwise will increase the amount of DIM to the extent that if set fully counter-clockwise there will be no output level from the loudspeaker when a talkback key is operated.

After adjusting the DIM level please replace the lid and re-fix the side panel.

SIDETONE

Sidetone, the audio level of the operator's own voice in the headphone output.

Some operators like sidetone as it provides confidence that their voice is being transmitted, while other do not like it as it can be a distraction.

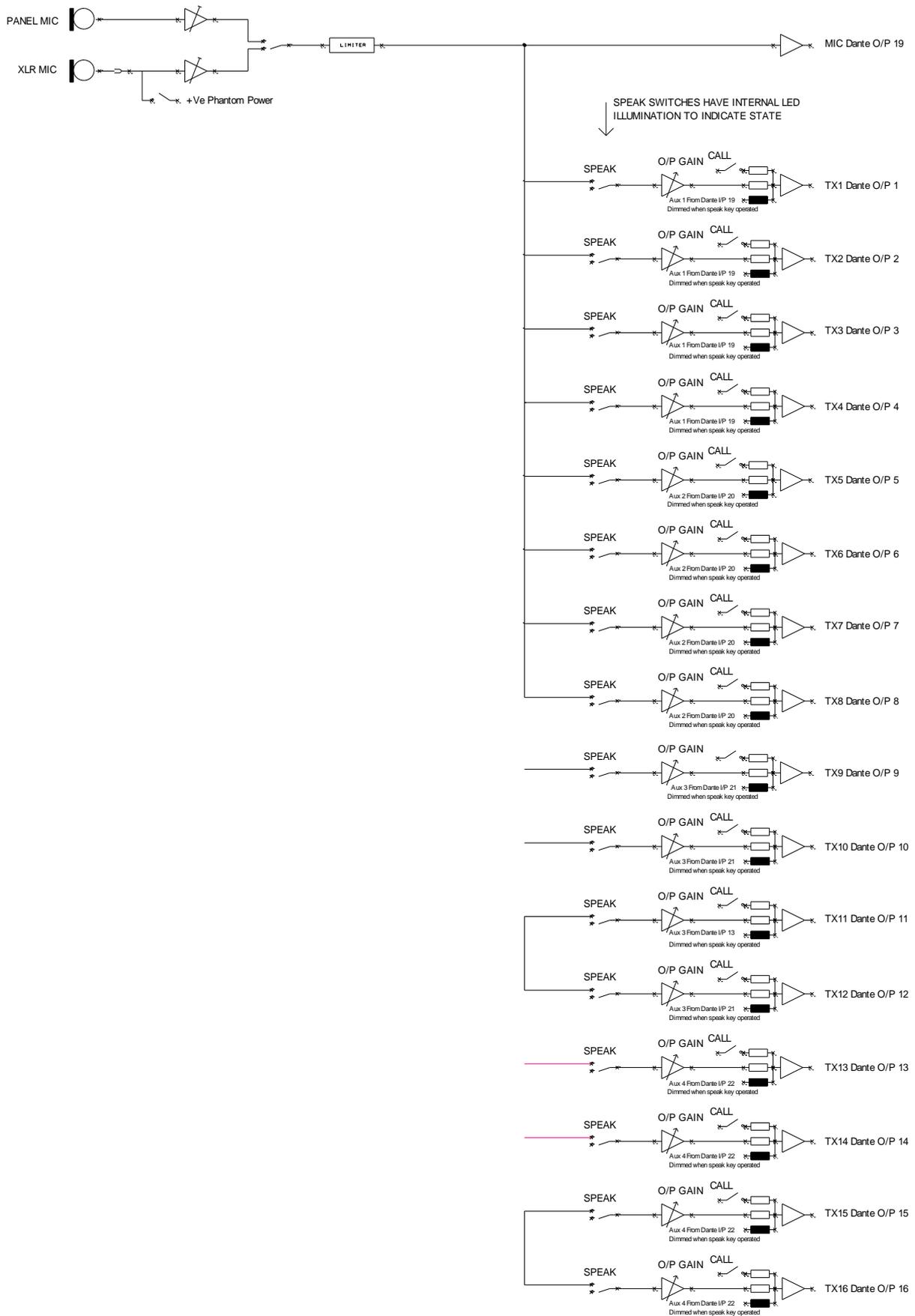
The sidetone level can be adjusted by the operator.

To adjust the sidetone level simultaneously press and hold the I/P Gain and O/P Gain buttons. Once both have been pressed the Level LEDs will flash to indicate that you are adjusting the sidetone level.

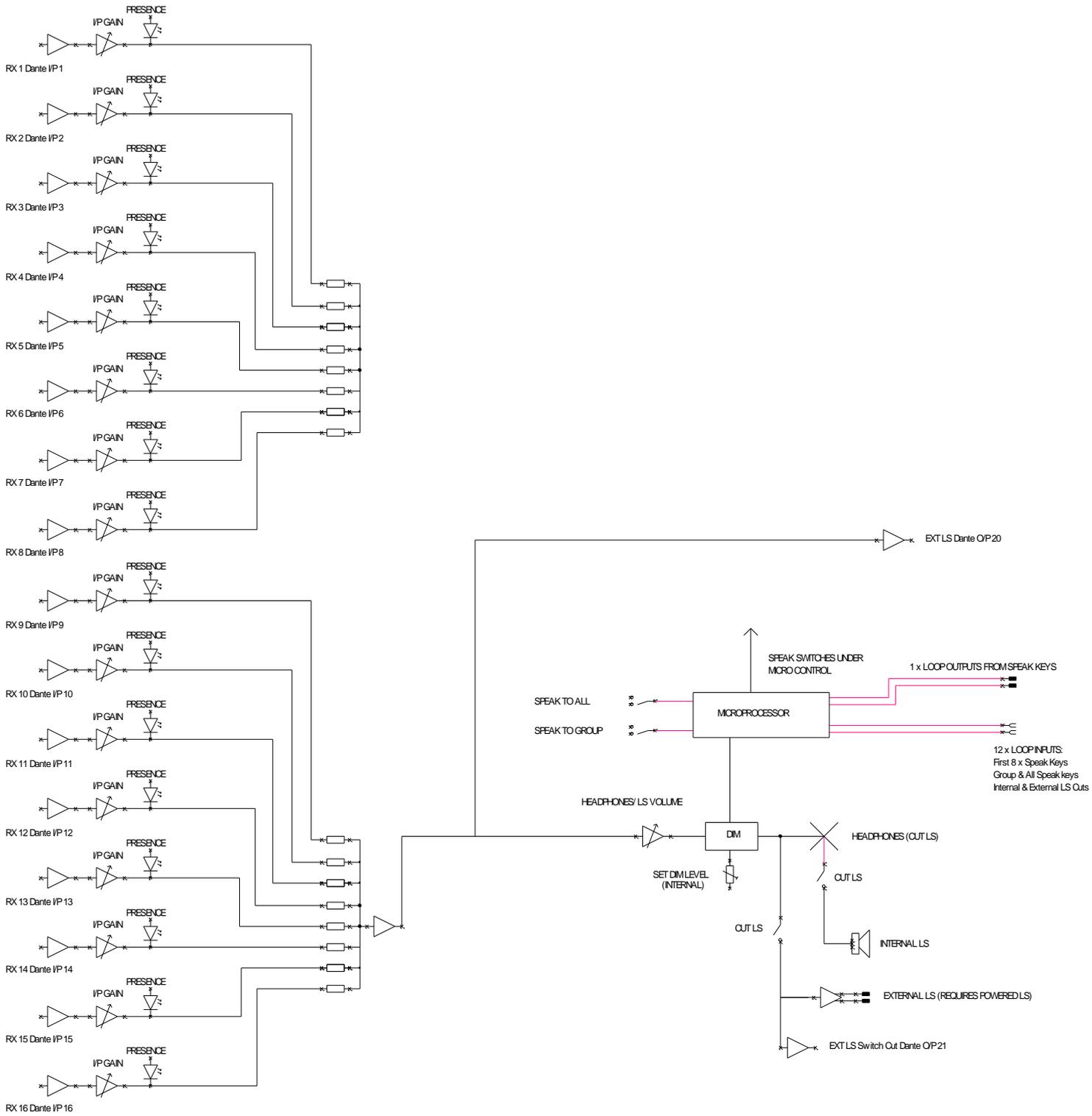
Rotate the Gain Adjust encoder for the desired level and then press the Gain Adjust encoder to set this level and leave the Sidetone setup.

AUDIO BLOCK DIAGRAMS (analogue representation of digital circuits)

Audio Circuits TO Dante/ AES67 Network SEE ALSO FIXED MIXER



Audio Circuits From Dante/ AES67 Network



FIXED MIXER

The Beatrice D16 includes multiple fixed ratio mixers with inputs & outputs directly on/ off the Dante/ AES67 network.

In a small simple intercom system there may be requirements for one user to listen to multiple sources on one single talkback channel. The internal fixed mixer within the Beatrice D16 is suitable for setting this up.

Groups are another possible requirement in small intercom systems whereby 2 or 3 operators (such as cameramen) are normally all on one single talkback circuit. The internal fixed mixer also helps with setting these circuits up.

The below table shows how these fixed ratio mixers are configured internally in the DSP. To use one or more of the internal mixers just route the audio to/ from the mixer channels in Dante[®] controller.

Note that the default name in Dante[®] Controller of the receivers are 'Mix In X' (whereby X is the channel number)

MIX OUTPUT		SUM OFF
<i>Dante Output Channel No:</i>	<i>Default Name in Dante Controller:</i>	<i>Dante Receiver Channel Nos:</i>
22	"Sum of 23 to 32"	23 to 32
23	"Sum of 23 to 27"	23 to 27
24	"Sum of 28 to 32"	28 to 32
25	"Sum of 23 to 25"	23 to 25
26	"Sum of 26 to 29"	26 to 29
27	"Sum of 30 to 32"	30 to 32
28	"Sum of 23 & 24"	23 and 24
29	"Sum of 25 & 26"	25 and 26
30	"Sum of 27 & 28"	27 and 28
31	"Sum of 29 & 30"	29 and 30
32	"Sum of 31 & 32"	31 and 32

IFB/ AUX INPUTS

There are four IFB (Interruptible Feed Back)/ AUX circuits within the Beatrice R16.

These are incoming audio circuits from the Dante[®]/ AES67 network that are mixed in with the outgoing talkback circuits.

The IFB/AUX circuit is always routed/ mixed with the outgoing talkback, if the associated talkback key is on, then the IFB/ AUX audio level is reduced by 20dB, to allow the talkback to be clearly heard over it.

Each if the four IFB/AUX circuits are associated with four talkback outputs, these can be seen on the audio block diagram on page 20.

CONNECTING THE BEATRICE UNITS TO A DANTE NETWORK

The Beatrices are network audio devices utilizing the reliable and versatile Dante audio over IP protocol. Dante is a proprietary system (although very widely used) the originators of which are Audinate.

The information below is only meant as a very basic guide. Full details of the power of Dante network audio and instructions for using it can be found at www.audinate.com

Getting Dante Controller

If you are connecting the Beatrice to a new Dante network the first thing you will need to do is to get the free Dante controller software from Audinate. This can be downloaded by visiting Audinate's web site at www.audinate.com

Connecting Beatrice D16 To the Network

The Beatrice can be connected to the network that you are going to use for your audio distribution simply by plugging in to any one of the RJ45 or SFP network connections on the rear. Once connected to the network it will be possible to see the Beatrice from within the Dante controller and route its' audio circuits.

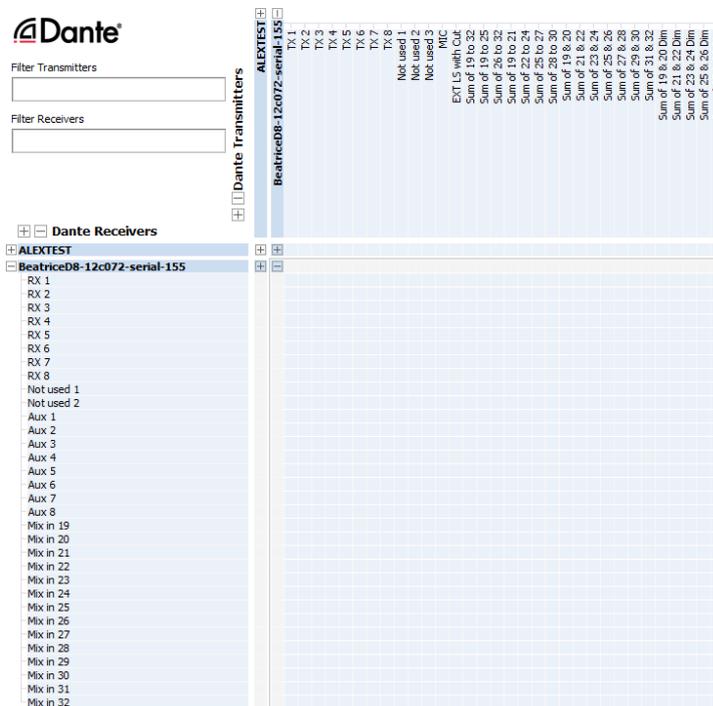
Audio Over IP Network

We strongly recommend that you consider your network topology carefully and would not recommend sharing broadcast audio and general data on the same network.

For more details of audio over IP network structure please visit www.audinate.com

Running Dante Controller

At the time of writing this manual the Dante Controller looks as per the screenshot below:



The Beatrice D8 will have been named at the factory during test to allow them to be identified by the Dante controller.

The format used for the factory name is:

'BeatriceD8-snXXX'

Where 'BeatriceD8' refers to the Glensound product i.e. BeatriceD8.

The '-snXXX' refers to the serial number of the BeatriceD8 which can be found printed on the rear or side of the unit.

The unit may be renamed in Dante controller by opening the 'Device view' window and selecting BeatriceD8 in the drop-down menu. Go to the 'Device Config' tab and change the name with the Rename Device box.

Note if you upload a new DNT file or clear the devices config then the name will change to BeatriceD8-xxXxXx whereby the 'X's refer to the devices MAC address.

Dante Controller TIP

If you have never run Dante controller before then make sure that on the bottom left of the Dante controllers' screen 'P' or 'S' is next to a green square as this indicates that it is connected to a network. By clicking 'P' or 'S' a pop up box opens to allow you to set what network interface the controller is using.

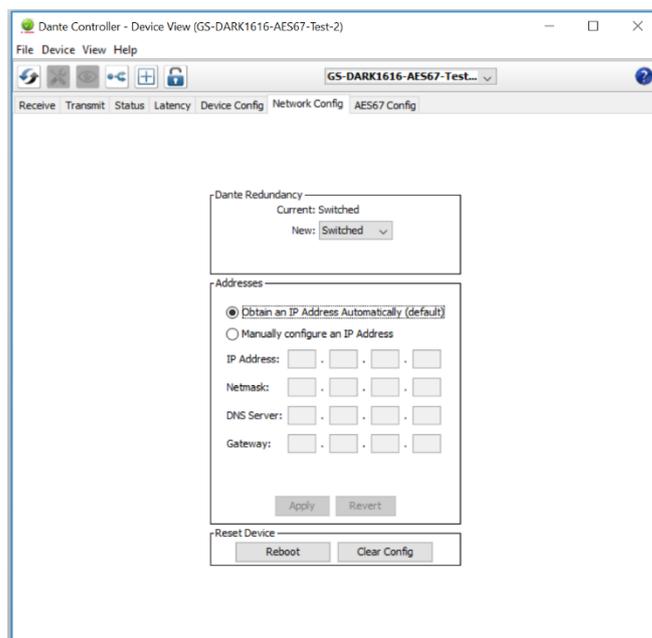
Device Not Showing Up In Dante Controller

If your Dante™ device does not show up in Dante® Controller then the most likely issue is that the device's IP Address is not appropriate for your network.

- A) It maybe that the device is set to obtain an IP address automatically using DHCP (this is the default configuration) and your network is setup for fixed IP addresses only and does not have a DHCP server.
- B) It maybe that the device has had a fixed IP address assigned but that this address is not suitable for your network.

The solution to both scenarios is basically the same.

- 1) You must connect your Dante™ device directly to the Ethernet port of your computer using an Ethernet cable.
- 2) Make sure that your computer is set to 'Obtain an IP address automatically'
- 3) After a few minutes the Dante™ device should now appear in Dante™ Controller.
- 4) Double click the device name to open up device view.
- 5) Open up the 'Network Config' tab
- 6) Either turn on 'Obtain an IP Address Automatically' or correctly configure the 'Manually configure an IP Address' options for your network.
- 7) Click on 'Apply' to confirm the new settings, then disconnect the computer and reconnect the Dante™ device to your network.



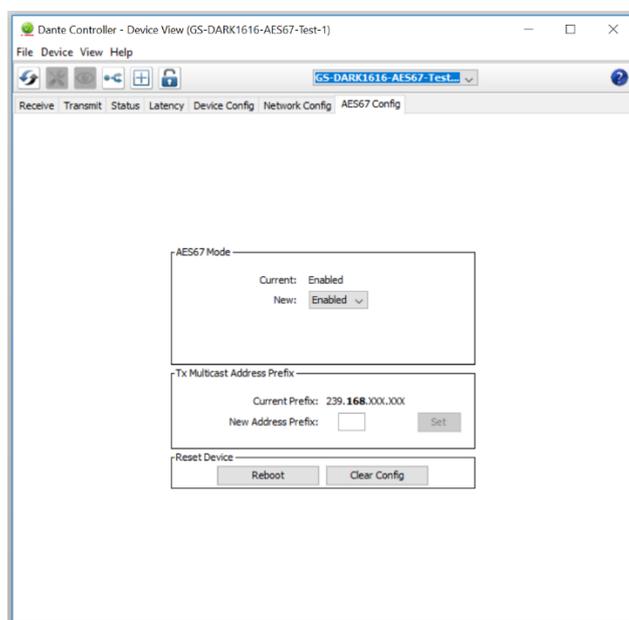
AES67 MODE

The Beatrice uses a module from Audinate called a Brooklyn Module for its network audio interface. Audinate are the company behind Dante™ and as such the module's primary network audio protocol is Dante, however Audinate have enabled their module to comply with AES67 and therefore the Beatrice can be set to AES67 mode for interaction with other AES67 devices.

Please note however that Glensound are relying on Audinate's AES67 interface and are unfortunately not able to provide full AES67 support for the unit. AES67 support should be sought directly from Audinate.

1. Turning On AES67 Mode

If you want to use your Beatrice on an AES67 network and it has not been set to AES67 mode then this can be set in Dante controller by double clicking the Beatrice to open the Device View window where you will find an AES67 tab to enable AES67 support.

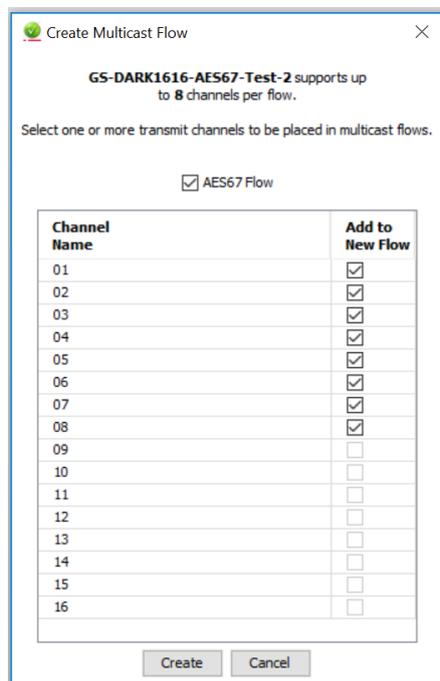


Once the AES67 drop down box has been enabled you'll have to reboot the Beatrice for the change to take effect. After the reboot go back to the AES67 tab and set the multicast prefix address to one that is suitable for your network.

2. Sending AES67 Audio

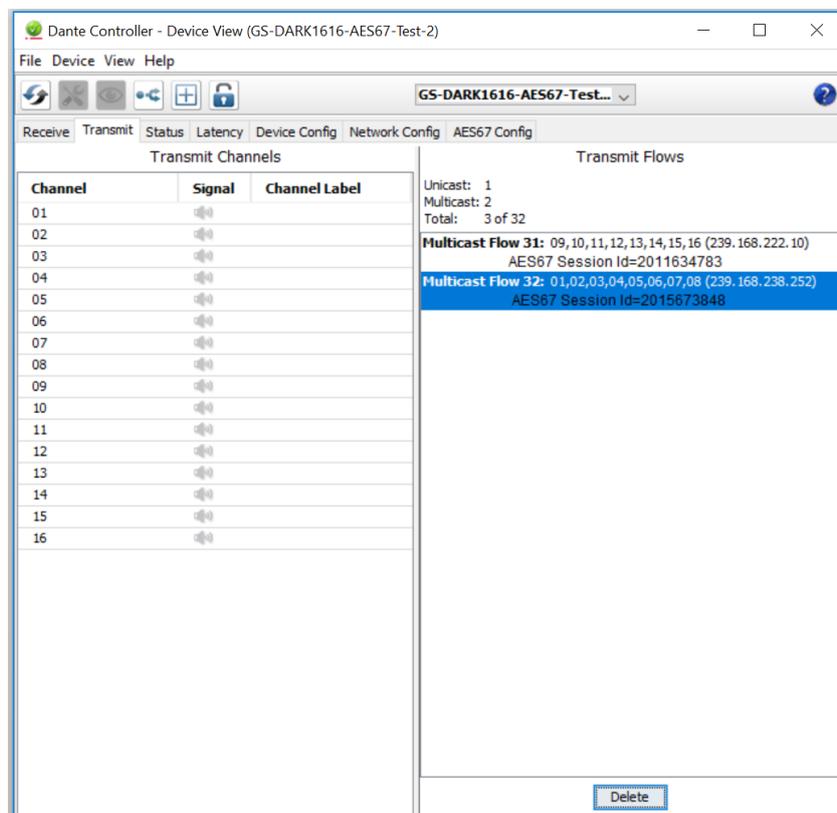
To transmit AES67 audio to the network a multicast flow must first be setup.

This is done by selecting the 'Create New Multicast Flow' Icon  in the Device View.



Tick the AES67 Flow check box, then select up to 8 channels to be included in the flow then click 'Create'

Once set the flows can be seen in the transmit tab of the device view.



3. Receiving AES67 Audio

Once a compatible AES67 stream is detected on the network by Dante Controller the AES67 flows will appear in the Dante Transmitters section in the Routing tab.

4. AES67 Restrictions

AES67 flows can only be generated with the following constraints:

- Multicast Only
- Non-redundant
- Destination address in range 239.nnn.0.0 to 239.nnn.255.255 (239.nnn/16), port 5004
- 48kHz sampling rate
- 24 bit linear (L24) encoding
- 1 msec packet time
- Up to 8 channels per stream

Received AES67 flows have the following constraints:

- Multicast Only
- Non-redundant
- Destination address in range 239.nnn.0.0 to 239.nnn.255.255 (239.nnn/16), port 5004. Must match destination address range.
- 48kHz sampling rate
- L16 or L24 encoding
- 125usec, 250usec, 333usec, 1 msec packet time
- Up to 8 channels per stream

UPDATING THE BROOKLYN MODULE

The Brooklyn module is a device supplied by Audinate that does most of the processing for the actual Dante/ AES67 network audio streams. There is one Brooklyn module in each Beatrice D8. We supply special code (a .dnt file) that sets up/ initiates the Brooklyn module and makes it work in particular way and we also run extra code on its internal microprocessor to make it work correctly with the Beatrice D8.

1. Finding Out Current Installed Version

Open Dante Controller.

Open Device Info tab.

Double Click in the device that you are working with....a new window will open called 'Device View (name of device)

Open the status tab.

The Firmware Version (of the Brooklyn module) will be found under the 'Device Information' heading.

2. Finding Out What The Latest Available Version Is

Go the Beatrice D8's web page at <http://www.glen sound.co.uk/product-details/beatrice-d8/> and open the 'Firmware Latest Version' Tab.

This will give both the latest version numbers/ file names and also the location to download the file from.

3. Updating the Brooklyn Module

The firmware that runs on the Brooklyn module is updated using Audinate's Firmware updating tool. The updating tool and a user guide can be downloaded from Audinate's website:

<https://www.audinate.com/products/firmware-update-manager>

The actual firmware to install using the above tool can currently be downloaded from:

http://www.glen sound.co.uk/Software/Dante/BeatriceD8_v1.0.0_Dante_v4.0.7.8.dnt

When downloading the above file please make sure that you know where your computer has saved it.

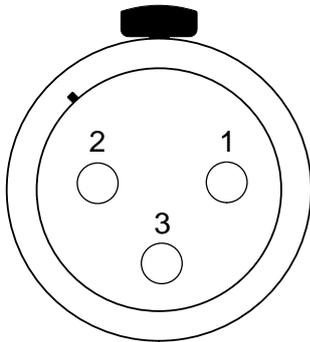
Please note we strongly advise that when you do the update that only your PC and the Beatrice D8 that you want to update are on the network to save accidentally updating the wrong Dante device.

NOTE

Once updated the devices name will change to BeatriceD8-xxXxXx whereby the 'X's refer to the MAC address. We recommend changing the name to something more convenient.

WIRING INFORMATION

XLR & JACK Wiring



XLR SOCKET (FEMALE)

STANDARD XLR AUDIO PINOUTS:

1: Ground/ Earth

2: INPHASE/ POSITIVE/ MIC +

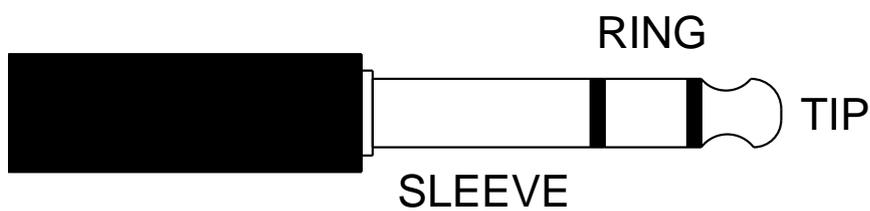
3: MATE/ NEGATIVE/ MIC -

STANDARD HEADPHONE WIRING:

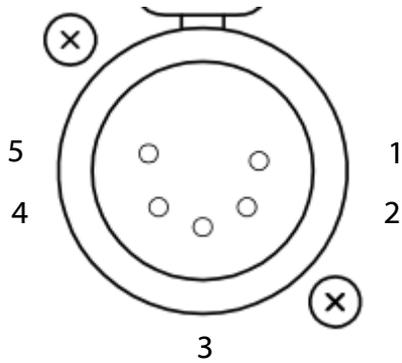
TIP: A/ LEFT Ear

RING: B/ RIGHT Ear

SLEEVE: Common/ Earth

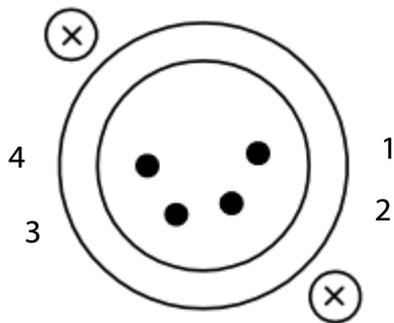


5 & 4 Pin Headset Wiring Options



5 PIN XLR AUDIO PINOUTS:

- 1: MATE/ NEGATIVE/ MIC -**
- 2: INPHASE/ POSITIVE/ MIC +**
- 3: GROUND/ EARTH**
- 4: HEADPHONE LEFT**
- 5: HEADPHONE RIGHT**



4 PIN XLR AUDIO PINOUTS:

- 1: MIC GND/ MIC -**
- 2: INPHASE/ POSITIVE/ MIC +**
- 3: HEADPHONE GND**
- 4: POSITIVE/ HEADPHONE +**