



# USER GUIDE





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**SOUNDCRAFT**



**DELTA  
DLX**

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*USER GUIDE*

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This equipment complies  
with the EMC Directive  
89/336/EEC

For further details contact:

Harman International Industries Ltd,  
Cranborne House, Cranborne Road,  
Potters Bar, Hertfordshire, EN6 3JN, U.K.

Tel: +44 (0) 1707 665000

Fax: +44 (0) 1707 660482

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Issue 1  
Part No. ZZ2812

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Soundcraft Electronics Ltd.  
Cranborne House  
Cranborne Industrial Estate  
Cranborne Road  
Potters Bar  
Herts.  
EN6 3JN  
England

Tel: 0707 665000

Fax: 0707 660482

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# Introduction to Delta DLX

The Delta DLX series comprises a range of input module, output module and frame options that lets you configure the console for a wide variety of applications. The only constraint on the selection and positioning of modules is that any console must have a master module (2 channels width) which must be fitted at the right hand side of the console, and that any group output modules fitted have to be positioned immediately to the left of this.

**Should you wish to replace or add extra modules, please contact your authorised Soundcraft dealer, who can supply the modules and change the configuration without voiding the warranty.**

The system has four group mixing buses, allowing the inclusion of up to four group output modules, and a main stereo mix bus which gives the L + R outputs from the master section. Six auxiliary send buses are provided, giving six independent outputs with master level controls. The master section also contains a monitor switcher which lets you monitor the desk output, an external (stereo) 2-Track return, or a Pre Fade Listen (solo) signal accessing all inputs and groups.

Equalisation is very comprehensive on the input modules, with a 4-band Sweep EQ on the Mono input, and 3-band Sweep EQ on the Stereo and dual line inputs. The stereo input has a further innovation - a stereo Width control, enabling the width of a stereo image to be continuously varied. This is a unique feature on a console of this type, and will find many applications in broadcast and post production.

Delta DLX is available in 8, 16, 24 and 32 channel free-standing consoles, or as an 8-channel rack-mounting console.

# Precautions and Safety Instructions

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## **General Precautions**

Avoid storing or using the mixing console in conditions of excessive heat or cold, or in positions where it is likely to be subject to vibration, dust or moisture. Do not use any liquids to clean the fascia of the unit: a soft dry brush is ideal. Use only water or ethyl alcohol to clean the trim and scribble strips. Other solvents may cause damage to paint or plastic parts.

Avoid using the console close to strong sources of electromagnetic radiation (e.g. video monitors, high power electric cabling): this may cause degradation of the audio quality due to induced voltages in connecting leads and chassis. For the same reason, always site the console power supply away from the unit .

**Caution!** In all cases, refer servicing to qualified personnel.

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## **Handling and Transport**

The console is supplied in a rugged cardboard box. If it is necessary to move it any distance after installation it is recommended that this packing is used to protect it. Be sure to disconnect all cabling before moving. If the console is to be regularly moved (e.g. for touring) we recommend that it is installed in a foam lined flight case. At all times avoid applying excessive force to any knobs, switches or connectors.

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**Power supplies & cables** Always make sure that the power supply has been set to the same source voltage as the mains supply.

Always use the power supply and power cable supplied with the mixer: the use of alternative supplies may cause damage and voids the warranty; the extension of power cables may result in malfunction of the mixing console.

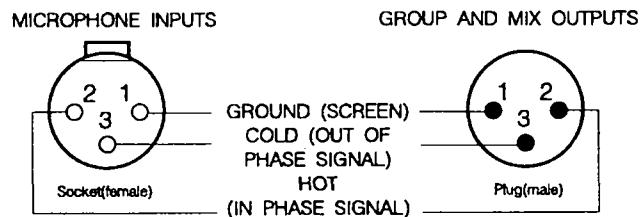
**Warning!** Always switch the power supply off before connecting or disconnecting the console power cable, removing or installing modules, and servicing. In the event of an electrical storm, or large mains voltage fluctuations, immediately switch off the PSU and unplug from the mains.

Always ensure that that you use the correct type of power supply for the size of your console. A CPS150 unit is required for all frame sizes except 32 input consoles and 24 input consoles with 16 or more stereo modules, which must be powered by the CPS450 or CPS450B.

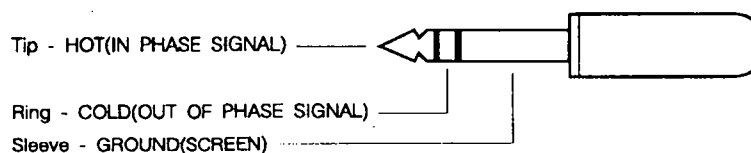
# Connections

## Wiring Conventions

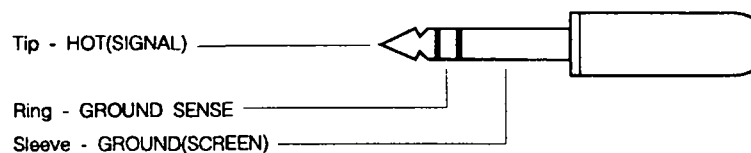
The standard Delta DLX console uses two different types of audio connector, 3 pin XLR (top diagram) and 1/4" three pole (A gauge or stereo) jacks. The latter are used in four different configurations, as shown below. The rear frame of the console has standard apertures fitted with blanking panels. Your Soundcraft dealer can supply a variety of mounting plates to fit these, with EDAC (ELCO) multiway connectors, together with looms to link them to the modules.



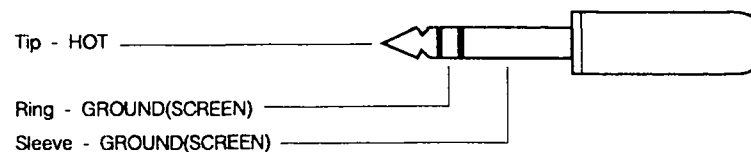
1/4" 'A' Gauge Stereo Jack Plug used as balanced input: line inputs and tape returns



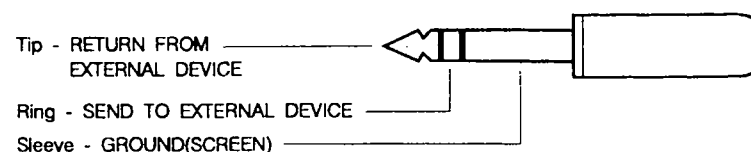
1/4" 'A' Gauge Stereo Jack Plug used as ground compensated output: auxiliary send outputs and control room monitor outputs



1/4" 'A' Gauge Stereo Jack Plug used as unbalanced output: direct outputs



1/4" 'A' Gauge Stereo Jack Plug used as insert send/return



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## Signal Levels

It is important to supply the correct input levels to the console, otherwise signal-to-noise ratio or distortion performance may be degraded; and in extreme cases damage to the internal circuitry may result. Likewise, on all balanced inputs avoid sources with large common mode DC, AC or RF voltages, as these will reduce the available signal range on the inputs. Note that 0dBu = 0.775V RMS.

The microphone input is designed for use with balanced low impedance (150 or 200 $\Omega$ ) microphones.

**Caution!** DO NOT use unbalanced microphones or battery powered condenser microphones with the +48V phantom power switched on: degraded performance or damage to the microphone may result.

The sensitivity of the microphone input is variable from -2dBu to -70dBu (for +4dBu at the Stereo Mix outputs), and the maximum input level (balanced) is 20dB above the set sensitivity that is, with the gain control at minimum, the maximum input level is +18dBu. Although the microphone input can thus handle some line level signals, we don't recommend this, since the source may be unduly loaded by the low (2k $\Omega$ ) input impedance, or be damaged by the +48V phantom power.

The line input has a sensitivity variable between -20dBu and +10dBu, and can also handle a maximum input level up to 20dB above the set value. Note that the maximum input level for unbalanced inputs is 6dB less than that for balanced signals, so very high level unbalanced signals (e.g. loudspeaker outputs of power amplifiers) may cause distortion. The input impedance is approximately 20k $\Omega$ , and thus high impedance sources (e.g. electric guitars) may be loaded too heavily. Such sources are best fed through an external DI (Direct Inject) box to the microphone input.

The main outputs of the console (e.g. Stereo mix, group outputs, aux sends) have a nominal output level of +4dBu, and an impedance of 75ohms. The Stereo mix and Group outputs also have the facility to switch the operating level to -10dBV to allow easy interface to domestic and semi professional equipment. These outputs will deliver full level (+21dBu unbalanced, +27dBu balanced) into loads of greater than 600 $\Omega$ . Secondary outputs, such as channel insert sends and channel direct outputs (all unbalanced) have a nominal output level of -2dBu and a slightly higher output impedance of 200 $\Omega$ , and will only deliver the full output level of +21dBu into load impedances of greater than 5k $\Omega$ .

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# Installation

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# Installation

Delta DLX is designed for reliability, high performance and built to the highest standards. Whilst great care has been taken to ensure that installations are made as trouble-free as possible, care taken at this stage, followed by correct setting up will be rewarded by a long life and reliable operation.

**Warning!** Before switching on your Delta DLX console, check that the mains voltage selector on the power supply unit is set to the correct mains voltage for your area, and that the fuse is of the correct rating. This is clearly marked on the case of the power supply. Do not replace the fuse with any other type, as this could become a safety hazard and will void the warranty.

Always ensure that you use the correct type of power supply for the size of your console. A CPS150 unit is required for all frame sizes except 32 input consoles and 24 input consoles with 16 or more stereo modules, which must be powered by the CPS450 or CPS450B.

---

## **Wiring Considerations**

**A** For optimum performance it is essential for the earthing system to be clean and noise-free, as all signals are referenced to this earth. A central point should be decided on for the main earth point, and all earths should be 'star-fed' from this point. It is recommended that an individual earth wire be run from each electrical outlet, back to the system star point to provide a safety earth reference for each piece of equipment.

**B** Install separate mains outlets for the audio equipment, and feed these independently from any other equipment.

**C** Avoid locating mains distribution boxes near audio equipment, especially tape recorders, which are very sensitive to electro-magnetic fields.

**D** Where possible ensure that all audio cable screens and other signal earths are connected to ground only at their source.

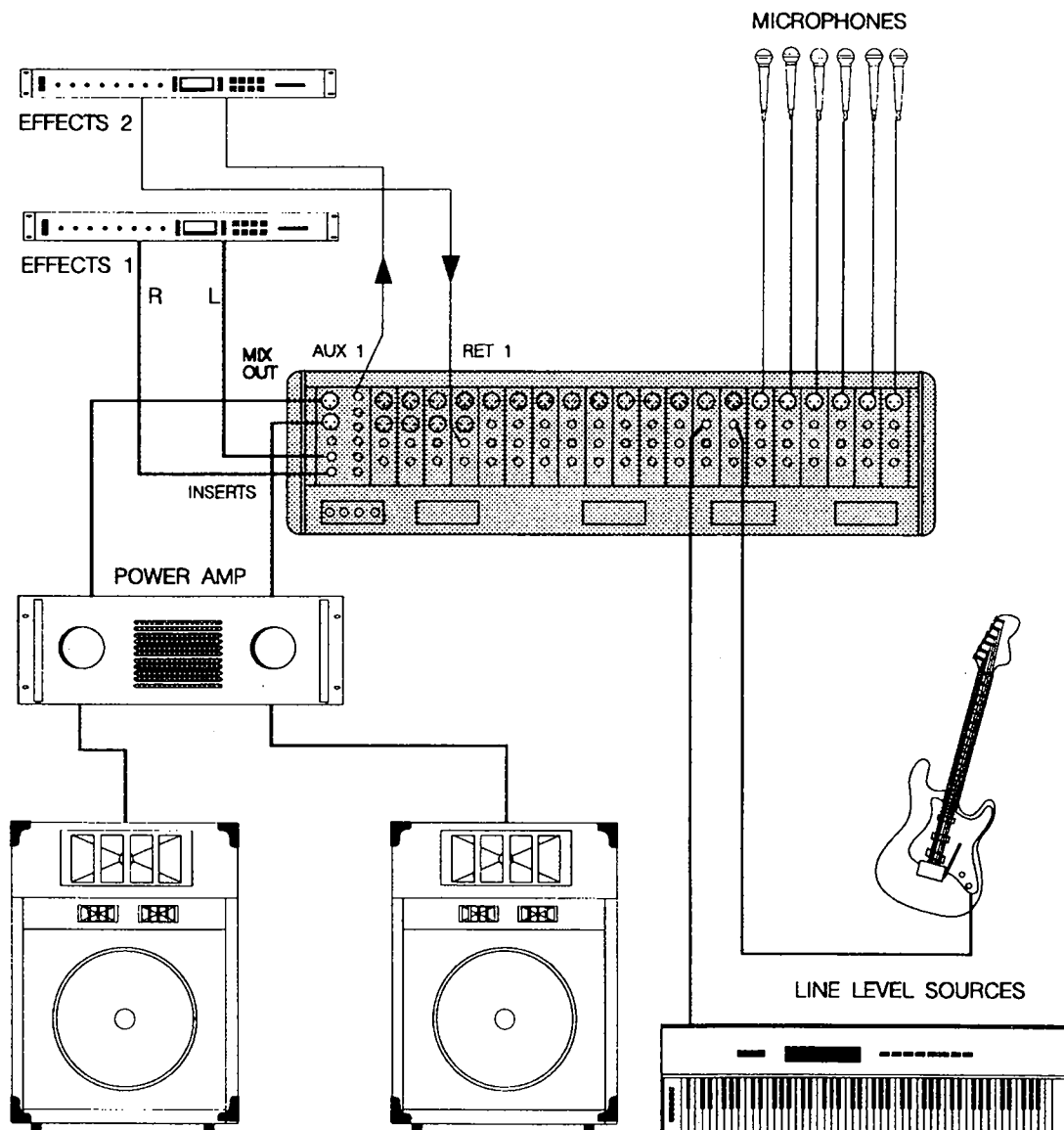
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## **Examples of use**

The diagrams opposite and overleaf show typical applications of the Delta DLX in Sound Reinforcement and Production situations. These examples are of course only a indication of the systems possible with the unique flexibility of the Delta DLX, which may be easily reconfigured to ideally suit your particular requirements.

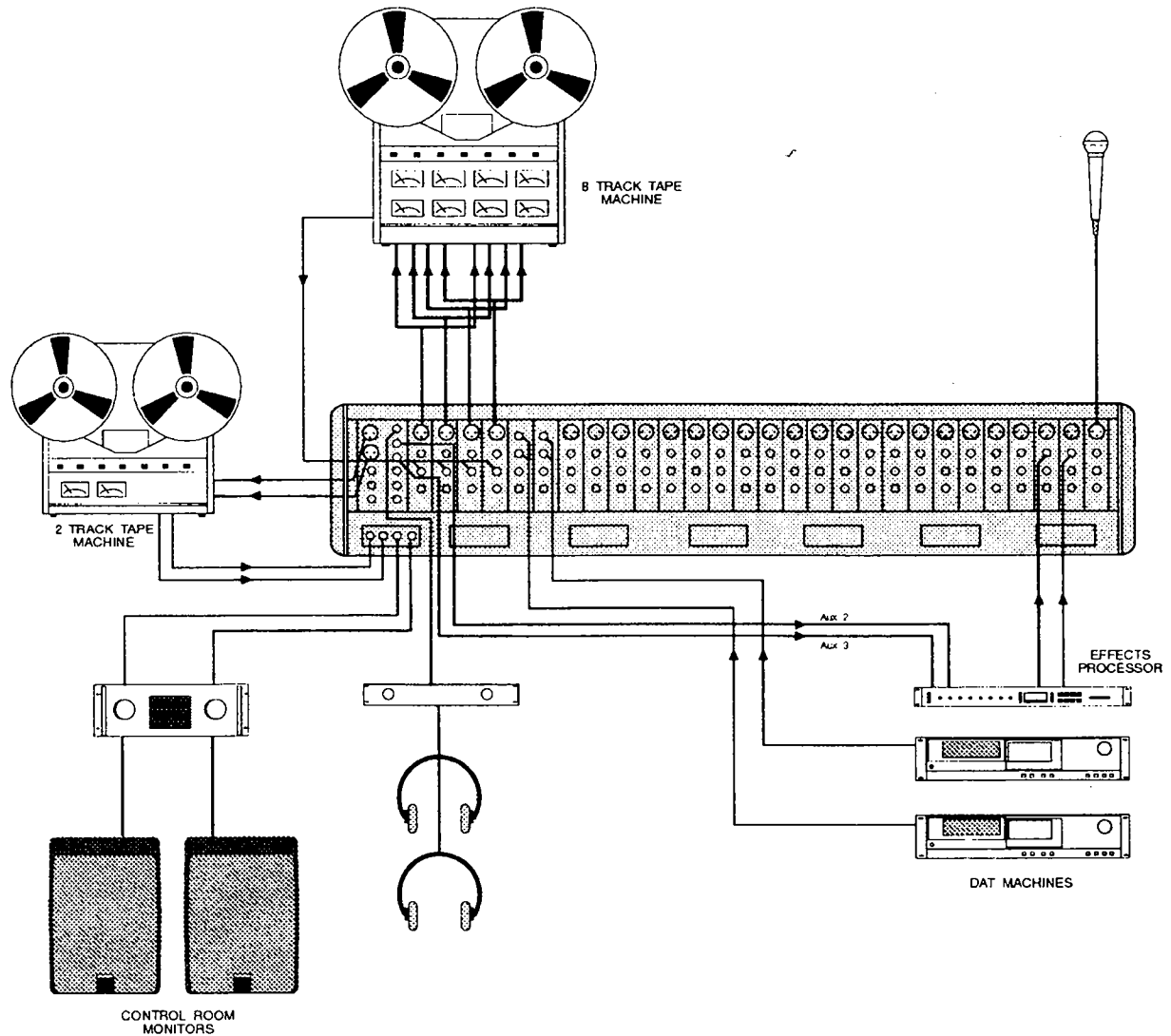
## Sound Reinforcement

This illustration shows the console in use as the front-of-house console in a sound reinforcement system. Microphones covering drums, guitars and vocals are fed to the mic inputs of the mono input modules. Keyboards and other line level sources are fed to line inputs, and stereo modules could be fitted in these positions as an alternative. The Stereo mix is fed to the main speakers, with a stereo effects unit available via the mix inserts. A separate effects unit is accessed via Aux 1, and returned to the console on the Return of one of the Group modules. Other Aux outputs may be used for foldback or other outboard equipment.



## Production

The illustration shows a typical production application. Microphone sources are connected to mono inputs, DAT machines, cart machines etc. are accommodated by Stereo inputs, and these can be routed to the four groups feeding an 8-track tape machine as required. The tape outputs are monitored through the 'A' & 'B' returns on the Groups. Aux 1 is used for foldback, and Aux 2 and 3 feed an effects processor, the output of which is returned via two line inputs. The 2-track tape machine takes the stereo mix, and is monitored on the 2-track tape return.

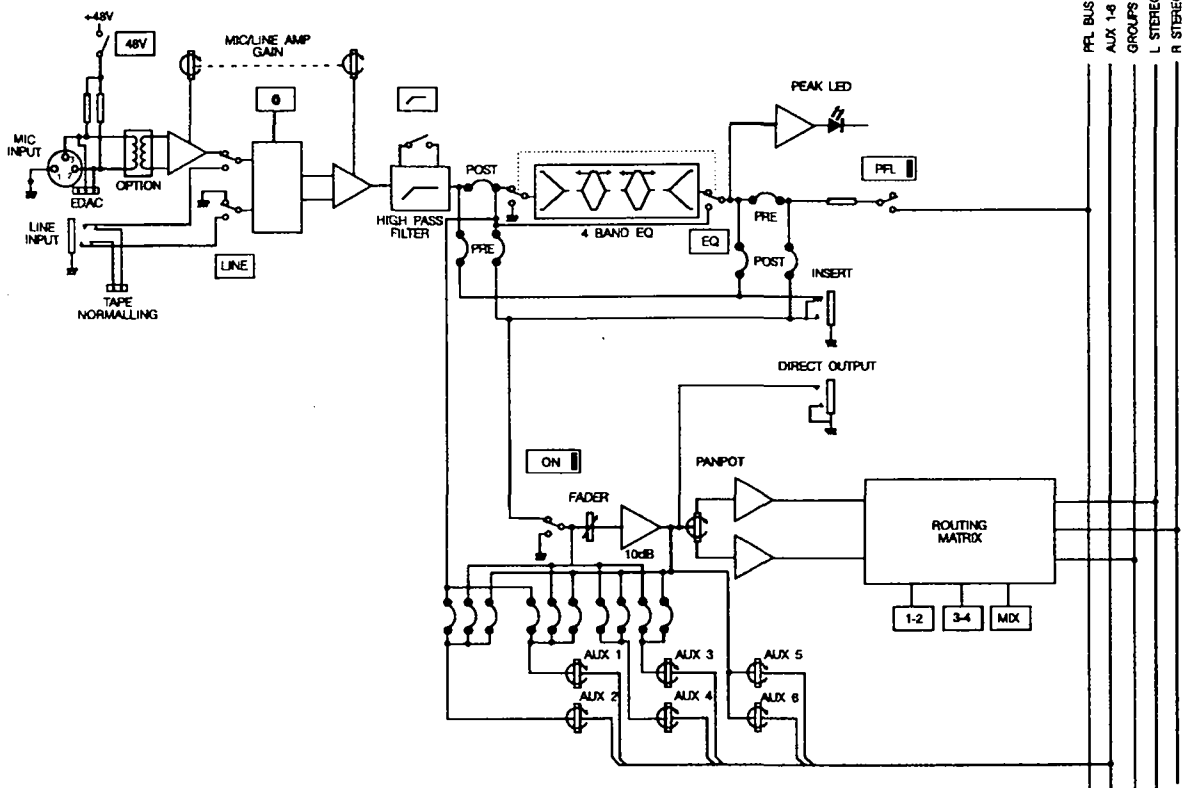


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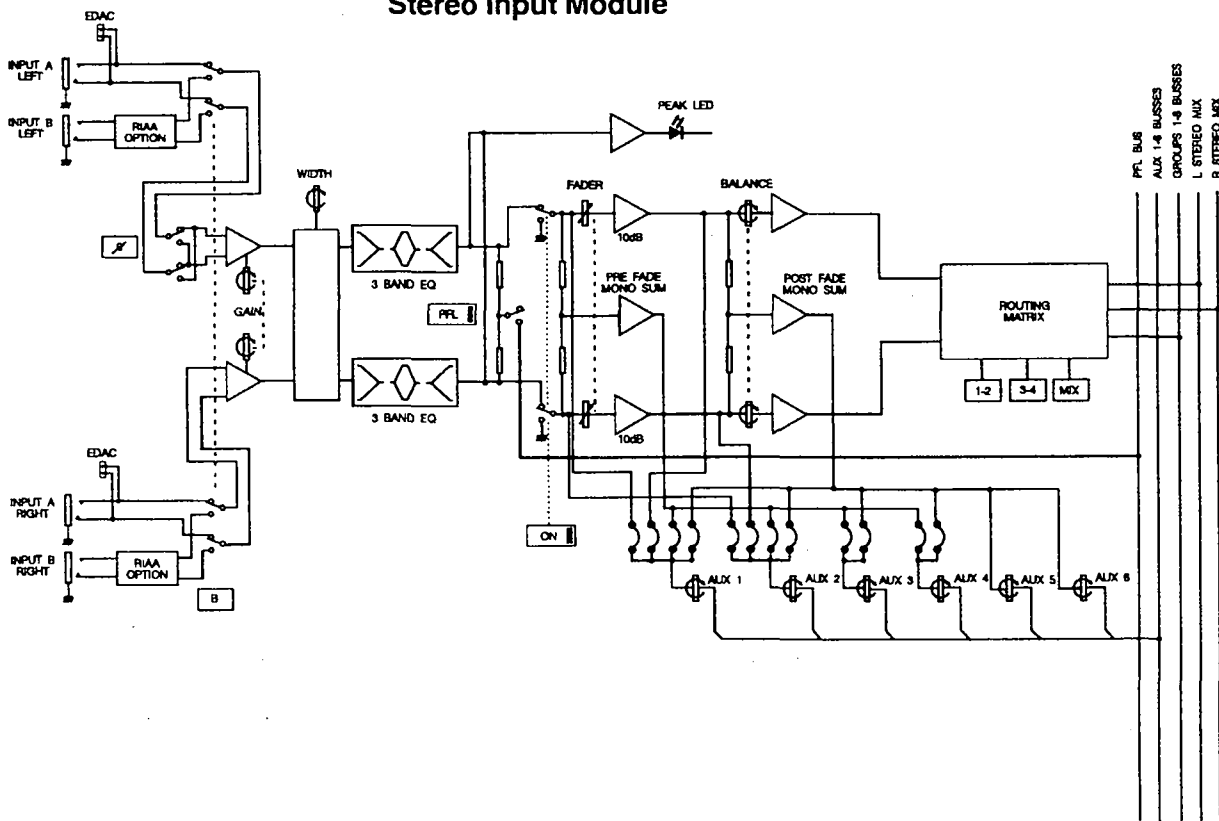
# Module Block Diagrams

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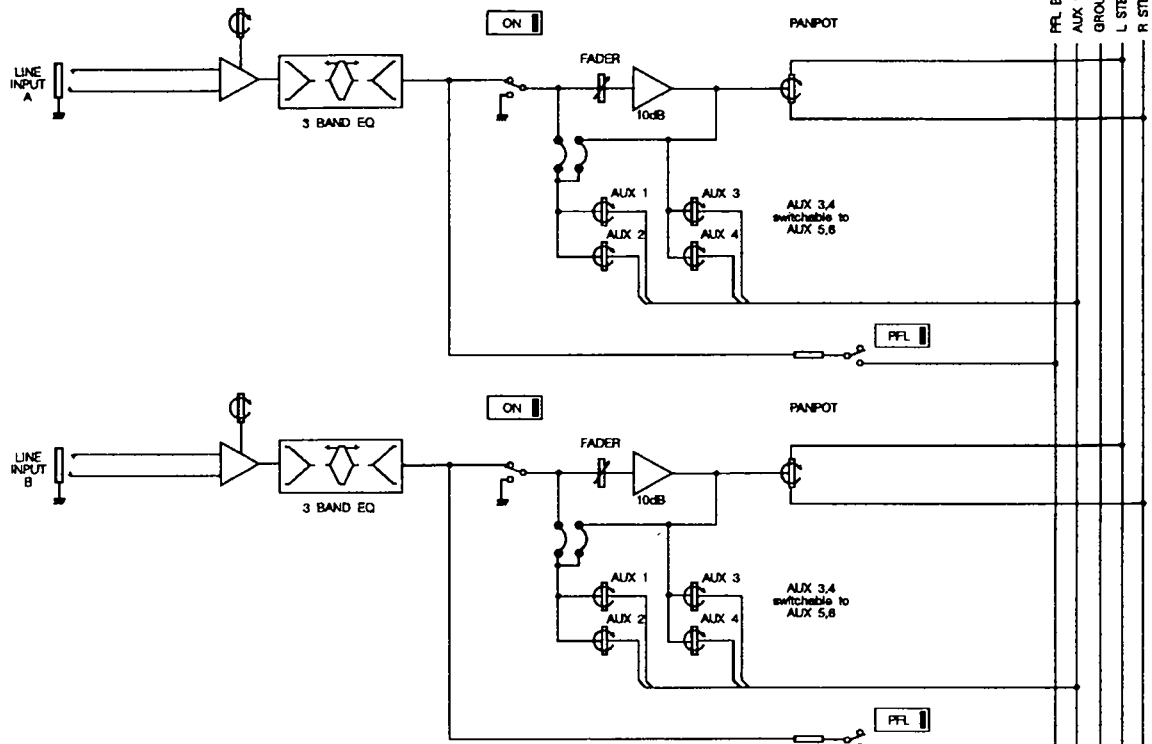
### Mono Input Module



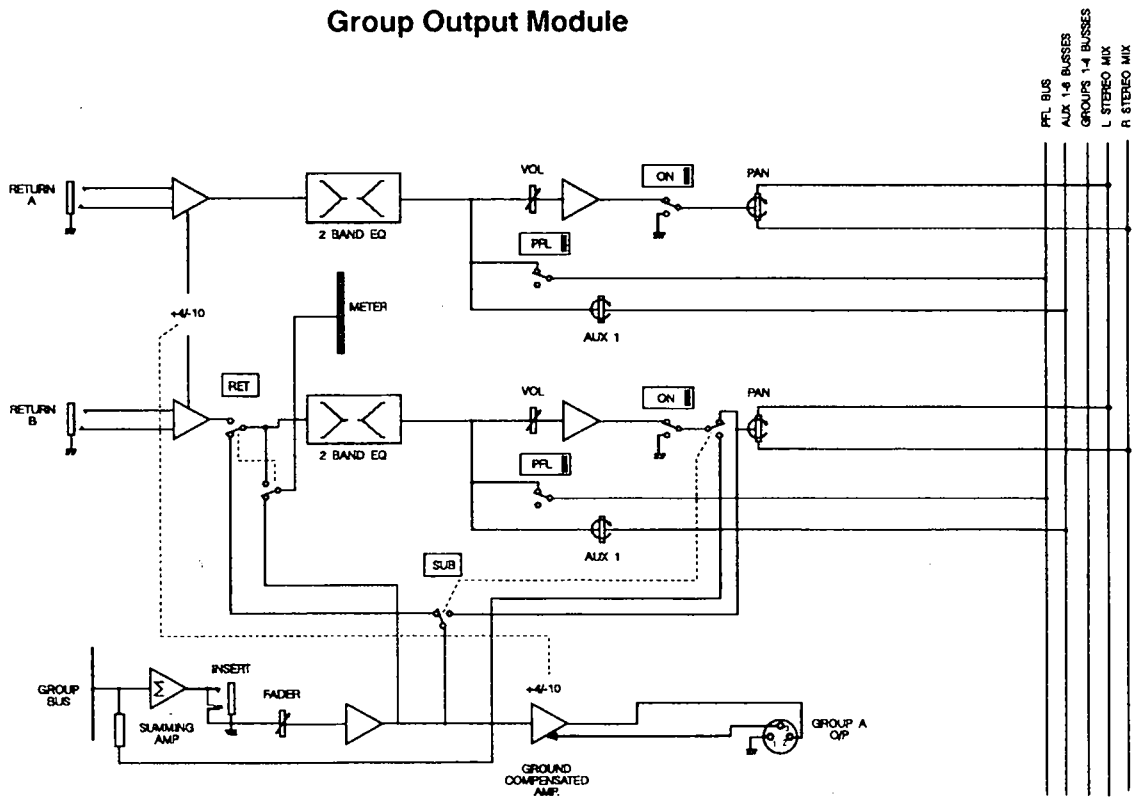
### Stereo Input Module



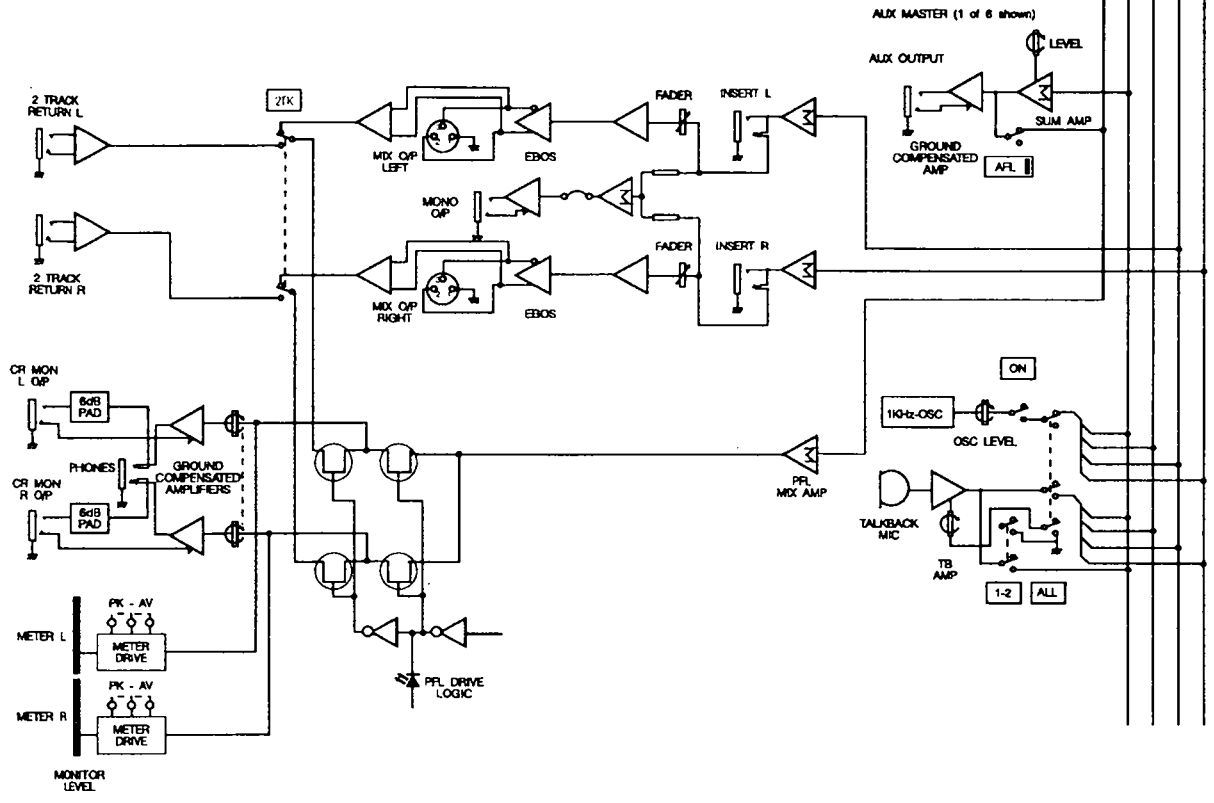
### Dual Line Input Module



### Group Output Module



# Master Module

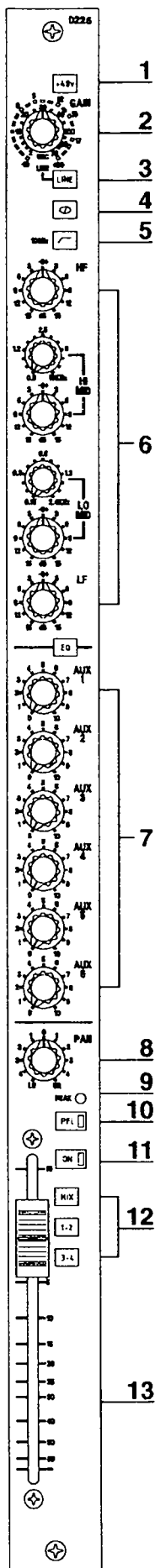


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## **D225 Mono Input Module**

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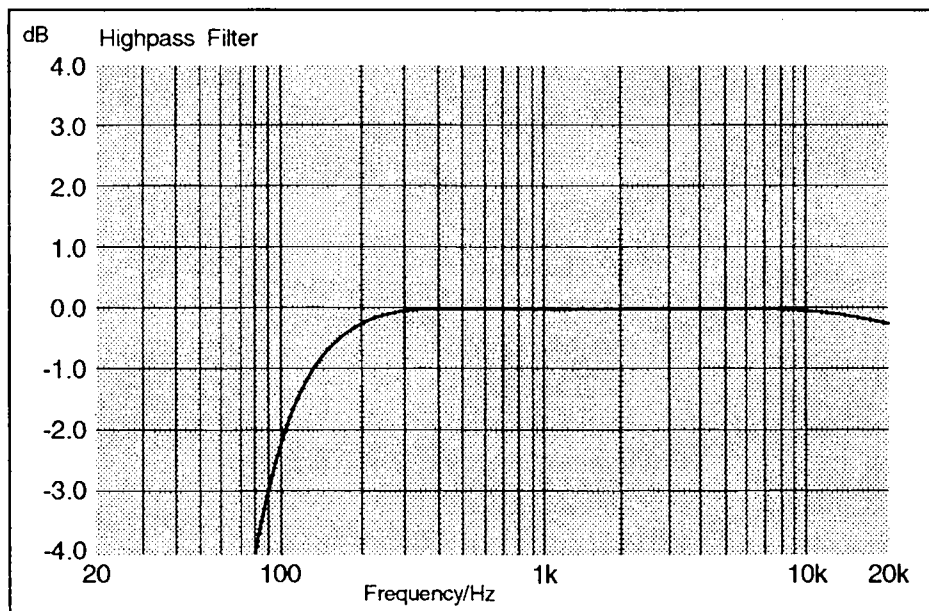
# D225 Mono Input Module



## Channel Input

- 1 +48V switch applies 48V phantom power to the microphone input.
- 2 GAIN adjusts the sensitivity of both mic and Line inputs. Mic input sensitivity: -2dBu to -70dBu. Line input sensitivity: -20dBu to +10dBu.
- 3 LINE selects the line input to the channel.
- 4 Ø (PHASE) reverses the phase of the selected input, to compensate for different wiring standards and conflicting microphone placement.
- 5 HI-PASS FILTER inserts a 100Hz second order filter immediately after the input amplifier. This is especially useful for counteracting the proximity effect experienced with directional microphones, and eliminating low frequency spill and interference.

## Frequency Response Curves of the Hi-Pass Filter

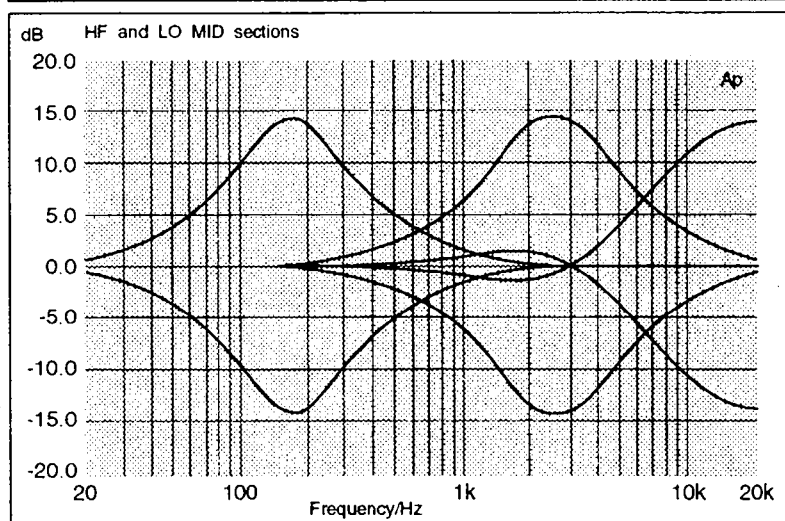
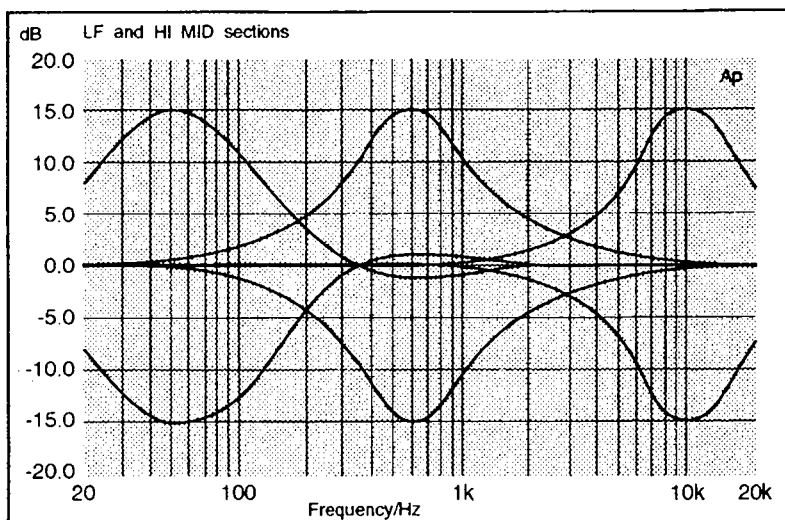


## Equaliser

- 6 The equaliser is a 4-band semi-parametric. HF. +/- 15dB shelving at a fixed frequency of 12kHz. HI MID. +/- 15dB peaking between 0.6 - 10kHz. Q = 1.5 LO MID. +/- 15dB peaking between 0.15 - 2.5kHz. Q = 1.5 LF. +/- 15dB shelving at a fixed frequency of 60Hz, with 30Hz VLF rolloff. The cut/boost controls are centre detented, the centre position giving a flat response.

EQ switches the equaliser into the signal path when pressed.

## Frequency Response Curves of the Equaliser



### Auxiliaries

**7** Six **AUXILIARY SENDS** are provided: Aux sends 1 through 4 have their sources individually selectable by internal jumpers. 1 & 2 can be: pre-EQ, pre-fade, or post-fade. 3 & 4 are either pre- or post-fade. The factory fitted default is AUX 1 and 2 pre-fade, AUX 3 and 4 post-fade. Aux sends 5 and 6 are permanently sourced post-fade.

### Routing

**8** **PAN** determines the position of the signal within the stereo image. In the centre position (detented) there is a 4.5dB level drop. Pan left feeds the signal to odd numbered busses, pan right to even busses. Panning fully left or right sends signal to only the left or right side respectively.

**12** Three routing switches give access in pairs to MIX left and right busses and 4 group busses. The signal may be routed to an individual bus by using the relevant routing switches with the PAN control turned fully left or right. It is recommended that the routing is deselected on any unused channels to maximise the audio performance of the console.

### Channel Status

**9** The **PEAK** LED illuminates 7dB below clipping point, ie, it illuminates when a level of +14dBu is present within the module. It is sourced from the insert send.

**10** The illuminated **PFL** switch feeds the pre-fade signal into the monitor system, where it replaces the selected monitor source.

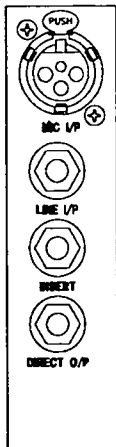
**11** The illuminated **ON** switch enables the post EQ, post insert channel signal path: when off, all auxiliary sends except those selected pre-EQ, and all routing outputs are muted. We recommend that you switch all unused channels 'off', to prevent unwanted noise being added to any parts of the mix.

**13** The fader is a 100mm Alps type, with 10dB gain, and this is the main level control of the channel, with a long throw to enable rapid and accurate control of the channel output level. When mixing, you will get optimum headroom and signal-to-noise ratios by keeping the fader at about the unity gain (0) mark; avoid running the input **GAIN** too high, and the fader resultingly low, since this gives very little headroom. Similarly, running the input **GAIN** very low, and the fader fully up (10dB of gain) will increase noise levels, and does not allow any increase in gain on the fader should the source signal level drop unexpectedly.

The insert point is link selectable to be either pre- or post-EQ. The factory fitted default is post-EQ. Both the send and the return are unbalanced and at a level of -2dBu.

An unbalanced direct output is provided at a nominal level of -2dBu at the rear panel jack socket.

The rear connector panel is integral to the module and houses all external interface connectors as shown on the left.



#### Rear Connector Panel

##### Mic I/P Female XLR

Pin 1	Screen
Pin 2	Hot
Pin 3	Cold

##### Line Input 3 Pole Jack

Tip	Hot
Ring	Cold
Sleeve	Screen

##### Insert 3 Pole Jack

Tip	Return
Ring	Send
Sleeve	Screen

##### Direct Output 3 Pole Jack

Tip	Hot
Ring	Ground
Sleeve	Screen

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## Specification

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### **Microphone Input:**

Electronically balanced, transformer option (Sowter 7026).

Input impedance	>2k ohms
Maximum I/P level	+18dB
Sensitivity range	-2 to -70 dBu
CMRR at max gain	>70dB at 1kHz
EIN 150R source	<-127.5dBu at max. gain.

### **Line Input:**

Electronically balanced.

Input impedance	>10k ohms
Maximum I/P level	+27dBu
Gain range	-20 to +10dBu.
CMRR at max gain	>40dB constant with frequency
EIN, 150R source	<-90dBu at +4dBu sensitivity
Frequency response	+/-0.5dB 20Hz - 20kHz.

### **Equaliser:**

Boost/cut range	+/-15dB
Break Frequencies	HF 12kHz shelving, 2nd order. HI MID 0.6 - 10kHz peaking, Q=1.5 LO MID 0.15 - 2.5kHz peaking, Q=1.5 LF 60Hz 2nd order shelf with 30Hz VLF rolloff.
Highpass filter	-3dB at 100Hz, 2nd order Butterworth (maximally flat).

### **General:**

Insert send level	-2dBu, unbalanced.
Insert send max. O/P	+20dBu into 2k ohms.
Direct output level	-2dBu, unbalanced.
Direct output max. O/P	+21dBu into >5k $\Omega$ .
ON switch "off" ratio	>100dB @ 1kHz, >90dB @ 10kHz
Fader off ratio	>85dB @ 1kHz, >80dB @ 10kHz Reference 0dB.
Panpot crosstalk	<-85dB @ 1kHz, 80dB @ 10kHz.
Routing off ratio	1kHz >95dB; 10kHz >90dB
Aux send off-ratio	>80dB @ 10kHz, >85dB @ 1kHz.
THD +20dBu at LINE IN	<0.005% @ 1kHz, <0.015% @ 10kHz.

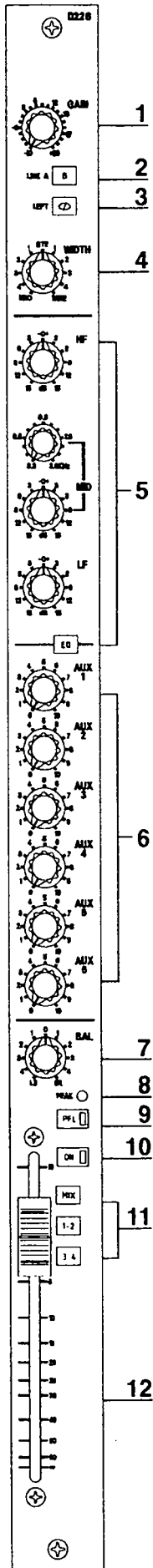
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## **D226 Stereo Input Module**

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# D226 Stereo Input Module



## Channel Input

**1 GAIN** adjusts the sensitivity of the line inputs of both channels from -20dBu to +10dBu.

**2 B** selects the alternative B inputs which may be fitted with an RIAA preamp option.

**3 Ø LEFT** reverses the phase of the left channel of the selected input.

**4 WIDTH** is a continuously variable control which allows the width of the stereo image to be varied from mono (ACW) through stereo (centre detent) to phase enhanced wide stereo (CW).

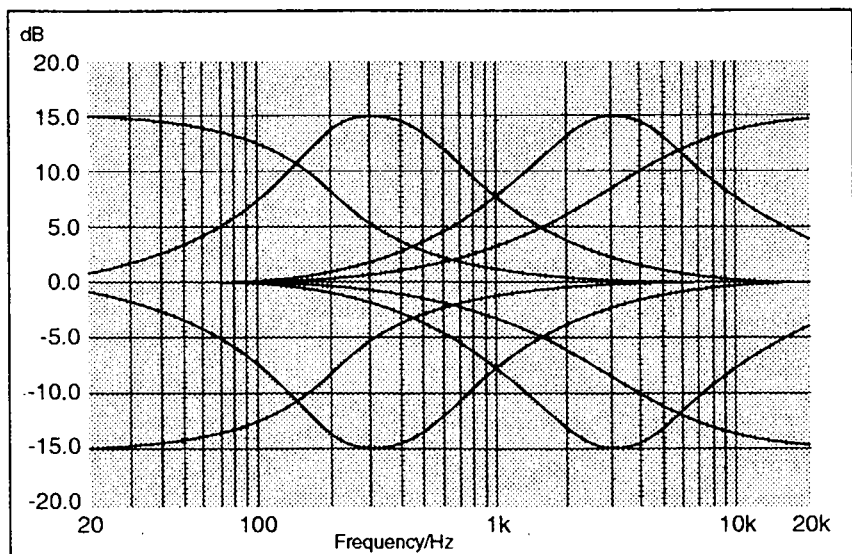
## Equaliser

**5 The EQ SECTION** is 3-band semi-parametric. HF. +/- 15dB shelving at a fixed frequency of 12kHz. MID. +/- 15dB peaking between 0.3 - 3kHz. Q = 1.0 minimum. LF. +/- 15dB shelving at a fixed frequency of 60Hz. The cut/boost controls are centre detented, the centre position giving a flat response. EQ switches the equaliser into circuit.

## Auxiliaries

**6 Six AUXILIARY SENDS** are provided: Auxiliary sends 1 and 2 are internally individually link selectable for pre or post fade, and mono or stereo operation: when stereo is selected, the left channel feeds AUX 1, and the right AUX 2. The factory default is AUX 1 and 2 pre fade, mono. AUX 3 through 6 are permanently sourced mono, with AUX 3 and 4 link selectable to be pre fade or post fade (default), whilst AUX 5 and 6 are permanently post fade.

## Frequency Response of the Equaliser



## Routing

**7** The **BAL** (balance) control determines the relative level of the L and R signals. In the centre position (detented) its gain is unity. Turning it fully CW increases the right signal by +4.5dB, and totally kills the left signal. Full ACW rotation has the opposite effect. Balance left biases the signal to odd numbered busses, balance right to even busses.

**11** Three **ROUTING SWITCHES** give access in pairs to MIX left and right busses and 4 group busses.

## Channel Status

**8** The **PEAK** LED illuminates 7dB below clipping point, ie, it illuminates when a level of +14dBu is present within the module. It is sourced from the post EQ signal.

**9** The illuminated **PFL** switch feeds the pre-fade signal into the monitor system, where it replaces the selected monitor source.

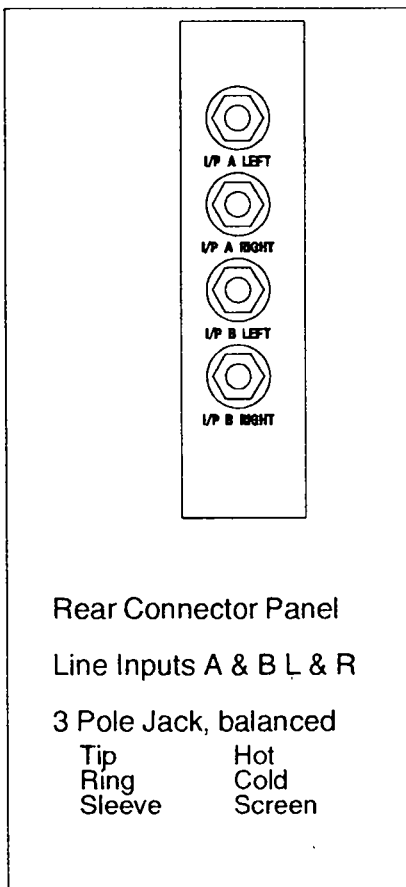
**10** The illuminated **ON** switch enables the post EQ signal path.

**12** The **FADER** is a stereo 100mm Alps type, with 10dB gain.

The inputs are electronically balanced.

Line Input A has provision for optional EDAC multicore interfacing. The signal from the Line multicore parallels the input.

The rear connector panel is integral to the module and houses the 4 external interface connectors as shown on the left.



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## Specification

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### **Line inputs**

Electronically balanced.	
Input impedance	>10k ohms.
Maximum input level	+27dBu.
Sensitivity range	-20 to +10dBu
CMRR	>40dB @ 1kHz.
Frequency response	+/-0.5dB 20Hz - 20kHz.

### **Equalisation**

Boost/cut range	+/-15dB
Break frequencies	HF 12kHz shelving MF 0.3 - 3kHz peaking, Q=1 LF 60Hz shelving

### **General**

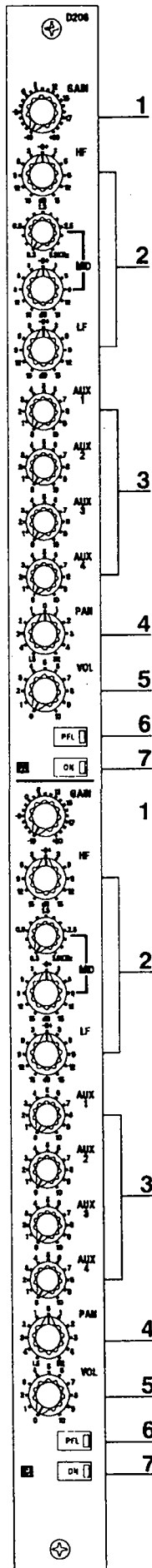
ON switch off ratio	>95dB @ 1kHz, >90dB @ 10kHz
Fader off ratio	>85dB @ 1kHz, >80dB @ 10kHz
Balance pot off ratio	<-85dB @ 1kHz, <-80dB @ 10kHz
Routing off ratio (16 CH routed)	>90dB @ 1kHz, >80dB @ 10kHz.
L/R crosstalk, width control at centre	<-60dB @ 1kHz.
THD	<0.005% @ 1kHz, <0.015% @ 10kHz

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## **D206 Dual Line Input Module**

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# D206 Dual line input module



The dual line input module comprises two identical channels, each outputting to the stereo mix bus.

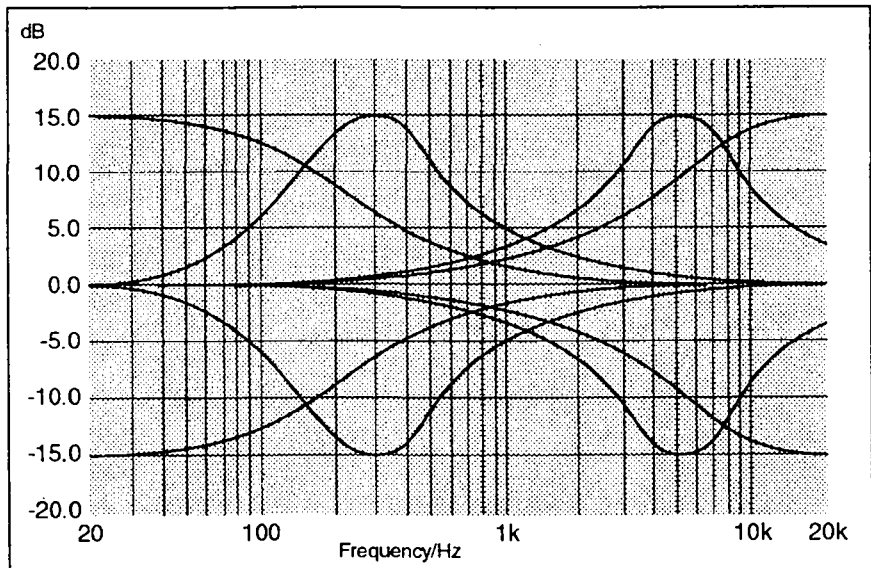
## Channel input

1 The **GAIN** control adjusts the sensitivity of the line input from +10dBu to -20dBu.

## Equaliser

2 Each dual line input channel is provided with a 3 band **EQUALISER** comprising shelving HF and LF controls, and a peaking MID control, with a frequency control that allows the selection of centre frequencies between 300Hz and 5KHz. Centre detents on the controls indicate the positions for a flat response.

## Frequency Response Curves of the Equaliser



## Auxiliaries

3 Four **AUXILIARY SEND** controls are provided: AUX 1 and AUX 2 are factory linked to be fed from a post EQ, pre fader signal, which can be changed to a post EQ, post fade signal if required: see the Delta DLX technical manual for details. AUX 3 and AUX 4 are fed post EQ, post fader, so their levels follow the channel output level set by the fader. Their output is normally routed to Aux sends 3 and 4, but can be changed to Aux sends 5 and 6 by internal switches: again see the technical manual for details.

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## Routing

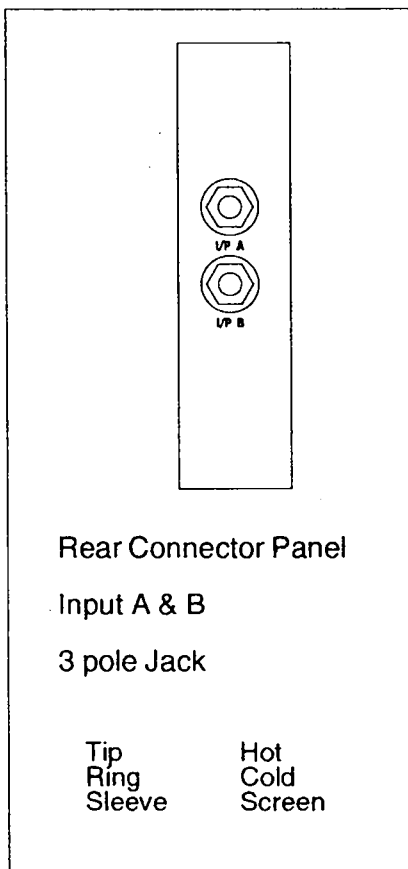
4 The **PAN** control determines the relative levels sent to the L and R outputs. In the centre, equal levels are sent to both sides (with a 4.5 dB level drop relative to fully clockwise or anticlockwise). Rotation fully anticlockwise sends full level to the left bus, cutting the send to the right bus; rotation fully clockwise does the opposite.

## Channel status

5 The rotary channel **FADER** (VOL) is the main level control of the channel. When mixing, you'll get optimum headroom and signal to noise ratios by keeping the fader at about the unity gain (7) mark: avoid running the input **GAIN** too high, and the fader commensurately low, since this gives very little headroom. Similarly, running the input **GAIN** very low, and the fader fully up (10dB of gain) will increase noise levels, and does not give any available increase in gain on the fader should the source signal level drop unexpectedly.

6 The red illuminated **PFL** switch feeds the post EQ, pre fader signal to the CR monitor outputs (or headphones jack), via the CR Monitor level control, replacing the signal currently feeding those outputs. The red **PFL** LED adjacent to the monitor control on the master module will light to indicate the monitoring status. **PFL** signals from different sources will be summed.

7 The **ON** switch enables the post EQ signal path: when 'off', all auxiliary sends and L/R outputs are muted. We recommend that you switch all unused channels 'off', to prevent unwanted noise being added to any parts of the mix.



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## Specification

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### **Line Input**

Electronically balanced	
Input Impedance	>10k $\Omega$
Maximum Input before clipping	+27dBu
Sensitivity Range	-20 to +10dBu for +4dBu output
CMRR	>40dB at 1kHz
Frequency response	+/-0.5dB 20Hz - 20kHz.

### **Equalisation**

Boost /cut range	+/-15dB
HF	8.5kHz shelving
MF	0.3 - 5kHz peaking, Q=1.3
LF	110Hz shelving

### **General**

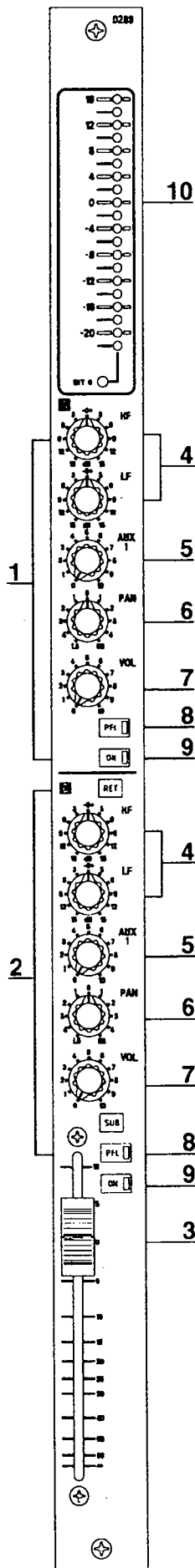
ON switch rejection	>95dB at 1kHz; >85dB at 10kHz
Fader rejection	>80dB at 1kHz; >75dB at 10kHz
Panpot rejection	>65dB at 1kHz; >65dB at 10kHz
Aux send rejection	>80dB at 1kHz; >80dB at 10kHz
THD (+20dBu in)	0.005% @ 1kHz; 0.01% @ 10kHz

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## **D203 Group Output Module**

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# D203 Group Output module



## Return

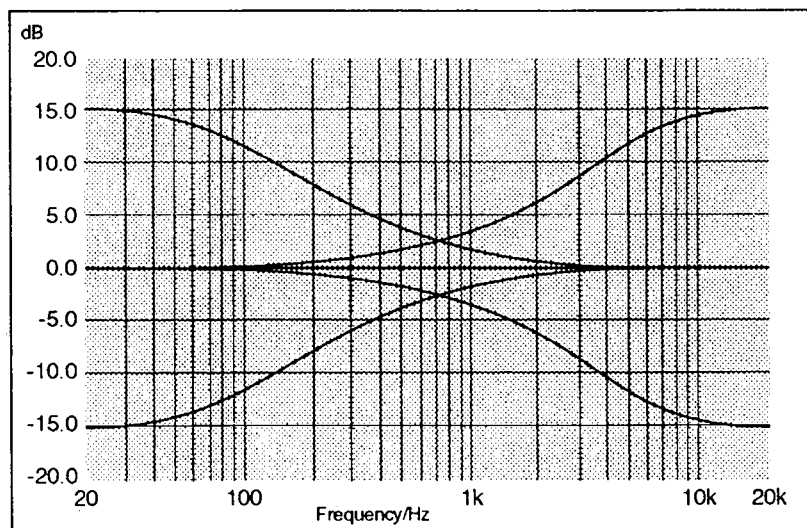
**1 UPPER RETURN:** In normal operation this input is fed from the Multitrack Tape Returns 9-16 rear connector panel. Inserting a jack into the **RETURN A** socket overrides this signal, allowing an external signal to be returned to the stereo mix bus.

**2 LOWER RETURN:** This input is fed from the group output or, if the **RET** switch is pressed, an external return signal from the Multitrack 1-8 rear connector panel. It feeds the stereo mix buss. The **SUB** switch converts the group into a sub-group, feeding the group mix signal directly to the stereo mix via the return **PAN** control. If the **SUB** and **RET** switches are both pressed, then the return signal is routed to the group mix, which is in turn routed to the stereo mix: thus the return signal is under control of the group fader. The diagram on the next page shows how **SUB** and **RET** affect the signal path. Inserting a jack into the **RETURN B** socket overrides the signal from the Multitrack Returns rear connector panel, allowing an external signal to be returned to the mix bus or group.

## Equaliser

**4** Each return is provided with a 2-band **EQUALISER**, the centre detented controls giving shelving characteristics at 5kHz (HF), and 100Hz (LF).

## Frequency Response Curves of the Equaliser

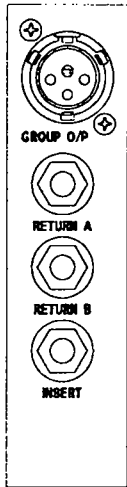


## Auxiliary

**5** The **AUX 1** control gives a pre fade feed to Auxiliary send 1, enabling the return signals to be sent to a foldback mix, unaffected by the position of the **ON** switch.

## Routing

**6** The **PAN** control sets the position of the return signal across the stereo mix.



Rear Connector Panel

Group Output 3 Pin XLR

Pin 1	Screen
Pin 2	Hot
Pin 3	Ground Sense (cold)

Tape Returns, 3 Pole Jack

Tip	Hot
Ring	Cold
Sleeve	Screen

Insert, 3 Pole Jack

Tip	Return
Ring	Send
Sleeve	Screen

Status

**3** Group **FADER**: This 100mm fader controls the level of the Group mix and Group output. The nominal output level may be set at either +4dBu, or -10dBV by an internal switch: see the Delta DLX technical manual for details.

**7** The **VOL** control determines the level of the return signal.

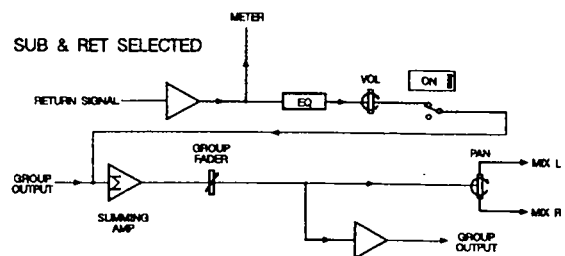
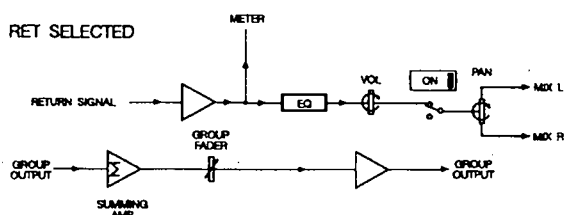
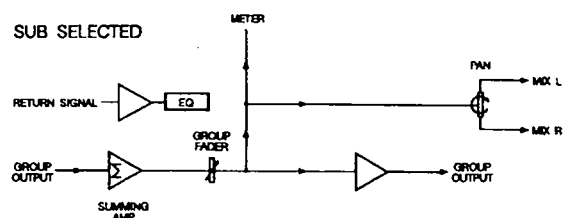
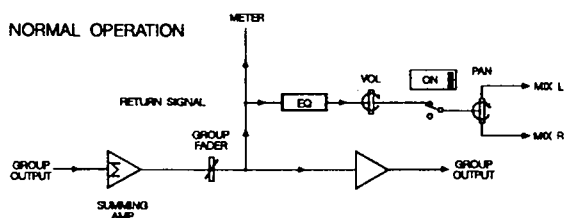
**8** The red illuminated **PFL** switch feeds the post EQ, pre fader signal to the CR monitor outputs (or headphones jack), via the CR Monitor level control, replacing the signal currently feeding those outputs. The red **PFL LED** adjacent to the monitor control on the master module will light to indicate the monitoring status. PFL signals from different sources will be summed.

**9** The **ON** switch enables the return signal. If the return is not being used it should be switched 'off', to obtain the best noise performance from the console.

An insert point is provided in the signal path of the group so that an external processing device can be inserted.

**10** The LED bargraph meter indicates the Group output level, and is jumper selectable for peak or average response: see the Delta DLX Technical Manual for details.

Note: For operation with a 8-track tape machine, parallel the group outputs in pairs to the tape machine inputs, e.g. Group 1 to 1&5, Group 2 to 2&6 etc.



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## Specification

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### **Group Output**

Ground Cancelling.	
Nominal output level	+4dBu/-10dBV, selectable.
Maximum output level	+21dBu into 600 $\Omega$
Output impedance	75 $\Omega$
Group -> group crosstalk	<-85dBu @ 1kHz, <-80dBu @ 10kHz.
Fader off ratio	>80dB @ 1kHz, >75dB @ 10kHz.
Bus residual noise	<-93dBu.
Group bus noise, (36 CH routed)	<-80dBu.
THD	<0.005% @ 1kHz, <0.01% @ 10kHz.

### **Group Insert**

Insert send level	-2dBu, unbalanced.
Insert send max. O/P	+20dBu into 2k $\Omega$
Insert return impedance	10k $\Omega$

### **Tape/Effects return**

Electronically balanced.	
Input impedance	10k $\Omega$
Nominal input level	+4dBu/-10dBV, selectable.
Maximum input level	+21dB above nominal.
ON switch off ratio	>90dB @ 1kHz, >70dB @ 10kHz.

### **Equalisation**

2-band shelving.	
Boost/cut range	+/-15dB.
Break frequencies	HF 5kHz. LF 100Hz.

### **Metering**

20 segment LED bargraph.	
Response	Peak or average reading
Rise time to -1dB	150m sec, average 4m sec, peak
Decay time to -20dB	250m sec, average 1.2 sec, peak.
Accuracy relative to 0dB	+/-1dB.
Calibration range	0db = -2dBu to +20dBu. (Nominal o/p level +4dBu)

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## **D227 Master Module**

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# D227 Master Module

## Auxiliaries

1 The auxiliary send master level controls set the output level of the auxiliary send mixes: the output level can be conveniently monitored using the aux send AFL switches. Optimum noise performance will be obtained with the send controls on the input channels turned up far enough to give a **peak** output level (metered using the aux send AFL switch) of +16 with the output level control at unity gain (7 on the scale). The output level should then be turned down to suit the input level of the device the send is driving.

## Master Outputs

Insert points are provided in the stereo mix signal path to enable the insertion of external processing devices in the signal path.

2 The master output faders control the level of the stereo mix output. In order to preserve headroom, they should normally be run in the top 10dB of their range. If the stereo output is feeding a device which requires a lower input level (e.g. a domestic tape recorder), the reference level of the output and 2-track return level should be changed using the internal switch: see the Delta DLX Technical Manual.

## Monitoring

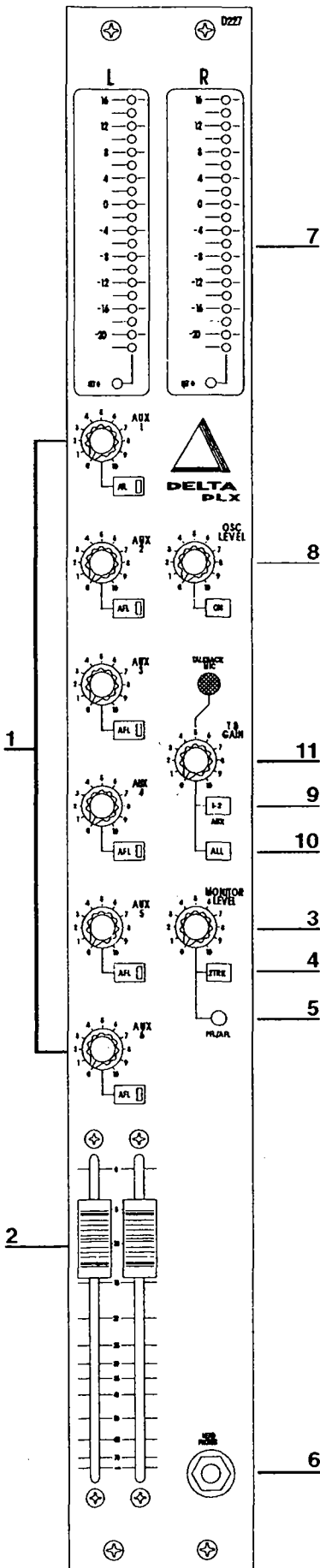
3 Provision is made to monitor the stereo mix output, the PFL signal and the 2 track return. The CR MON jacks on the C/Room Rear Connector panel are available to drive an external power amplifier/loudspeakers, alternatively stereo headphones can be plugged into the front panel jack (6), and this will mute the CR MON outputs. The level is set by the **MONITOR LEVEL** control.

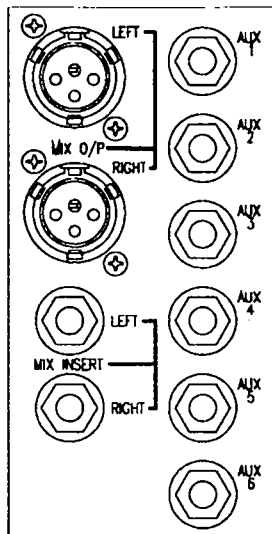
4 Selection of **2TRK** routes the 2 track return inputs to the monitors, replacing the mix signal.

5 The red **PFL/AFL** LED adjacent to the monitor control will light when any channel of group **PFL** or Aux master **AFL** switch is pressed to indicate the monitoring status. When active the monitor is automatically switched to the **PFL/AFL** signal, overriding the Mix/2 track selection. **PFL** signals from different sources will be summed.

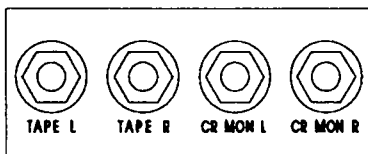
## Output Meters

7 The stereo output **METERS** automatically follow the monitor selection of Mix/2 track/ **PFL**, though the meter reading is independent of the **MONITOR LEVEL**. The meter reading is relative to the operating level selected (see 3 above).





**Module Rear Panel**



**Master Rear Connector Panel**

**Mix O/Ps Male XLR**

Pin 1	Screen
Pin 2	Hot
Pin 3	Cold

**Mon O/P, Aux O/Ps**

3 Pole Jacks

Tip	Hot
Ring	Ground Sense (cold)
Sleeve	Ground

**Mix Inserts 3 Pole Jack**

Tip	Return
Ring	Send
Sleeve	Ground

**CR Mon O/Ps 3 pole jack**

Tip	Hot
Ring	Ground Sense (cold)
Sleeve	Ground

**2TRK Tape 3 pole jack**

Tip	Hot
Ring	Cold
Sleeve	Ground

**Oscillator**

**8** A 1kHz oscillator is provided, which feeds a sine wave output of up to +16dBu to all groups, the stereo mix and aux busses at a level set by the **OSC LEVEL** control. The oscillator is enabled by the **ON** switch, and is overridden by the selection of the talkback switch.

**Talkback**

**9, 10, 11** Talkback can be routed to either Aux send 1 & 2 (9), or to all busses (10). An integral mic is provided, flush mounted behind the front panel, with an associated gain control **TB GAIN** (11). In order to avoid acoustic feedback, the CR monitor outputs are attenuated ("Dimmed") by approximately 20dB when any talkback switch is selected, and muted when talkback to **ALL** is selected.

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## Specification

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### **Auxiliary Send Outputs**

Unbalanced, ground compensated.

Nominal Level	+4dBu
Maximum output level	+21dBu into >600Ω
Output impedance	75Ω
Master gain control range	+10...-85 dB
Mix bus noise (36ch. frame)	<-80dBu
THD	0.003% at 1KHz 0.006% at 10KHz

### **Mix Output**

Electronically balanced.

Nominal output level	+4dBu/-10dBV.
Maximum output level	+26dBu into 600Ω
Output impedance	75Ω
THD	0.003% at 1KHz 0.006% at 10KHz
Mix fader off ratio	-80dBu @ 1kHz.
Bus residual noise	-92dBu.
Mix bus noise (36 channels routed, faders down)	-80dBu.

### **Insert point**

Unbalanced.

Nominal level	-2dBu.
Output capability	+20dBu into 2kΩ
Return impedance	10k Ω
Minimum load impedance	2k Ω

### **Phones Output**

Ground cancelling.

Phones Output capable of	150mW, and +20dBu into 600 Ω
Phones Output Impedance	50 Ω
Maximum level	0dBu into 8 Ω

### **Talkback**

Microphone	Internal Electret.
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### **2-Track Returns**

Nominal Level	+4dBu or -10dBV
Maximum Return Level	+21dB above nominal

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### **Oscillator**

Max level at group/mix O/P	+16dBu
Frequency	1kHz +/-10%
Distortion	<1% THD

### **Metering**

20 segment LED bargraph.	
Response	Peak or average reading
Rise time to -1db	150m sec, average 4m sec, peak
Decay time to -20dB	250m sec, average 1.2 sec, peak.
Accuracy relative to 0dB	+/-1dB.
Calibration range	0db = -2dBu to +20dBu. (Nominal o/p level +4dBu)

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# Appendices

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## **SPECIFICATION NOTES AND CONDITIONS**

**A** The console has a nominal output level of +4dBu: all input sensitivities are relative to this: i.e. with line input gain set to '0', an input of 0dBu, will give an output of +4dBu at any group or mix output and, a sensitivity of +4dBu gives unity gain from input to output.

**B** Noise measurements are taken with 22Hz-22kHz bandwidth, average reading response.

**C** Distortion measurements are made with an input of +20dBu (line inputs at unity gain) giving an output of +20dBu. The analyser reads THD+N with an average response, over a 10Hz-30kHz bandwidth.

**D** Frequency response and E.Q. measurements are made with an input of 0dBu to line inputs at unity gain, outputs are quoted relative to 0dBu.

**E** Crosstalk and rejection measurements are made with an input level of +20dBu (line inputs at unity gain) giving an output of +20dBu on the active signal path. The ratio quoted is relative to +20dBu output.

**F** Gain tolerance +/-1.5dB or 10% of indicated value, which ever is the greater.

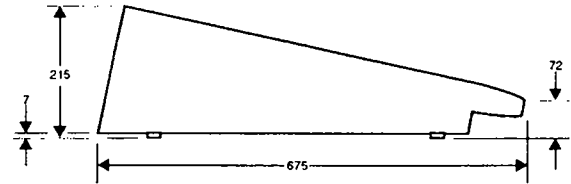
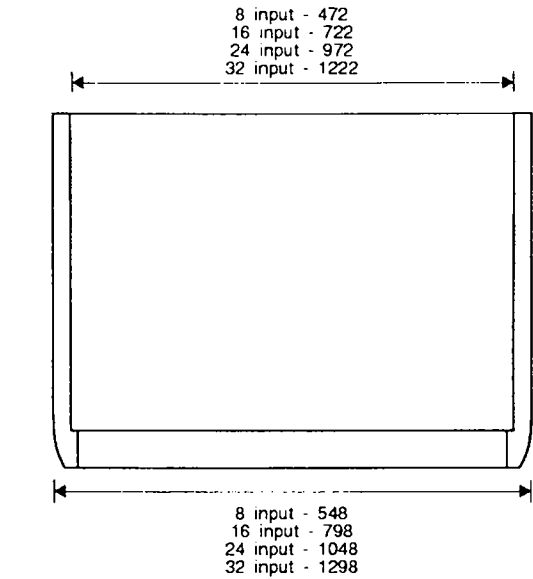
**G** All crosstalk and rejection figures stated with 16 channels routed to the measured output, where applicable.

**H** Mix noise figures are stated in two ways:

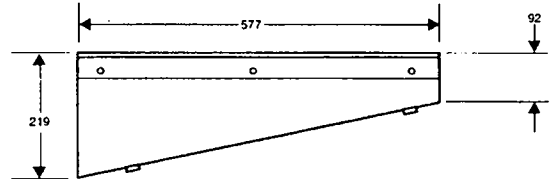
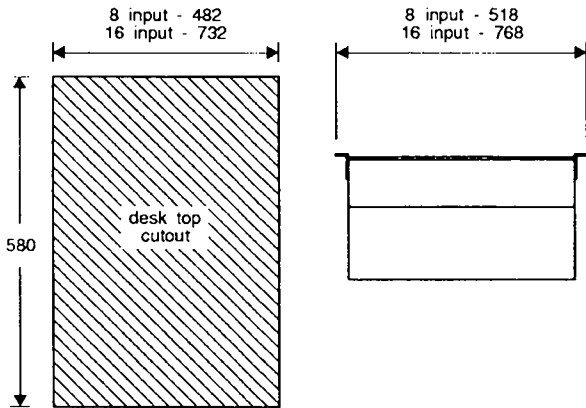
- Bus residual noise: Noise measured at the output with faders at unity and no channels routed.
- Mix bus noise: Noise measured at the output with 36 channels routed, faders down.

# Dimensions

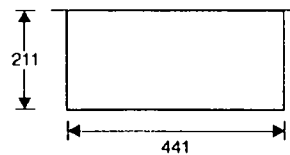
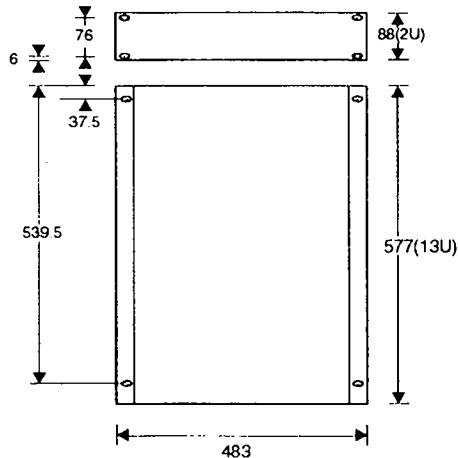
## Delta DLX Outline Dimensions



FREE STANDING CONSOLE



DESK TOP CONSOLE WITH FIXING BRACKETS



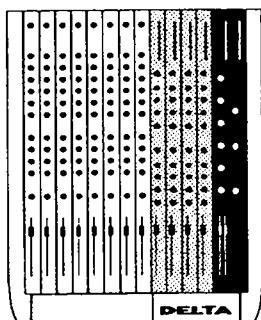
RACK MOUNT CONSOLE

All dimensions shown in millimetres (mm).

# Configurations

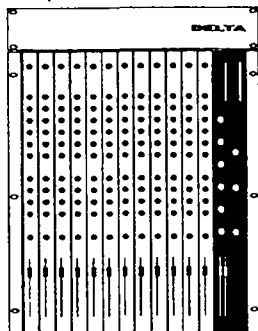
All 8 Input formats available as free standing or rackmount

8 Input Frame



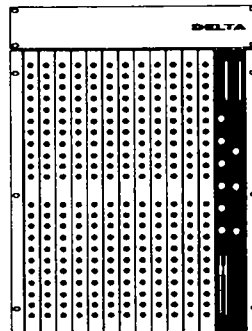
8:4:2

8 Input Rack Frame



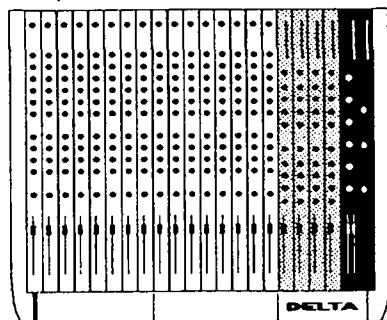
12:2 Rack

8 Input Rack Frame



24:2 Rack

16 Input Frame

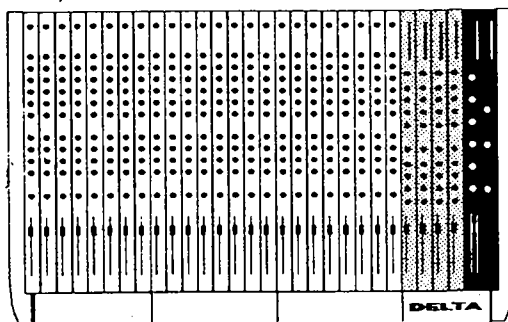


16:4:2

NOTES:

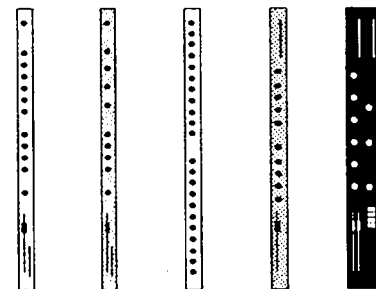
- The 8 & 16 Channel frames are also available with the side and front trim replaced with fixing brackets for flush fitting in a desk top.
- The Rack Frame requires 2U of blank space above for connector clearance.

24 Input Frame



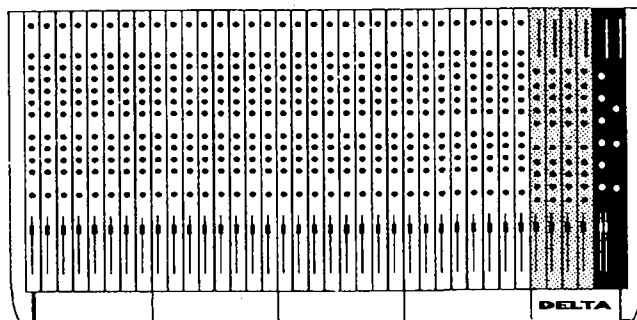
24:4:2

Key to Delta DLX Modules



Mono Input Stereo Input Dual Line Input Group Output Master Output

32 Input Frame



32:4:2

Above only shows the standard production configurations. There are few practical restrictions to the arrangement of modules of the types available. Please consult your dealer for advice on particular layouts.

# Warranty

- 1 **Soundcraft** means Soundcraft Electronics Ltd.

**End User** means the person who first puts the equipment into regular operation.

**Dealer** means the person other than Soundcraft (if any) from whom the End User purchased the Equipment, provided such a person is authorised for this purpose by Soundcraft or its accredited Distributor.

**Equipment** means the equipment supplied with this manual.

- 2 If within the period of twelve months from the date of delivery of the Equipment to the End User it shall prove defective by reason only of faulty materials and/or workmanship to such an extent that the effectiveness and/or usability thereof is materially affected the Equipment or the defective component should be returned to the Dealer or to Soundcraft and subject to the following conditions the Dealer or Soundcraft will repair or replace the defective components. Any components replaced will become the property of Soundcraft.
- 3 Any Equipment or component returned will be at the risk of the End User whilst in transit (both to and from the Dealer or Soundcraft) and postage must be prepaid.
- 4 This warranty shall only be available if:
  - a) the Equipment has been properly installed in accordance with instructions contained in Soundcraft's manual; and
  - b) the End User has notified Soundcraft or the Dealer within 14 days of the defect appearing; and
  - c) no persons other than authorised representatives of Soundcraft or the Dealer have effected any replacement of parts maintenance adjustments or repairs to the Equipment; and
  - d) the End User has used the Equipment only for such purposes as Soundcraft recommends, with only such operating supplies as meet Soundcraft's specifications and otherwise in all respects in accordance Soundcraft's recommendations.
- 5 Defects arising as a result of the following are not covered by this Warranty: faulty or negligent handling, chemical or electro-chemical or electrical influences, accidental damage, Acts of God, neglect, deficiency in electrical power, air-conditioning or humidity control.
- 6 The benefit of this Warranty may not be assigned by the End User.
- 7 End Users who are consumers should note their rights under this Warranty are in addition to and do not affect any other rights to which they may be entitled against the seller of the Equipment.

# Glossary

<b>auxiliary send</b>	an output from the console comprising a mix of signals from channels and groups derived independently of the main stereo group mixes. Typically the feeds to the mix are implemented on rotary level controls.
<b>balance</b>	the relative levels of the left and right channels of a stereo signal.
<b>clipping</b>	the onset of severe distortion in the signal path, usually caused by the peak signal voltage being limited by the circuit's power supply voltage.
<b>CR (control room) monitors</b>	loudspeakers used by the operator (engineer) in the control room to listen to the mix.
<b>dB (decibel)</b>	a ratio of two voltages or signal levels, expressed by the equation $dB=20\text{Log}_{10}(V1/V2)$ . Adding the suffix 'u' denotes the ratio is relative to 0.775V RMS.
<b>DI(direct injection)</b>	the practice of connecting an electric musical instrument directly to the input of the mixing console, rather than to an amplifier and loudspeaker which is covered by a microphone feeding the console.
<b>equaliser</b>	a device that allows the boosting or cutting of selected bands of frequencies in the signal path.
<b>foldback</b>	a feed sent back to the artistes via loudspeakers or headphones to enable them to monitor the sounds they are producing.
<b>frequency response</b>	the variation in gain of a device with frequency.
<b>(sub) group</b>	an output into which a group of signals can be mixed.
<b>headroom</b>	the available signal range above the nominal level before clipping occurs.
<b>highpass filter</b>	a filter that rejects low frequencies.
<b>line level signals signals</b>	at a nominal level of -10 to +6dBu, coming from a low impedance source.
<b>pan (pot)</b>	abbreviation of 'panorama': controls levels sent to left and right outputs.
<b>peaking</b>	an equaliser response curve affecting only a band of frequencies i.e. based on a bandpass response.
<b>PFL (pre-fade listen)</b>	a function that allows the operator to monitor the pre-fade signal in a channel independently of the main mix.
<b>rolloff</b>	a fall in gain at the extremes of the frequency response.
<b>shelving</b>	an equaliser response affecting all frequencies above or below the break frequency i.e. a highpass or lowpass derived response.
<b>spill</b>	acoustic interference from other sources.
<b>talkback</b>	the operator speaking to the artistes or to tape via the auxiliary or group outputs.
<b>transient</b>	a momentary rise in the signal level.





Harman International Industries Ltd., Cranborne House, Cranborne Road, Potters Bar, Hertfordshire, EN6 3JN, U.K.  
Tel: +44 (0) 1707 665000 Fax: +44 (0) 1707 660482

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