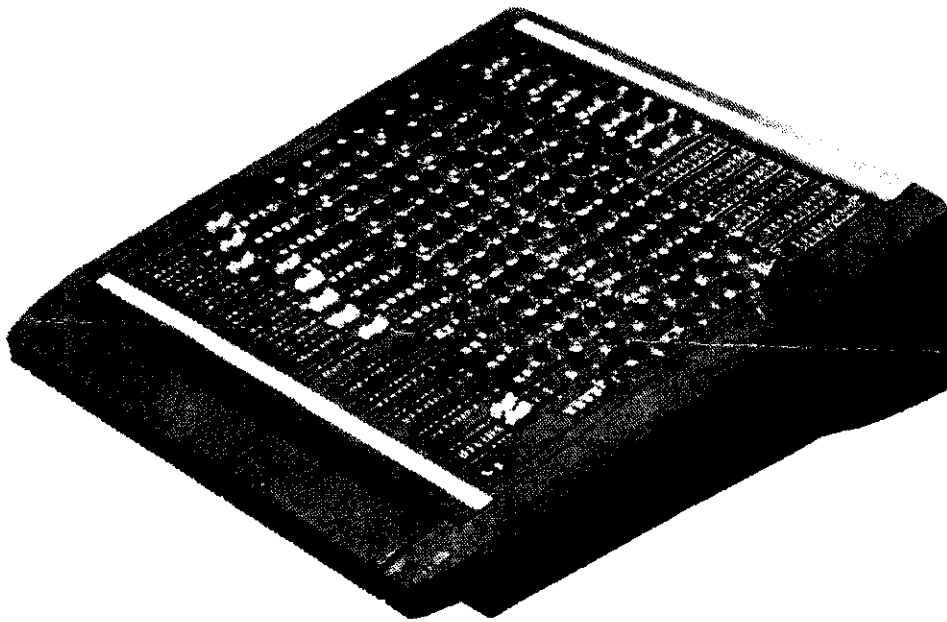


# USER GUIDE



Soundcraft



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**SOUNDCRAFT**



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*USER GUIDE*

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

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Issue 1

Part No. ZZ2679

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# Introduction to Delta AVE

Delta AVE is a development of the 200 Delta console, tailored specifically to the needs of video post production.

Designed for audio-follow-video applications, Delta AVE includes a VCA in each input channel which enables the signal level to be controlled externally by an edit controller, producing audio crossfades in synchronisation with video transitions or at other precisely controlled cue points.

Delta AVE is compatible with most popular edit controllers, either by direct connection to a parallel interface, or via industry-standard serial communications with the optional Soundcraft VSA24II interface. This latter option supports the four main communications protocols - GVG100, ESAM 1, ESAM II, and AMX 100.

*The Delta AVE is based on single piece steel frame for superb rigidity, combined with a choice of modules with integral rear connectors, allowing the console to be configured for a wide range of applications. Delta AVE is available in 8, 16 or 24 channel free-standing consoles, 8 or 16 channel desktop mounting consoles or as an 8 channel rack-mounting console. All frames require a master module, and any Group modules fitted have to be positioned immediately to the left of this.*

Stereo AVE consoles can accept a mix of mono or stereo AVE input modules as required, while Mono consoles will only accept mono AVE input modules. All consoles may be fitted with a choice of Delta Standard, Deluxe, Stereo or Dual Line input modules if VCA control is not required, in addition to AVE input modules.

**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 Comprehensive Master module includes a 2-track tape return for monitoring the output of the master video machine, and outputs for control room monitor loudspeakers. Illuminated switches on the master module provide control of monitor status and a means of locally bypassing the external control signals.

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 input. All AVE inputs have VCA control (one for the Mono input, two for the Stereo input) which provide external control of channel signal level, and a short-throw 'depth' fader adjacent to the main channel fader which sets a minimum fade-out level for the channel to facilitate background effects.

# Precautions and Safety Instructions

---

## **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.

---

## **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.

---

## **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.

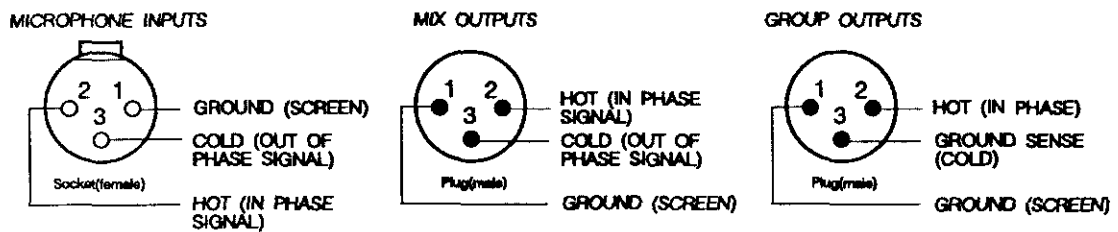
**Warning!** Always switch the power supply off before connecting or disconnecting the console power cable, removing or installing modules, and servicing. In the event of an electrical storm, or large mains voltage fluctuations, immediately switch off the PSU and unplug from the mains.

Always ensure that that you use the correct power supply for your console. A CPS150 unit is required for 8 channel consoles, and a CPS450 is required for 16 and 24 channel consoles.

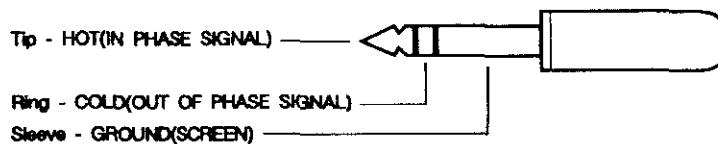
# Connections

## Wiring Conventions

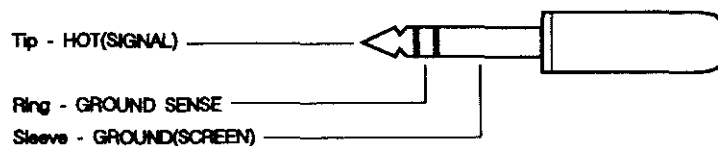
The Delta AVE console uses two different types of audio connector, 3 pin XLR (top diagram) and 1/4" three pole (A gauge or stereo) jacks. The latter are used in four different configurations, as shown below. The rear frame of the console has standard apertures fitted with blanking panels. Your Soundcraft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



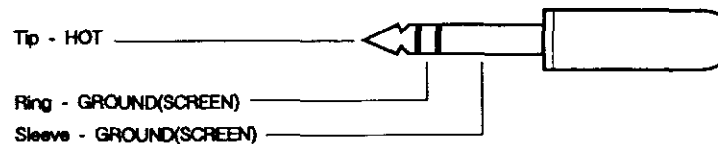
1/4" 'A' Gauge Stereo Jack Plug used as balanced input: line inputs and tape returns



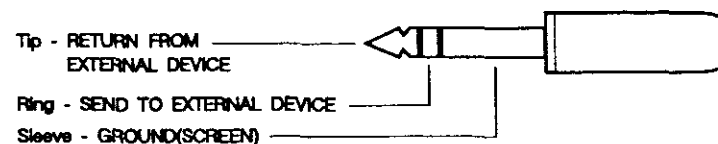
1/4" 'A' Gauge Stereo Jack Plug used as ground compensated output: auxiliary send outputs and control room monitor outputs



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



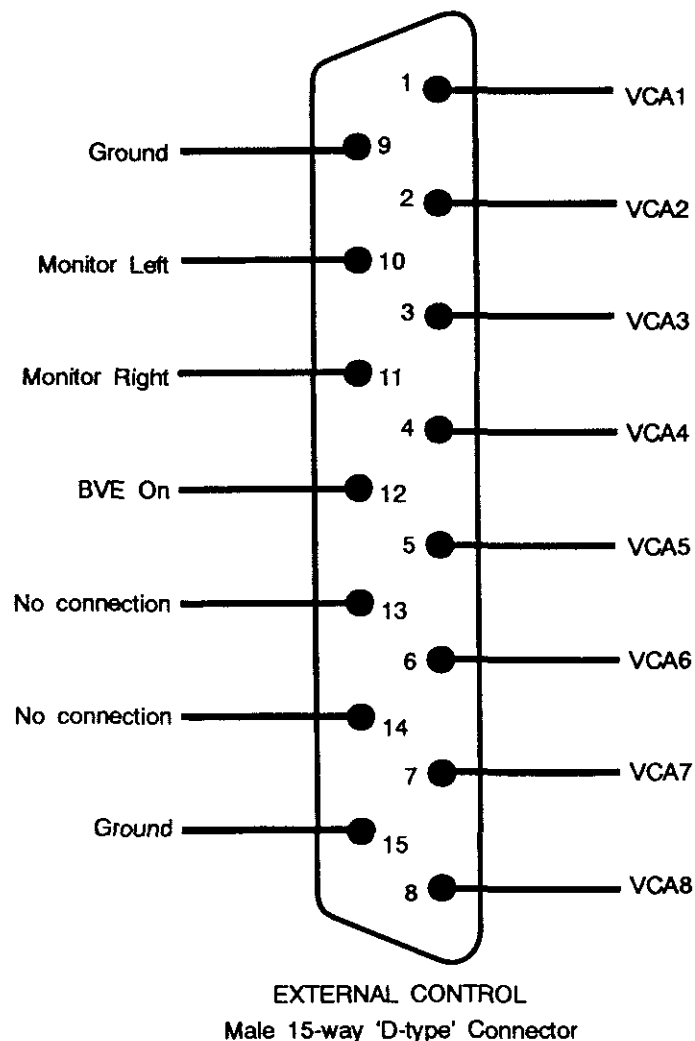
## External Interface

The interface to an external edit controller is via a 15 way D-type male connector which carries 8 VCA control and logic status lines. This interface is suitable for direct connection to appropriate edit controller parallel ports, or for connection to the Soundcraft VSA 24II which provides compatibility with most edit controller serial ports. Consult you dealer for guidance on interfacing to specific editing systems.

### NOTE:

One external interface connector is fitted for each 8 AVE inputs installed in the console. 16 channel consoles will therefore be fitted with 2 connectors, and 24 channel consoles with 3 connectors. The logic status lines are only used on one of the connectors in each console, and this is always on the panel nearest to the Master module - i.e. 1-8 on 8 channel console, 9-16 on 16 channel console and 17-24 on 24 channel console. It is important to check that these logic status signals will be available on the appropriate connector on the edit controller, and it may be necessary to make up a 'Y' lead in certain cases. Only the VCA control lines need be connected on the remaining sockets.

The connectors are provided with screw locking, and we recommend that you only use appropriate mating sockets. Suitable connectors are supplied with the console.





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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 AVE 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 AVE 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 power supply for your console. A CPS150 unit is required for 8 channel consoles, and a CPS450 is required for 16 and 24 channel consoles.

---

## ***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.

## Examples of Use

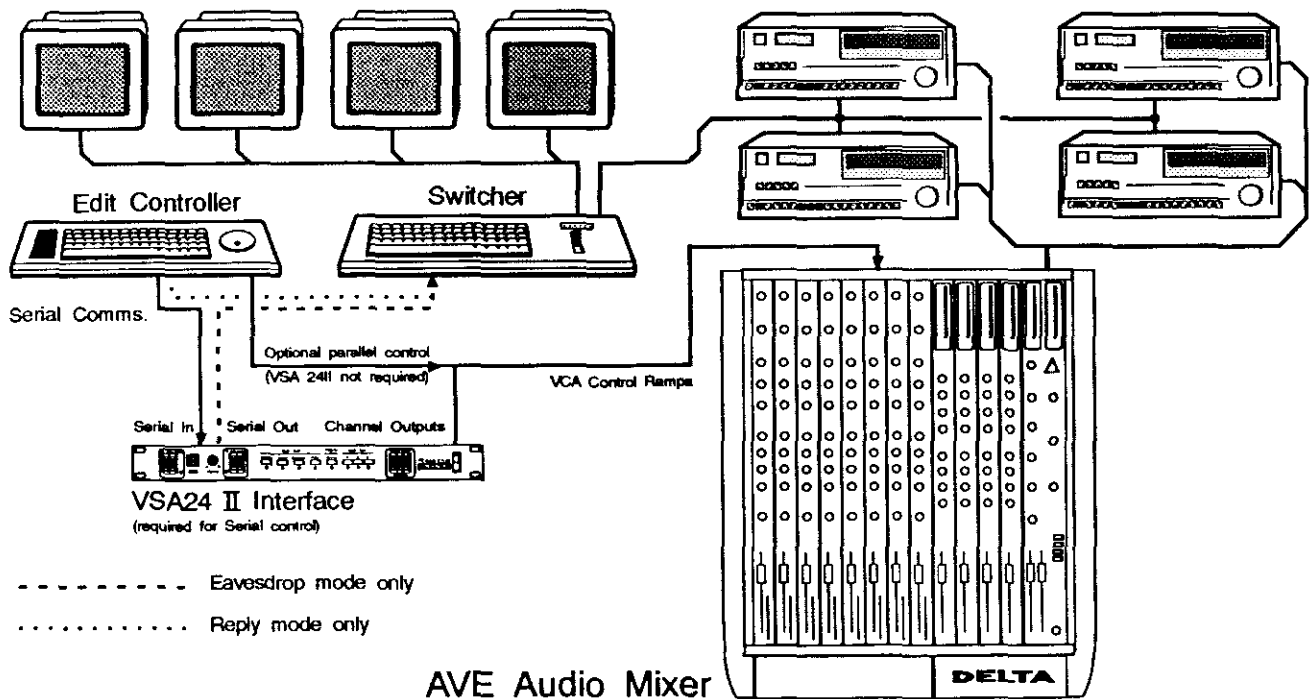
The diagram below shows a typical video editing system incorporating the Delta AVE as the audio mixer. The unique flexibility of the Delta AVE allows the console to be easily reconfigured to suit your particular requirements, and this is therefore only an indication of the possible applications.

The diagram shows an application of the Delta AVE in a typical edit suite configuration, and demonstrates the two different modes of serial communication, reply and eavesdrop, using the Soundcraft VSA24II serial interface. The Delta AVE may alternatively be connected directly via a parallel link if a suitable port is available on your edit controller, and the VSA24II is therefore not required.

In Reply mode the VSA24II is connected to a serial port on the edit controller via the serial in connector. The video switcher is connected to the edit controller via a separate port on the edit controller. The edit controller sends separate commands to the video switcher and the VSA24II and expects separate acknowledgements back from the two units.

In eavesdrop mode the VSA24II is connected between the video switcher and the edit controller, which only sends out one set of commands. Both units respond to these commands to give audio-follow-video crossfades, although only the switcher sends replies back to the edit controller.

Audio outputs from the video machines, and any other sources are connected to the Delta AVE inputs. Mixer outputs are fed to the inputs on the master video recorder, and the outputs from this machine may be monitored by connection back to the 2-track return on the Delta AVE.



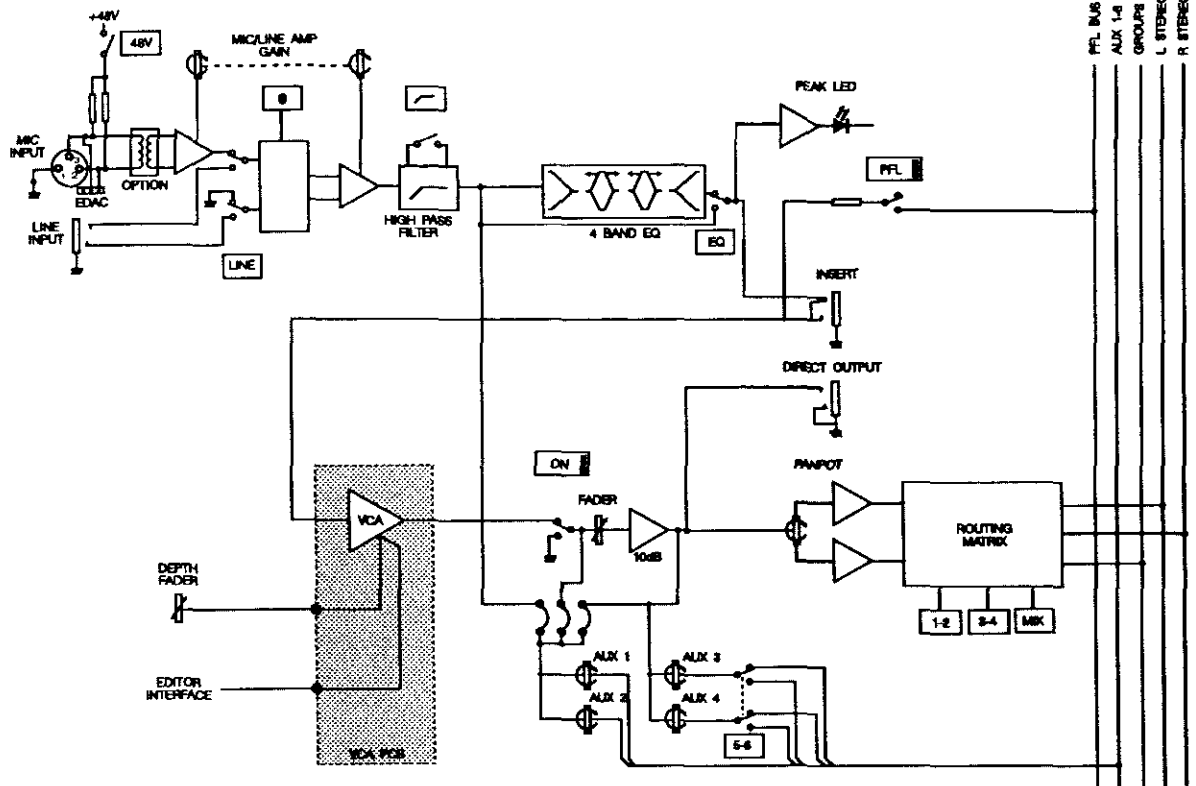


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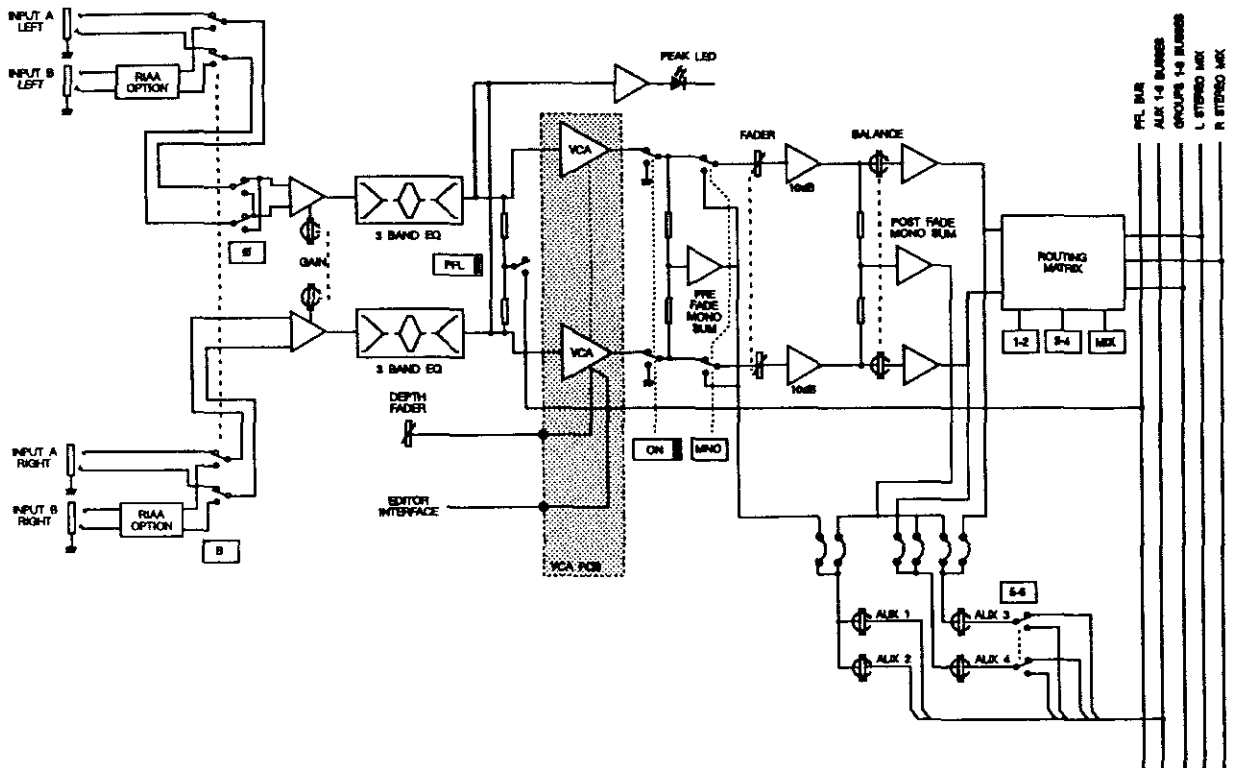
# Module Block Diagrams

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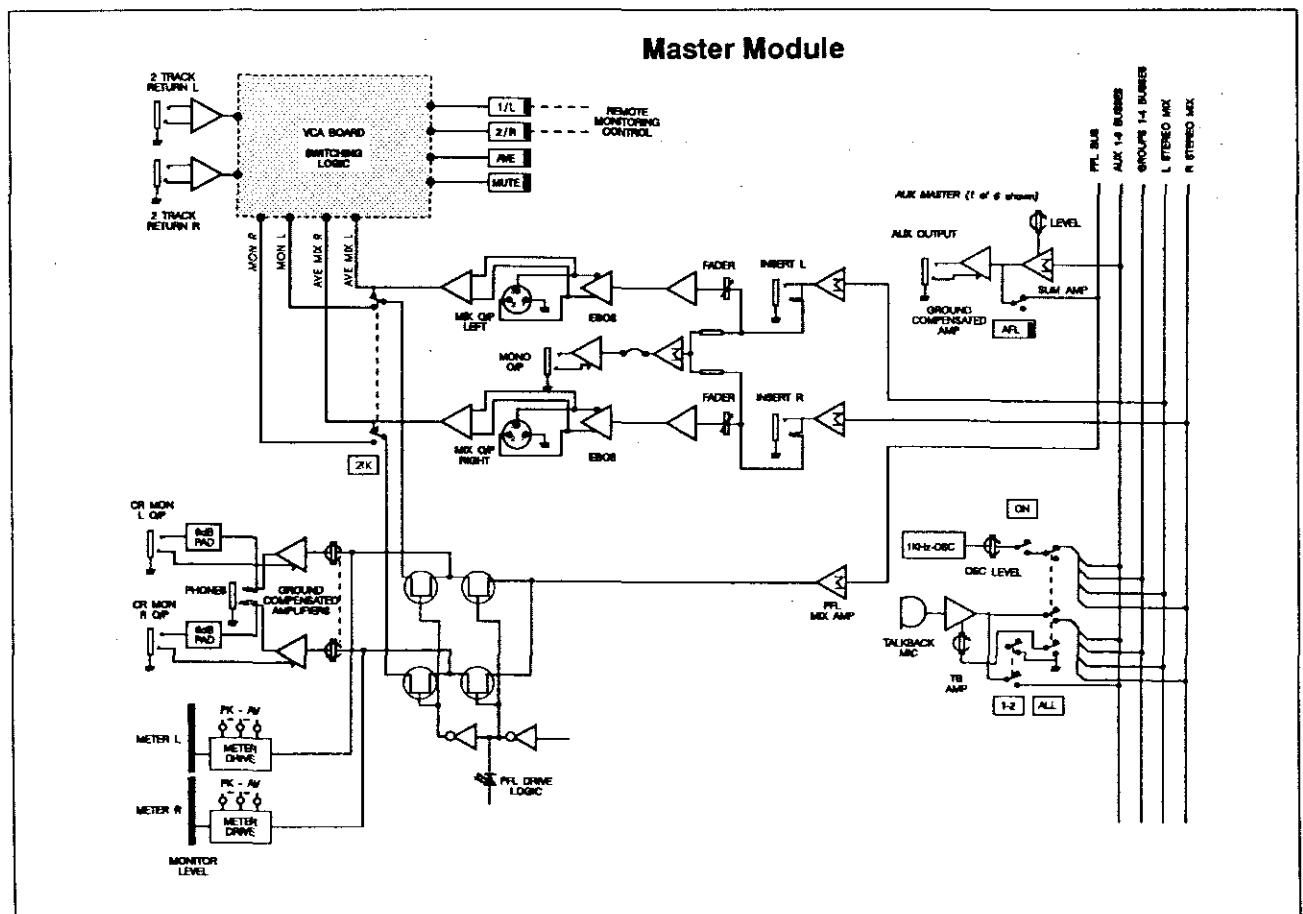
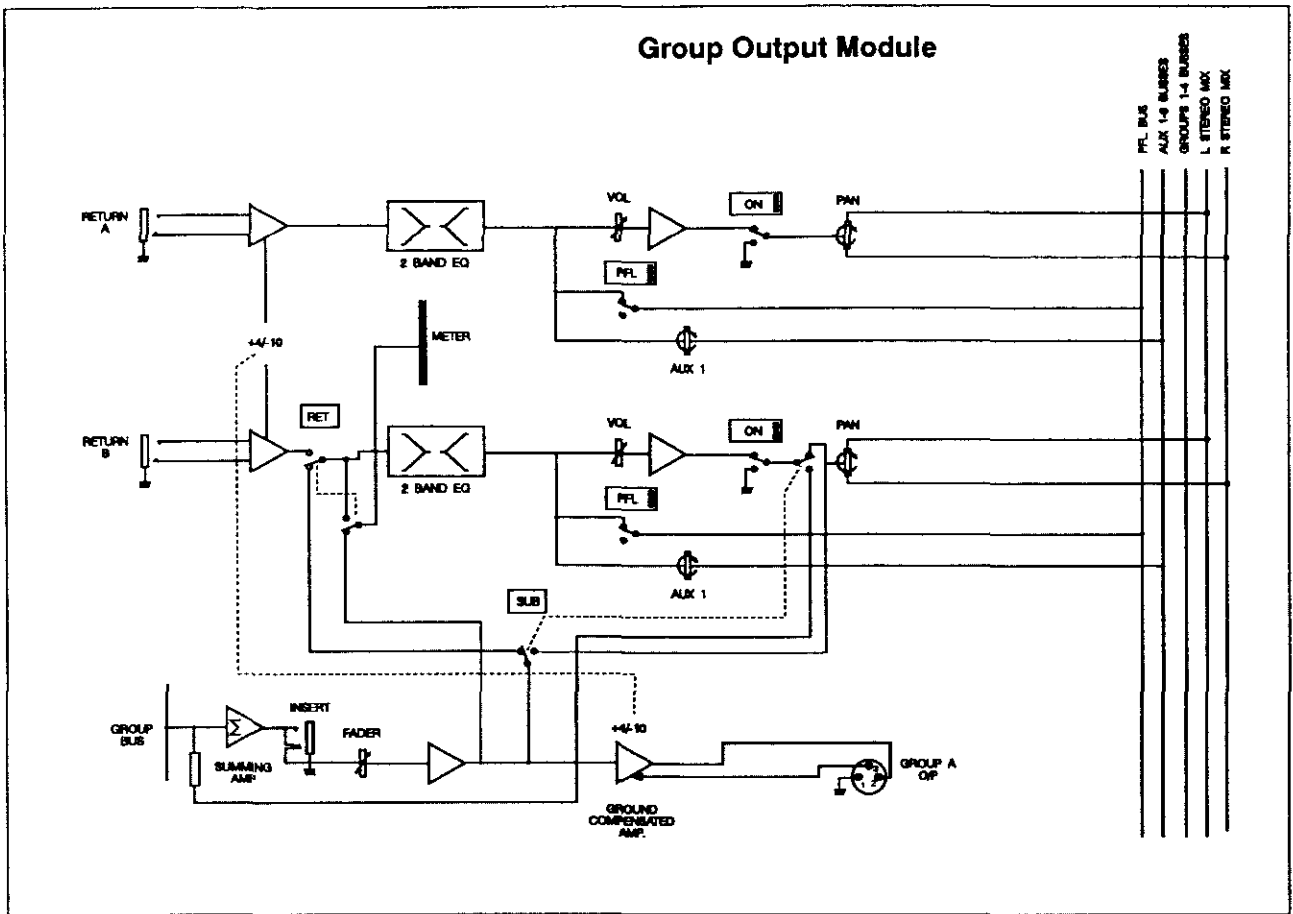
### Mono Input Module



### Stereo Input Module







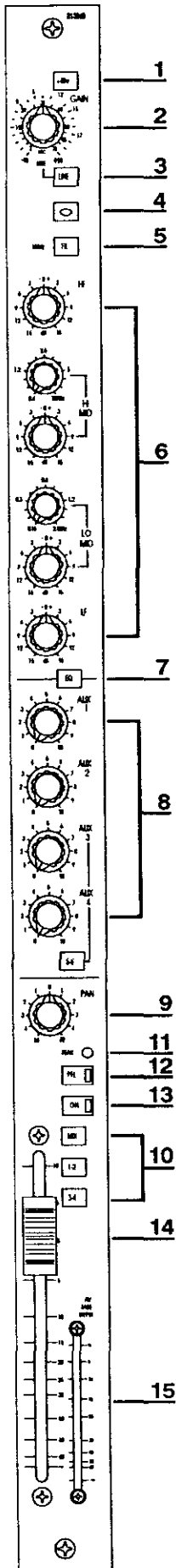


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# **D221 Mono AVE Input Module**

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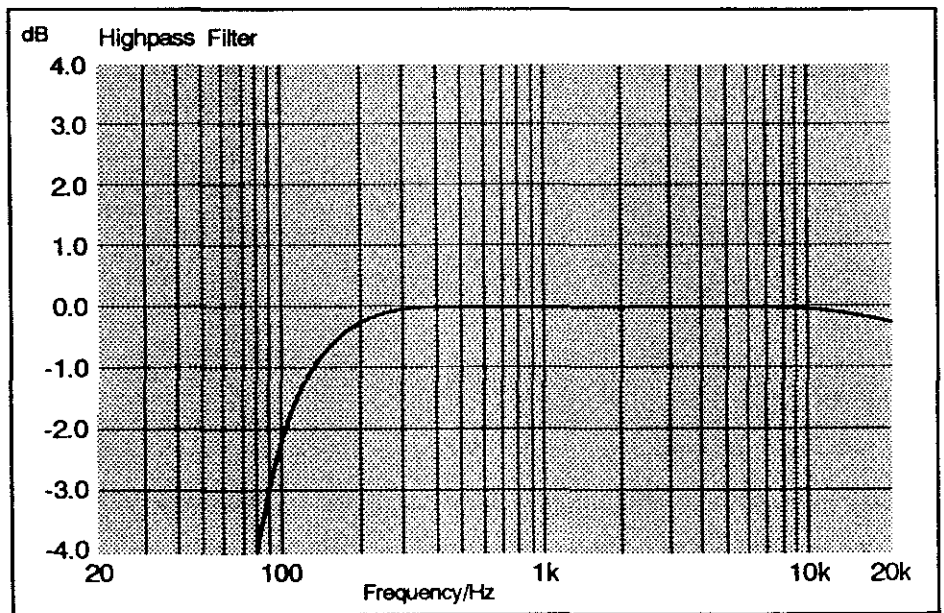
# D221 Mono AVE Input Module



## 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

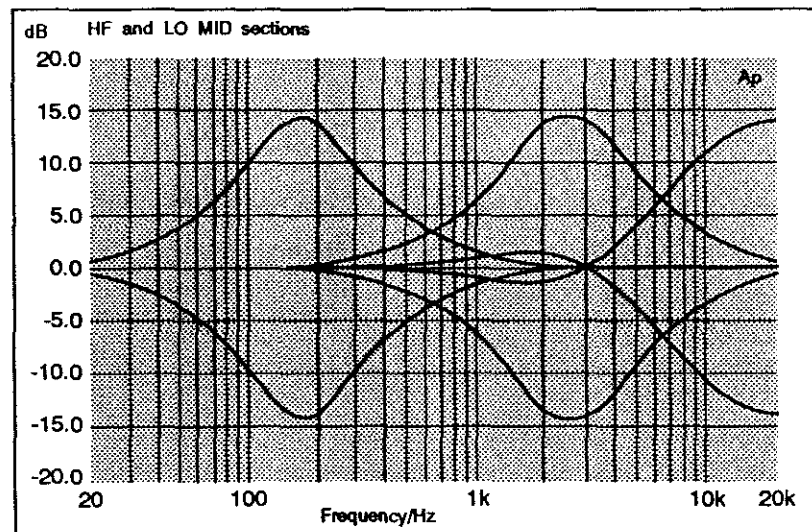
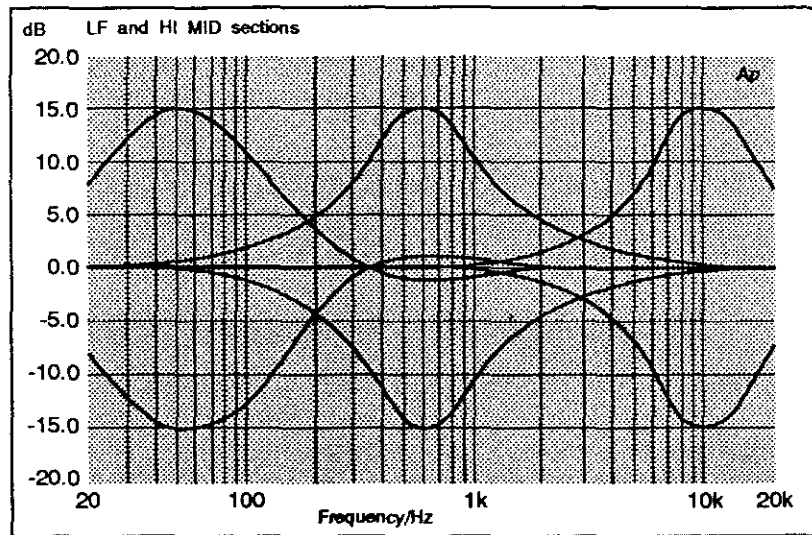


## Equaliser

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 pots are centre detented, the centre position giving a flat response.

7 EQ switches the equaliser into the signal path when pressed.

## Frequency Response Curves of the Equaliser



### Auxiliaries

**8** Four Auxiliary Sends are provided: **AUX 1** and **AUX 2** are factory fitted with a link selecting a post EQ, pre fader signal. This can be changed to either a pre EQ, pre fade, or post fade signal if desired by altering internal jumpers: see the *Delta Technical Manual* for details. **AUX 3** and **AUX 4** are fed post EQ, post fader, hence their level follows the channel output level set by the fader. The output from these two controls can be routed to Aux sends 5 and 6 instead of 3 and 4, by using the 5-6 switch.

### Routing

**9** **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.

**10** 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

**11** 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.

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

**13** 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.

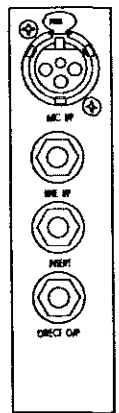
**14** The fader is a 100mm Alps type, with 10dB gain, and this is the main level control of the channel, with a long throw to enable rapid and accurate control of the channel output level. When mixing, you will get optimum headroom and signal-to-noise ratios by keeping the fader at about the unity gain (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.

**15** The AV FADE DEPTH fader sets the maximum amount of attenuation when the VCA is faded down under the external control of a video edit controller. This allows partial fades to be performed, for instance to leave outdoor sounds in the background when cutting from outside to inside a room. When the fader is in the fully down position the VCA responds to the full control range from fully ON to OFF.

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 the external interface connectors as shown on the left.



REAR CONNECTOR PANEL

#### 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 |

---

# Specification

---

## **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.<br>HI MID 0.6 - 10kHz peaking, Q=1.5<br>LO MID 0.15 - 2.5kHz peaking, Q=1.5<br>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 600R.                             |
| ON switch "off" ratio  | >100dB @ 1kHz, > 90dB @ 10kHz                 |
| Fader off ratio        | >85dB @ 1kHz, >80dB @ 10kHz<br>Reference 0dB. |
| Panpot crosstalk       | <-85dB @ 1kHz, 80dB @ 10kHz.                  |
| Routing off ratio      | 1kHz >95dB; 10kHz >90dB                       |
| Aux send off-ratio     | >80dB @ 10kHz, >85dB @ 1kHz.                  |



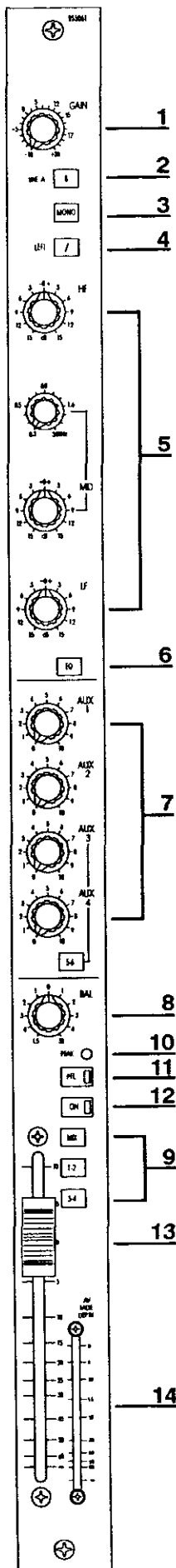


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## **D222 Stereo AVE Input Module**

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# D222 Stereo AVE 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, to enable the direct connection of magnetic phono cartridges to the console.
- 3 The **MONO** switch sums Left and Right inputs and feeds the channel with the resultant mono signal. The **BAL** control will then act as a pan control.
- 4 **Ø LEFT** reverses the phase of the left channel of the selected input.

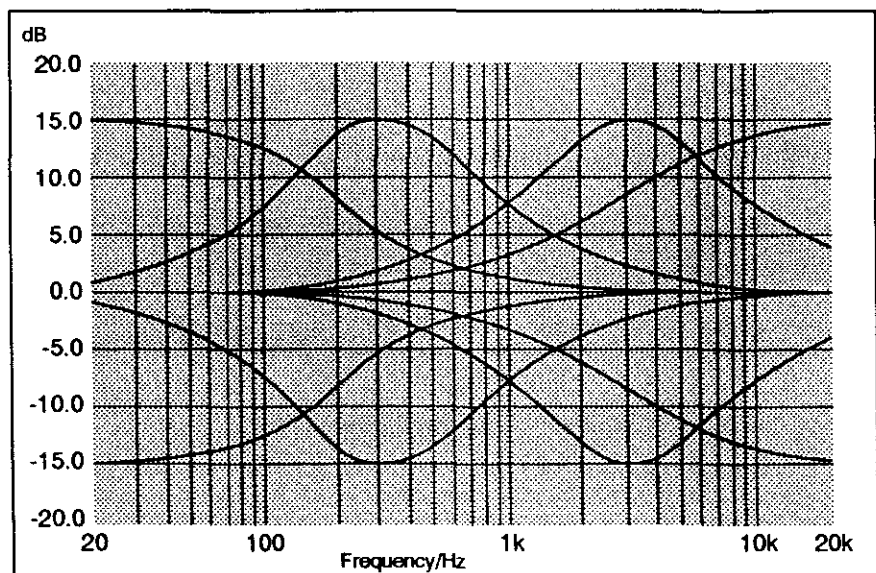
## Equaliser

- 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 pots are centre detented, the centre position giving a flat response.
- 6 EQ switches the equaliser into the signal path when pressed.

## Auxiliaries

- 7 Four Auxiliary sends are provided: **AUX 1** and **AUX 2** are factory linked to be fed from a post EQ, prefade mono sum signal, which can be changed to a post EQ post fade mono signal if desired: see the Delta Technical Manual for details. **AUX 3** and **AUX 4** are factory linked to be fed from a post EQ, post fade mono sum, but this can be changed so that the left channel feeds Aux 3 (Aux 5), and the right channel feeds Aux 4 (Aux 6). Their output is normally routed to Aux Sends 3 and 4, but can be changed to Aux Sends 5 and 6 by the 5-6 switch.

## Frequency Response of the Equaliser



## Routing

**8** 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. **BAL** acts as a pan control when **MONO** is selected.

**9** Three routing switches give access in pairs to **MIX** left and right busses and group busses **1-2** and **3-4**. It is recommended that the routing switches are deselected on any unused channels to maximise the audio performance of the console.

## Channel Status

**10** 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. If this lights any more than momentarily on transients in the signal, the input **GAIN** should be reduced.

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

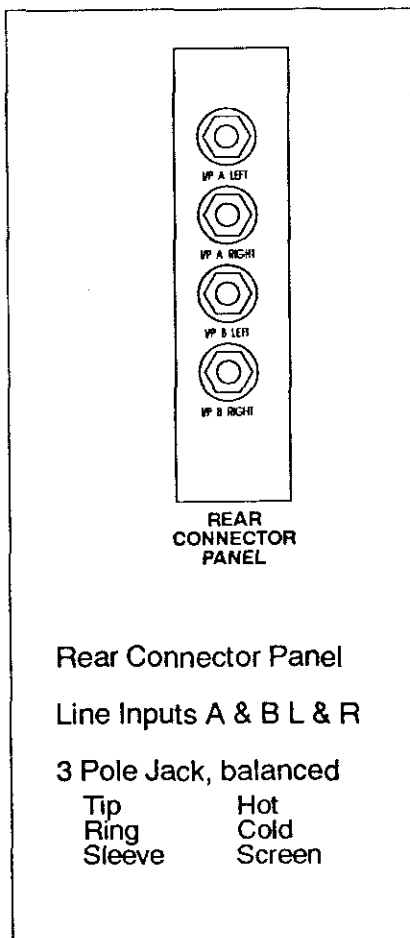
**12** The illuminated **ON** switch enables the post EQ signal path: when off, all auxiliary sends and L/R outputs are muted. We recommend that you switch any unused channels 'off', to prevent unwanted noise being added to any parts of the mix.

**13** The **FADER** is a stereo 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 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.

**14** The **AV FADE DEPTH** fader sets the maximum amount of attenuation when the VCA is faded down under the external control of a video edit controller. This allows partial fades to be performed, for instance to leave outdoor sounds in the background when cutting from outside to inside a room. When the fader is in the fully down position the VCA responds to the full control range from fully ON to OFF.

The inputs are electronically balanced. Transformer input balancing is not available on this module.

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



---

## Specification

---

### ***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<br>MF 0.3 - 3kHz peaking, Q=1<br>LF 60Hz shelving |

### ***General***

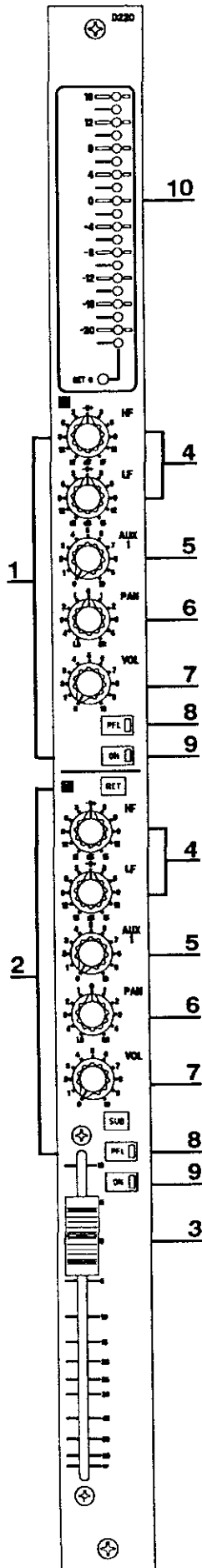
|   |                                 |
|---|---------------------------------|
| ON switch off ratio                       | >95dB @ 1kHz, >90dB @ 10kHz     |
| Fader off ratio                           | >85dB @ 1kHz, >80dB @ 10kHz     |
| Balance pot off ratio                     | <-85dB @ 1kHz,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

---

## **D220 Group Output Module**

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# D220 Group Output module



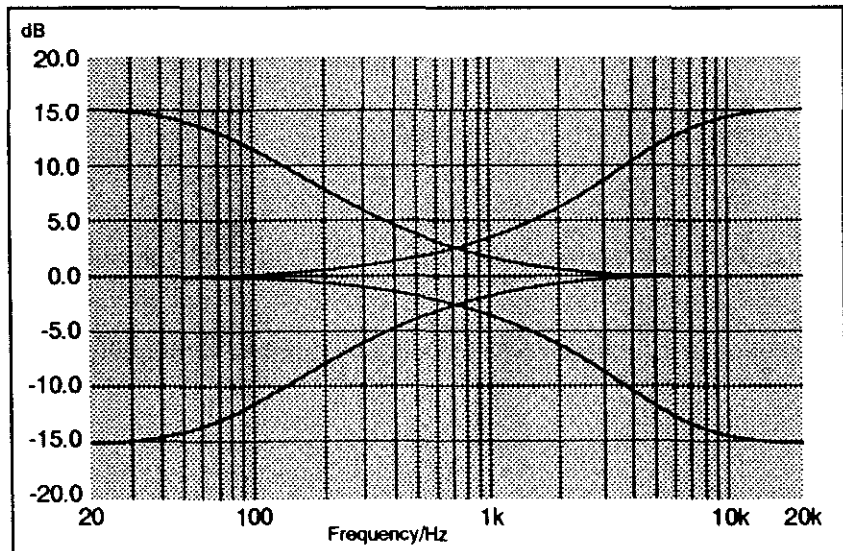
## Return

- 1 Upper return: this input feeds an external input signal onto 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. It feeds the stereo mix buss. The LED bargraph meter (10) follows the lower return source selection, and is link selectable for peak or average ballistics: see the Delta technical manual for details. 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. This allows effect return signals to be fader controlled and a set of grouped channels to be controlled by the same fader without using up valuable input modules. The diagram on the next page shows how **SUB** and **RET** affect the signal path.

## 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

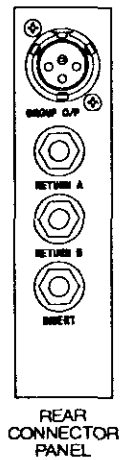


## Auxiliary

- 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

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 |

Channel 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 technical manual for details.

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

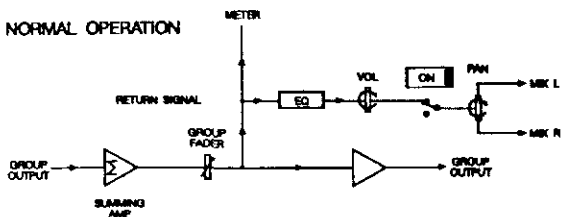
8 The red illuminated PFL switch feeds the post EQ, pre fader signal to the CR monitor outputs (or headphones jack), via the CR Monitor level control, replacing the signal currently feeding those outputs. The red PFL LED adjacent to the monitor control on the master module will light to indicate the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

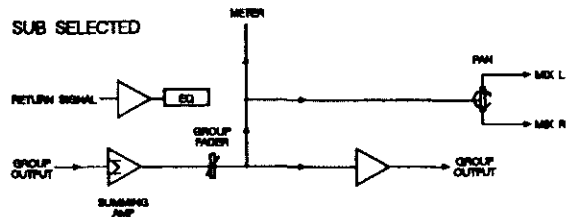
The rear connector panel is integral to the module and houses the four external interface connectors as shown on the left.

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

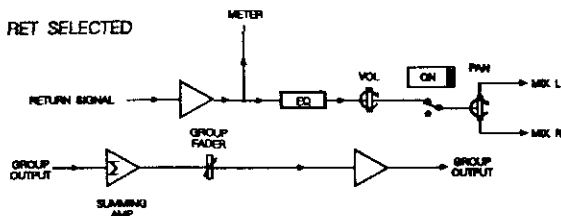
NORMAL OPERATION



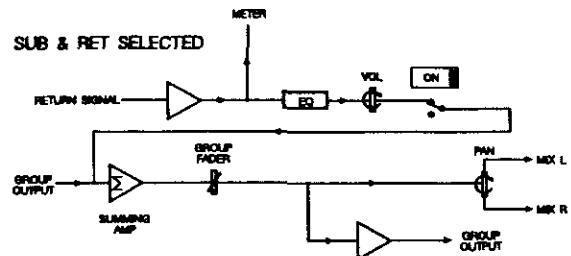
SUB SELECTED



RET SELECTED



SUB & RET SELECTED



---

## Specification

---

### **Group Output**

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

### **Group Insert**

|                         |                    |
|-------------------------|--------------------|
| Insert send level       | -2dBu, unbalanced. |
| Insert send max. O/P    | +20dBu into 2kΩ    |
| Insert return impedance | 10kΩ               |

### **Tape/Effects return**

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

### **Equalisation**

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

### **Metering**

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



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# **D223 AVE Master Module**

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# D223 AVE 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 technical manual.

## Monitoring

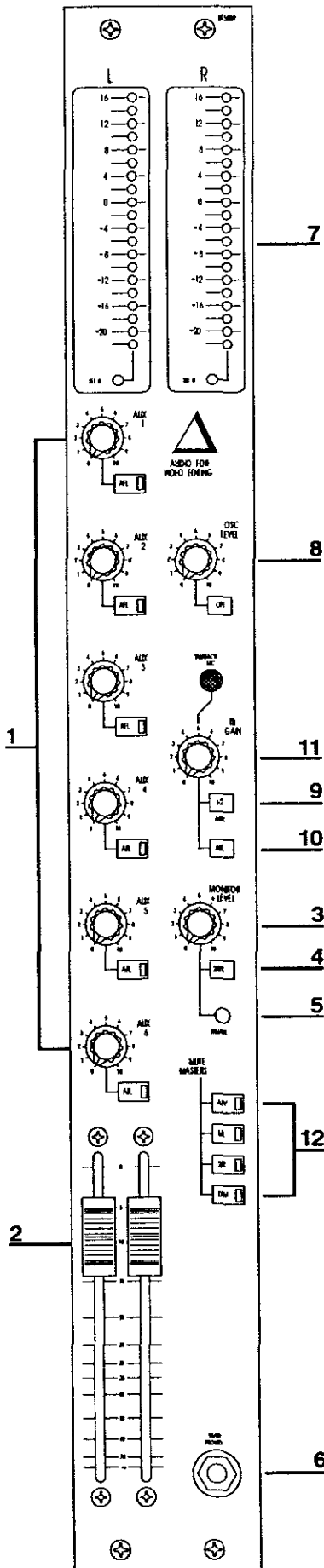
3 Provision is made to monitor the stereo mix output, the PFL signal and the 2 track return. The CR MON jacks on the C/Room Rear Connector panel are available to drive an external power amplifier/loudspeakers, alternatively stereo headphones can be plugged into the front panel jack (6), and this will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

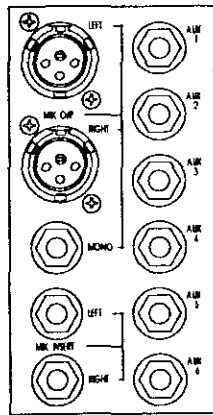
4 Selection of 2TRK routes the 2 track return inputs to the monitors, replacing the mix signal.

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.

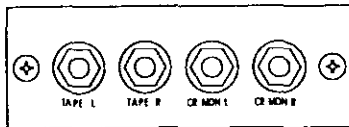
## Output Meters

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

**C/Room O/Ps 3 Pole Jacks**

Tip Hot  
 Ring Ground Sense (cold)  
 Sleeve Ground

**2-Track Tape Returns**

**3 Pole Jacks**

Tip Hot  
 Ring Cold  
 Sleeve Ground

**Multitrack Tape Returns**

**3 Pole Jacks**

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.

**AVE Masters**

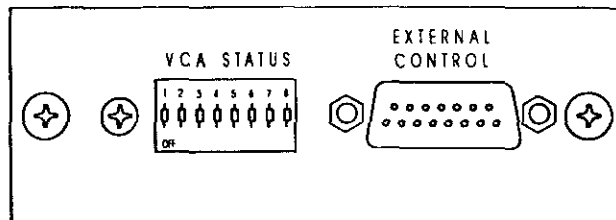
**12** Four illuminated master switches indicate the current control status - whether under local or external control.

Pressing **AVE** globally bypasses the VCA system (LED not illuminated), or when lit indicates that the VCAs are externally controllable by the presence of an edit controller connected to the edit controller interface (see below).

The **1/L** button swaps the left monitor output from **MIX L** to the 2-track return L. The control can be activated by pressing, or by a remote external control signal and is not affected by the status of the **AVE** switch. The **2/R** button operates in the same way for the right-hand signal path. Neither of these modes is affected by **AVE** status.

The illuminated **DIM** switch dims the left and right monitor outputs, and this can be activated by pressing or by remote external control. **DIM** is not affected by the **AVE** status.

The Edit Controller Interface connector panel (or panels on 16 and 24 channel consoles) carries the 15-way connector (**EXTERNAL CONTROL**) for direct connection to the parallel port on some edit controllers, or to the Soundcraft VSA 24II serial interface. An 8-way DIL switch (**VCA STATUS**) is also provided which enables any VCA channel to be deselected from external control (switch OFF). Any deselected VCAs are set to unity gain, and the channel therefore operates under local fader control. Please refer to page 4 for connector pinout details.



EDIT CONTROLLER INTERFACE REAR CONNECTOR PANEL

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# Specification

---

## ***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                           |
| Aux - Aux crosstalk (all but one fed signal) | <-80dBu at 1KHz                   |
| THD  | 0.003% at 1KHz<br>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<br>0.006% at 10KHz |
| Mix fader off ratio                                | -80dBu @ 1kHz.                    |
| Bus residual noise                                 | -92dBu.                           |
| Mix bus noise<br>(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, Main and Alt Outputs***

Ground cancelling.

|                         |                                 |
|-------------------------|---------------------------------|
| Phones o/p capable of   | 150mW, and<br>+20dBu into 600 Ω |
| Phones Output Impedance | 50 Ω                            |
| Maximum level           | 0dBu into 8 Ω                   |

## ***Talkback***

|            |                    |
|------------|--------------------|
| Microphone | Internal Electret. |
|------------|--------------------|

## ***2-Track Returns***

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

---

### **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<br>4m sec, peak                   |
| Decay time to -20dB      | 250m sec, average<br>1.2 sec, peak.                 |
| Accuracy relative to 0dB | +/-1dB.   |
| Calibration range        | 0db = -2dBu to +20dBu.<br>(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.

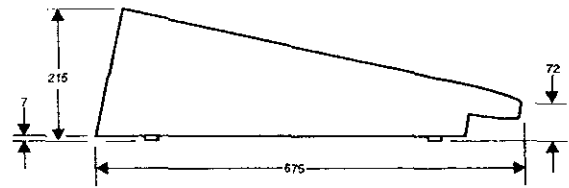
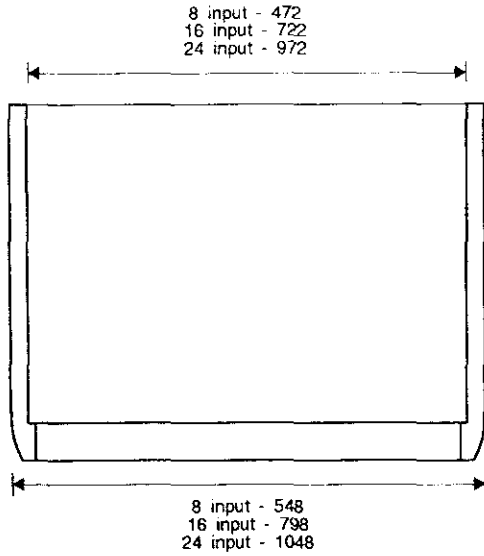
**H** Mix noise figures are stated in two ways:

- **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.

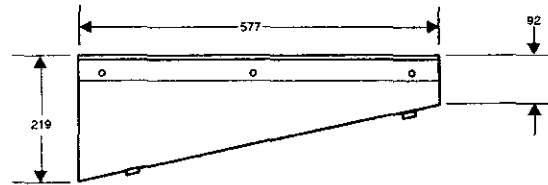
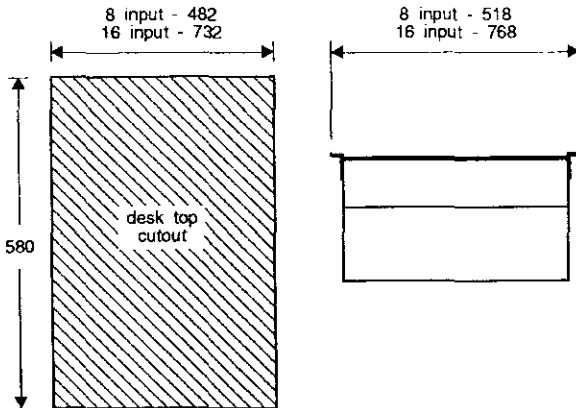


# Dimensions

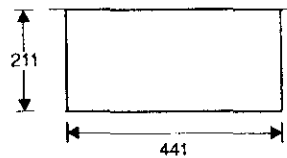
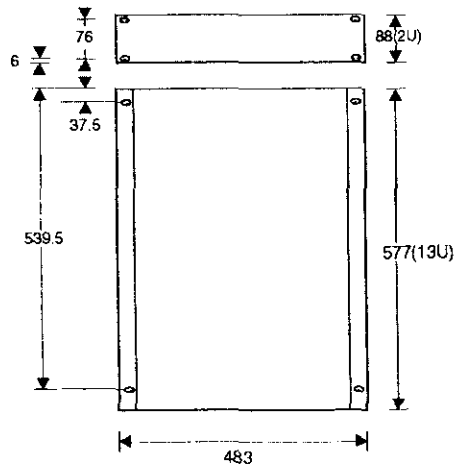
## Delta AVE Outline Dimensions



FREE STANDING CONSOLE



DESK TOP CONSOLE WITH FIXING BRACKETS

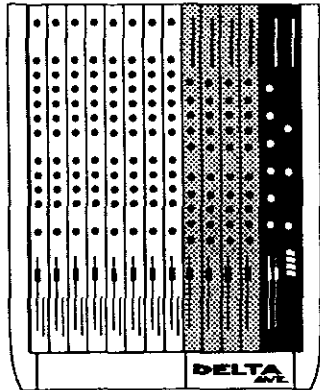


RACK MOUNT CONSOLE

All dimensions shown in millimetres (mm).

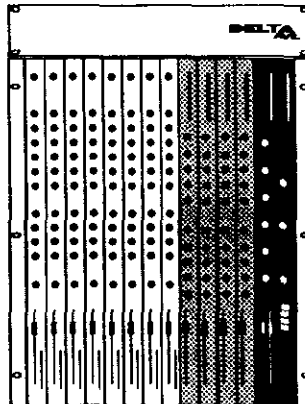
# Configurations

8 Input Frame  
available in Mono or Stereo versions



8:4:2

8 Input Rack Frame

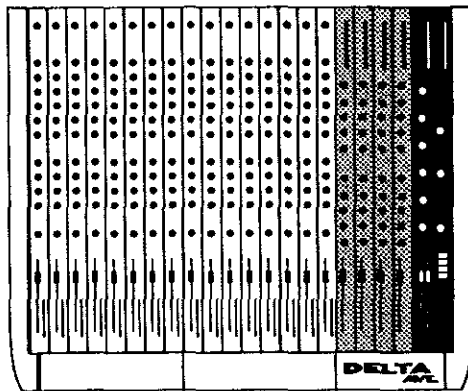


8:4:2 Rack

NOTES:

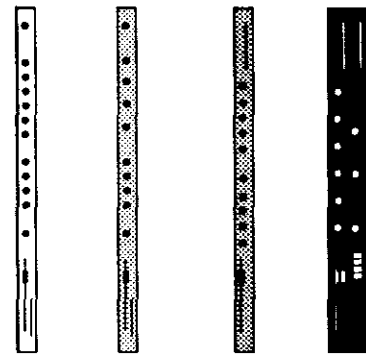
- The 8 & 16 Channel frames are also available with the side and front trim replaced with fixing brackets for flush fitting in a desk top.
- The Rack Frame requires 2U of blank space above for connector clearance.

16 Input Frame  
available in Mono or Stereo versions



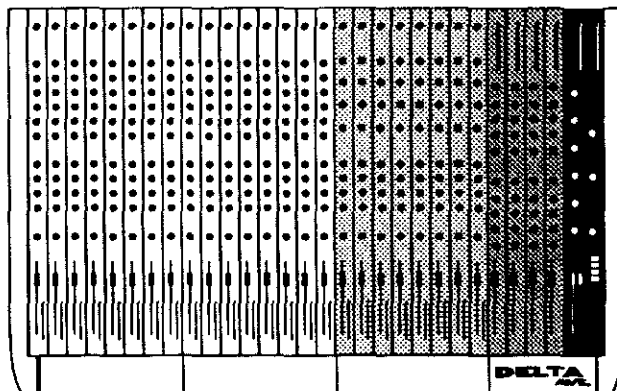
16:4:2

Key to Delta AVE Modules



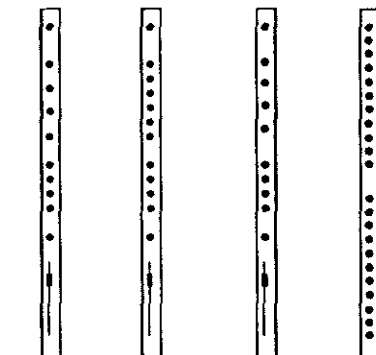
Mono Input    Stereo Input    Group Output    Master

24 Input Frame  
may be fitted with a choice of mono and stereo modules  
up to a maximum of 32 VCAs



24:4:2

Delta Module Options  
if no VCAs are required



Standard Input    Deluxe Input    Stereo Input    Dual Line Input

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.  |
| <b>VCA</b>                        | (Voltage Controlled Amplifier) a device which acts as a variable audio attenuator controlled by an external d.c. voltage.  |