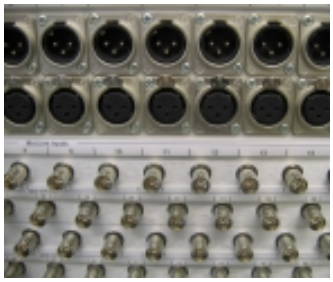
SIGMA
SYSTEM PLUS

INSTALLATION MANUAL

ISSUE 8

Calrec Audio Ltd
Nutclough Mill
Hebden Bridge
West Yorkshire
HX7 8EZ
England
UK

Tel: +44 (0) 1422 842159
Fax: +44 (0) 1422 845244
E-mail: enquiries@calrec.com
Website: www.calrec.com



Whilst the Company takes the utmost care in ensuring that all details in this document are correct at the time of publication, we reserve the right to alter specifications and equipment without notice. Any changes we make will be reflected in subsequent issues of this document. The latest version will be available upon request.

This publication is for International usage.

After Sales Modifications
Modifications to this equipment by any party other than Calrec Audio Limited may invalidate EMC and safety features designed into this equipment. Calrec Audio Limited can not be liable for any legal proceedings or problems that may arise relating to such modifications.

If in doubt, please contact Calrec Audio Limited for guidance prior to commencing any such work.

ESD (Static) Handling Procedures
In its completed form, this equipment has been designed to have a high level of immunity to static discharges. However, when handling individual boards and modules, many highly static sensitive parts are exposed. In order to protect these devices from damage and to protect your warranty, please observe static handling procedures, for example, use an appropriately grounded anti-static wrist band. Calrec will supply an electrostatic cord and wrist strap with all of it's digital products.

All modules and cards should be returned to Calrec Audio Limited in anti-static wrapping. Calrec Audio Limited can supply these items upon request, should you require assistance.

This applies particularly to digital products due to the types of devices and very small geometries used in their fabrication, analogue parts can however still be affected.

IMPORTANT HEALTH AND SAFETY INFORMATION

- This equipment must be EARTHED.
- Only suitably trained personnel should service this equipment.
- Please read and take note of all warning and informative labels.
- Before starting any servicing operation, equipment must be isolated from the AC supply (mains).
- Fuses should only be replaced with ones of the same type and rating as that indicated.
- Operate only in a clean, dry and pollutant-free environment.
- Do not operate in an explosive atmosphere.
- Do not allow any liquid or solid objects to enter the equipment. Should this accidentally occur then immediately switch off the unit and contact your service agent.
- Do not allow ventilation slots to be blocked.
- Do not leave the equipment powered up with the dust cover fitted.
- The rack mounting parts of this equipment must be fitted into an enclosure which complies with local regulations.

Cleaning

For cleaning the front panels of the equipment we recommend anti-static screen cleaner sprayed onto a soft cloth to dampen it only.

Explanation of Warning Symbols

The triangular warning symbols below contain a black symbol on a yellow background, surrounded by a black border.

The lightning flash with arrow head symbol within an equilateral triangle is intended to alert the user to the presence of dangerous voltages and energy levels within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock or injury.

The exclamation mark within an equilateral triangle is intended to prompt the user to refer to important operating or maintenance (servicing) instructions in the documentation supplied with the product.

Power Supply Blanking Plates (ZN4849-3 and ZN6020)

If you are in receipt of a ZN4849-3 or ZN6020 power supply unit please do not remove the blanking plates which are fitted to the unused output connectors. The maximum potential between the terminals exceeds 60 volts, the blanking plates are fitted to avoid the risk of electric shock.

CONTENTS

TECHNICAL SUPPORT

Should you require any technical assistance with your Calrec product then please contact your local distributor, if outside the U.K. and Ireland. For a list of Worldwide distributors please see the Calrec Web site at www.calrec.com or contact Calrec UK. For technical assistance within the UK and Ireland, please contact the Customer Support Team at :-

Customer Support
Calrec Audio Ltd
Nutclough Mill
Hebden Bridge
HX7 8EZ
England
UK

Tel: +44 (0) 1422 842159
Fax: +44 (0) 1422 845244
Email: support@calrec.com
Website: www.calrec.com

We can deal with all technical after sales issues, such as :-

- Arranging repairs
- Supply of replacement or loan units while repairs are being carried out
- Service / commissioning site visits
- Operational training courses
- Maintenance training courses
- Supply of replacement components
- Supply of documentation
- Technical advice by telephone

Customer Support Hours
Factory based customer support engineers can be contacted by telephone during normal office hours, or outside hours, a message can be left on the answering machine. All messages are dealt with promptly on the next working day. Alternatively a message can be sent to them by email.

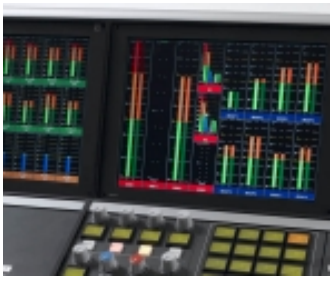
Product Warranty
A full list of our conditions & warranties relating to Goods & Services is contained in the Company's standard Terms and Conditions. A copy of this is available on request.

Repairs
If you need to return goods to Calrec, for whatever reason, please contact the Company beforehand in order that you can receive advice on the best method of returning the goods, and that a repair order reference number can be issued.

Standard of Service
Ensuring high standards is a priority, if you have any comments on the level of service, product quality or documentation offered to you by Calrec, then the Customer Support team would be pleased to receive your comments through any of the normal contact numbers, email or on the User registration form located at the end of this manual. If you have any other issues regarding your Calrec purchase, then please contact us and we will do our best to help. Calrec welcomes all Customer feedback.

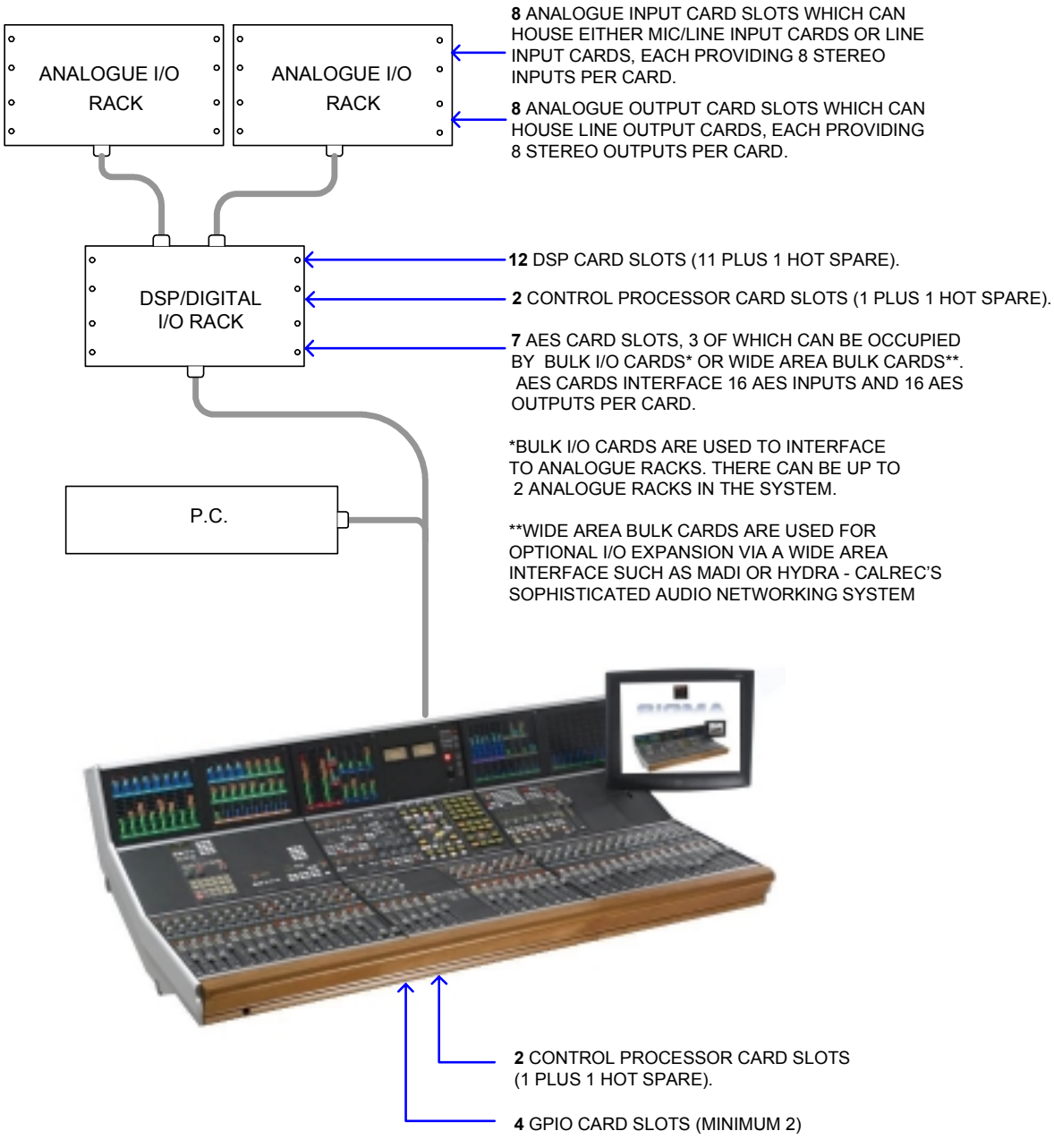
Overview






SYSTEM OVERVIEW

- Available in 3 frame sizes, 32 fader, 48 fader or 64 fader.
- 120 equivalent channels (Up to 48 stereo plus 24 mono channels or 60 stereo channels).
- Desk operates independently of PC.
- Independent DSP operation ensures audio continuity even during PC or control reset.
- Console and racks boot from power on in less than 20 seconds.
- Full control system reset in less than 15 seconds.
- Last settings fully restored on power-up or re-set.
- Automatic change over to hot spares for power supplies, control cards and DSP cards.
- All cards and modules are designed to be hot plugged.
- All cards and modules are designed to initialise upon insertion.



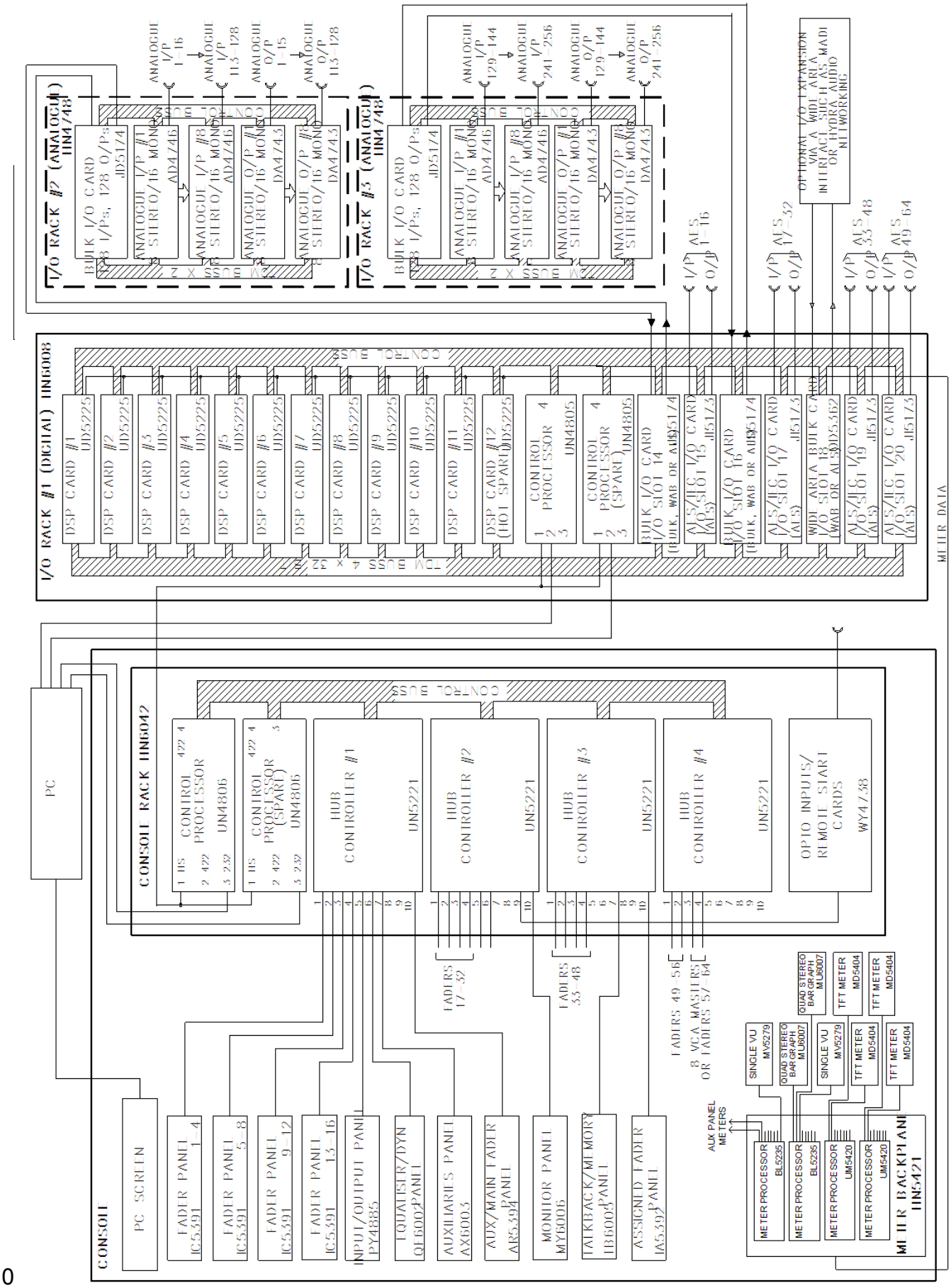
AUDIO PACKS

The console can be supplied in a combination of four basic Audio Packs providing pre-defined numbers of channels and I/O. Each of the four packs A, B, C and D are available with all stereo channels or a specific mono/stereo configuration as described below:

All desk output allocations must be derived from the above standard port provisions. However, they may be expanded by purchasing additional interface cards.

Audio Pack	A1	A2	B1	B2	C1	C2	D1	D2
Stereo Channels	26	36	28	44	32	48	48	60
Mono Channels	12	0	24	0	30	0	24	0
Mono/Stereo Groups	8	8	8	8	8	8	8	8
Mic/Line Inputs	48	48	64	64	80	80	96	96
Line Inputs	32	32	32	32	32	32	32	32
Line Outputs	64	64	80	80	96	96	112	112
AES Inputs	32	32	48	48	64	64	80	80
AES Outputs	32	32	48	48	64	64	80	80

TYPICAL DIGITAL SYSTEM DIAGRAM



EQUIPMENT LIST

Depending on the options purchased, you should expect to receive the following:

1 Control Surface
As specified in the quotation, and including:

- 1 Console Processor (2 if the hot spare option has been purchased)
- 2-4 Relay/Opto cards, in line with the quotation.

1 DSP/Digital I/0 rack

- 1 Rack Control Processor (2 if the hot spare option has been purchased)
- Up to 12 DSP cards (11 plus hot spare), in line with the quotation
- One Bulk I/O card per Analogue I/O Rack in the system
- One Wide Area Bulk I/O card for each optional I/O expansion interface, such as MADI or Hydra (if purchased)

1 or 2 Analogue I/O racks

- 1 Bulk I/O card to interface to the DSP/Digital I/O Rack
- Up to 8 Mic/Line or Line input cards, in line with the quotation
- Up to 8 Line Output cards, in line with the quotation

1 Bulk Power Supply Unit Rack

- Up to 3 Bulk PSU modules (dependent on size of console and its distance from the DSP/Digital I/O Rack, and whether a hot spare is required)

A number of Multi-Rail Power Supply Units

- 1 Multi-Rail PSU is required for systems with just one Analogue I/O rack, 2 are required for systems with two Analogue I/O racks, plus 1 or more hot spares if required.

A number of Fan Trays

- 1 Fan Tray will be supplied for each Rack in the system. The Fan Trays are to be positioned above each rack.

1 PSU monitor unit

1 PC

1 Set of system cables

ENVIRONMENTAL CONSIDERATIONS

Temperature Range:
Operating 0°C to +30°C (32°F to +86°F) in the immediate environment.
Non-operating -20°C to +60°C (-4°F to +140°F).

Relative humidity:
Operating 25% to 80% non condensing.
Non-operating 0% to 90% non condensing.

Altitude:
Operating up to 2,000 metres (6562 feet). (This is the limit to which the safety tests are valid).
Non-operating up to 15,000 metres (49213 feet).

EARTHING

The control surface, DSP/Digital I/O and Analogue I/O racks are provided with chassis earth studs. These must be connected to a common earth buss before any AC power is applied to the system. The system power supplies and PC are earthed via their AC power inlets.

AC (MAINS) POWER

All power supplies are rack-mounting and are seperate from the units they power, except for the PC which has a built-in power supply. AC (Mains) Power inlets are IEC type.

Each power supply unit in the Bulk PSU rack has one inlet.
Each Multi-Rail power supply unit has one inlet.
The PC has one inlet.
There is one inlet on the rear of the control surface, for any AC powered equipment which needs to be housed within it.

The whole system must be powered from the same phase of the AC power supply. All modules, cards and cables are designed to permit hot plugging.

SCREEN MAINTENANCE

Touch Screen
If the console is installed into an outside broadcast vehicle, it is important that the touch screen monitor is secured using suitable fixings during transit to prevent movement, and possible damage. Calrec Audio Ltd is not liable for any damages to the touch screen, the touch screen arm, the console or any other items caused by movement or damage of the monitor and / or monitor arm.

TFT Screens
The TFT meter screens that are fitted in our consoles are industrial units. The display manufacturer states that screen brightness may reduce to 50% of the initial value after the unit has been running at maximum brightness for 50,000 hrs. We do not believe that there are any burn-in or image-persistence issues with this type of TFT display

The TFT screens should be cleaned with a micro-fibre cloth, dampened only with clean water. Do not use any corrosive chemicals, solvents or window cleaning solutions.

The TFT screens have no user-servicable parts. Should you encounter a problem with any of your screens, please contact Calrec.

SYSTEM SPECIFICATION

DIGITAL INPUTS	
Formats Supported	AES/EBU (AES3) 24-bit Also suitable for use with SPDIF (IEC958 Type 2) signals
Interface	110 Ohm transformer balanced, 5V Pk-Pk 75 Ohm unbalanced (BNC), 1V Pk-Pk
Sample Rate Conversion	24-Bit switchable on all digital inputs
SRC THD+N	-117dB @ 1kHz, 0.00014%
DIGITAL OUTPUTS	
Formats Supported	AES/EBU (AES3) 24-bit
Interface	110 Ohm transformer balanced 4V Pk-Pk (nominal) into 110 Ohm load 75 Ohm unbalanced 1V Pk-Pk (nominal) into 75 Ohm load (BNC)

ANALOGUE INPUTS	
Analogue - Digital Conversion	24-Bit
Input	Electronically Balanced
Input Impedance	>1k Ohms for Mic gains 10k Ohms for Line gains
Sensitivity	+18 / -78dB on Mic/Line Input Card +18/-24dB on Line Only Input Card.
Equivalent Input Noise	-126dB (150 Ohm source)
Distortion	-1dBFS @ 1kHz - Better than 0.003% -20dBFS @ 1kHz - Better than 0.006% -60dBFS @ 1kHz - Better than 0.3%
Frequency Response	20Hz to 20kHz +/- 0.5dB on Mic/Line Input Card 20Hz to 20kHz +/- 0.25dB on Line Only Input Card

ANALOGUE OUTPUTS	
Digital - Analogue Conversion	24-Bit
Output Balance	Electronically Balanced, 20Hz to 20kHz, Better than -35dB, typically -45dB
Output Impedance	<40 Ohms
Distortion	-1dBFS @ 1kHz - Better than 0.006% -20dBFS @ 1kHz - Better than 0.003% -60dBFS @ 1kHz - Better than 0.3%
Frequency Response	20Hz to 20kHz +/- 0.25dB

- Analogue input for 0dBFS can be pre-set globally to +28, +24, +22, +20, +18 or +15 dBu
- Pre-fader headroom on analogue inputs is adjustable globally from +24 to +36dB in 2dB steps
- Analogue output for 0dBFS Matches input setting into >1kOhms (+24dBu max into 600 Ohms)

PERFORMANCE	
Digital to Digital (AES/EBU) Distortion	-1dBFS, 20Hz to 10kHz - Better than 0.002%
Digital to Digital (with SRC) Distortion	-1dBFS, 20Hz to 10kHz - Better than 0.005%
Frequency Response (Analogue Input to Output)	20Hz to 20kHz +/- 0.5dB
SYNCHRONISATION	
48kHz synchronisation	NTSC/PAL Video Internal Crystal Reference TTL Wordclock (48kHz +/- 100Hz) AES/EBU Digital Input (48kHz +/- 100Hz)

The system can be pre-set with up to five external sync sources, plus internal, such that if the 1st source fails, it will automatically switch to the 2nd, and so on.

Frame Options and Dimensions

CONTROL SURFACE FRAME SIZES

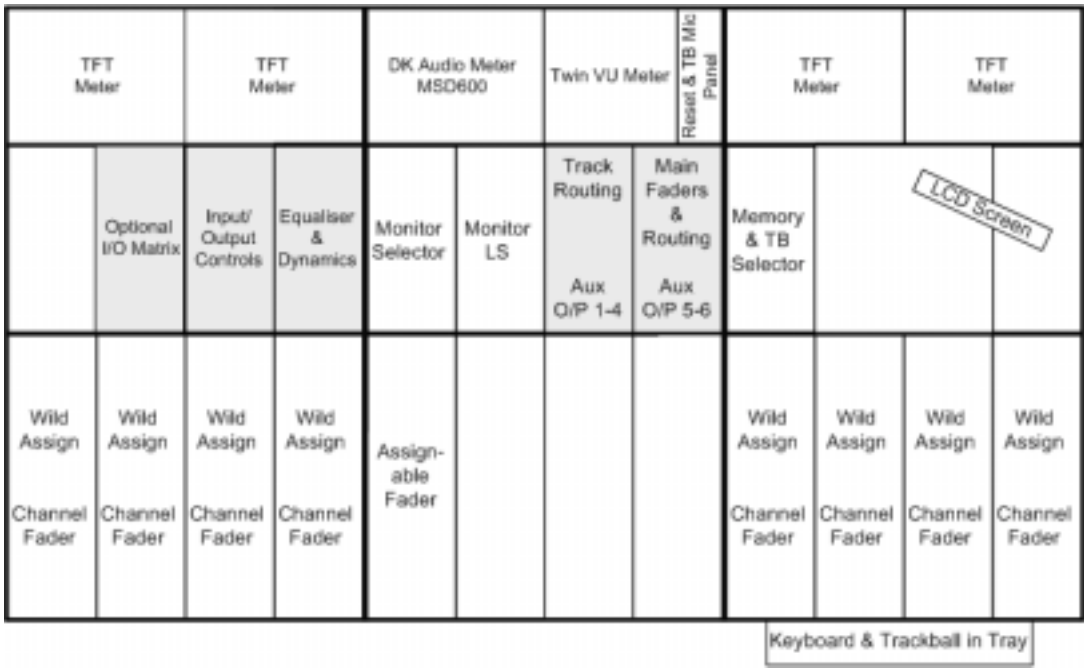
Frames are made up of sections which can be 4, 5 or 6 modules wide. This allows many different sizes of console to be achieved using different combinations of different sized sections. Fader modules have 4 faders each, so console size can depend on the number of faders required.

The table below shows the dimensions of the standard frame sizes available. Sections within the frame do not have to be in the order shown. For details of custom frames, with wedge sections etc, please contact Calrec.

No of Modules Wide	Frame	Length		Depth	
		inches	mm	inches	mm
12	4:4:4	60.9	1547	38	964
13	4:4:5	65.9	1672	38	964
14	4:6:4	70.8	1797	38	964
15	4:6:5	75.7	1922	38	964
16	6:4:6	80.7	2047	38	964
17	5:6:6	85.6	2172	38	964
18	6:6:6	90.5	2297	38	964
19	5:4:4:6	95.7	2428	38	964
20	6:4:4:6	100.6	2553	38	964
21	5:4:6:6	105.5	2678	38	964
22	4:6:6:6	110.4	2803	38	964
23	5:6:6:6	115.4	2928	38	964

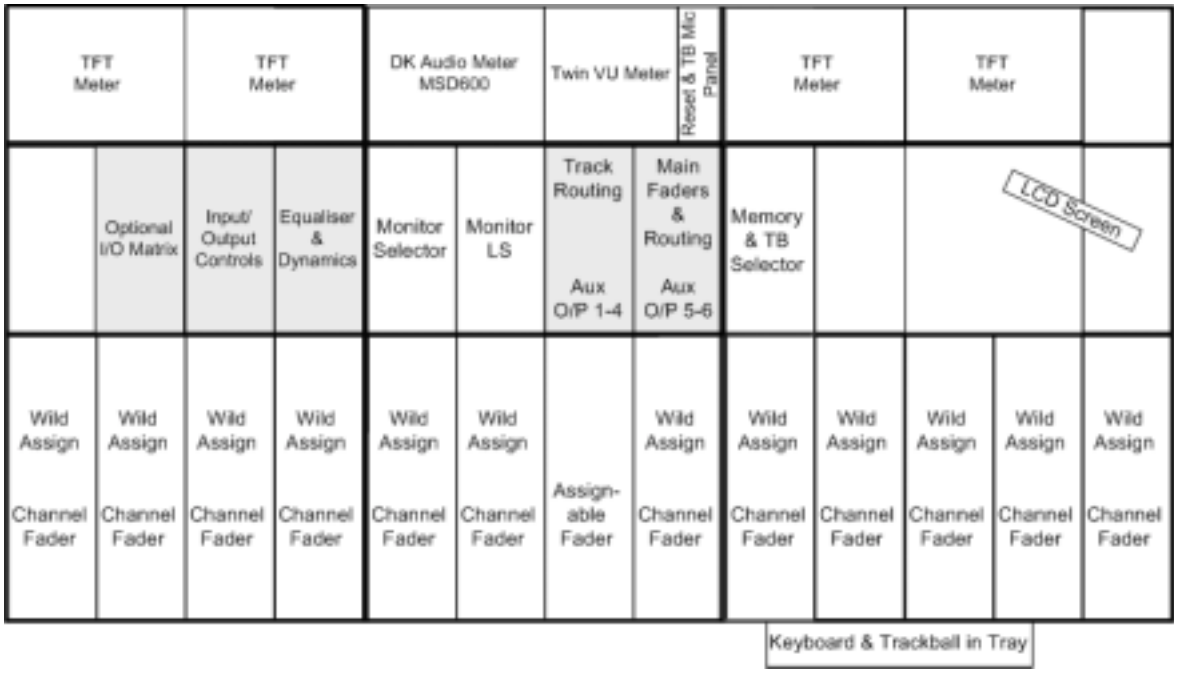
Typical Frame (4:4:4)

This example shows a 32 fader console, using a 4:4:4 frame. With 2 audio paths on each fader, this allows up to 64 channel faders within a frame only 1547mm (60.9 inches) wide. Optional dedicated group faders can be fitted if required. The Assign panels are shown shaded.



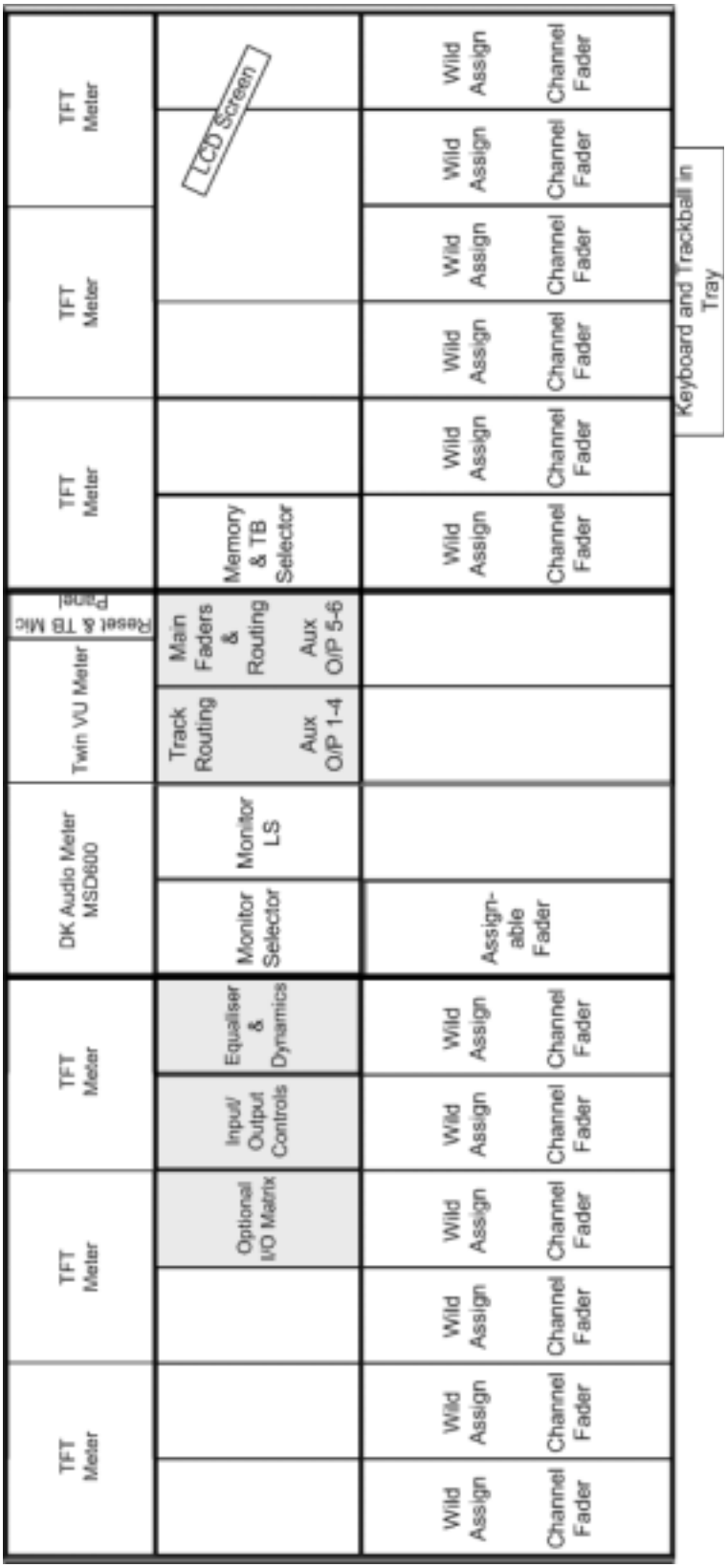
Typical Frame (4:4:5)

This example shows a 48 fader console using a 4:4:5 frame. With 2 audio paths on each fader, this allows up to 96 channel faders within a frame only 1672mm (65.9 inches) wide. The Assign panels are shown shaded.



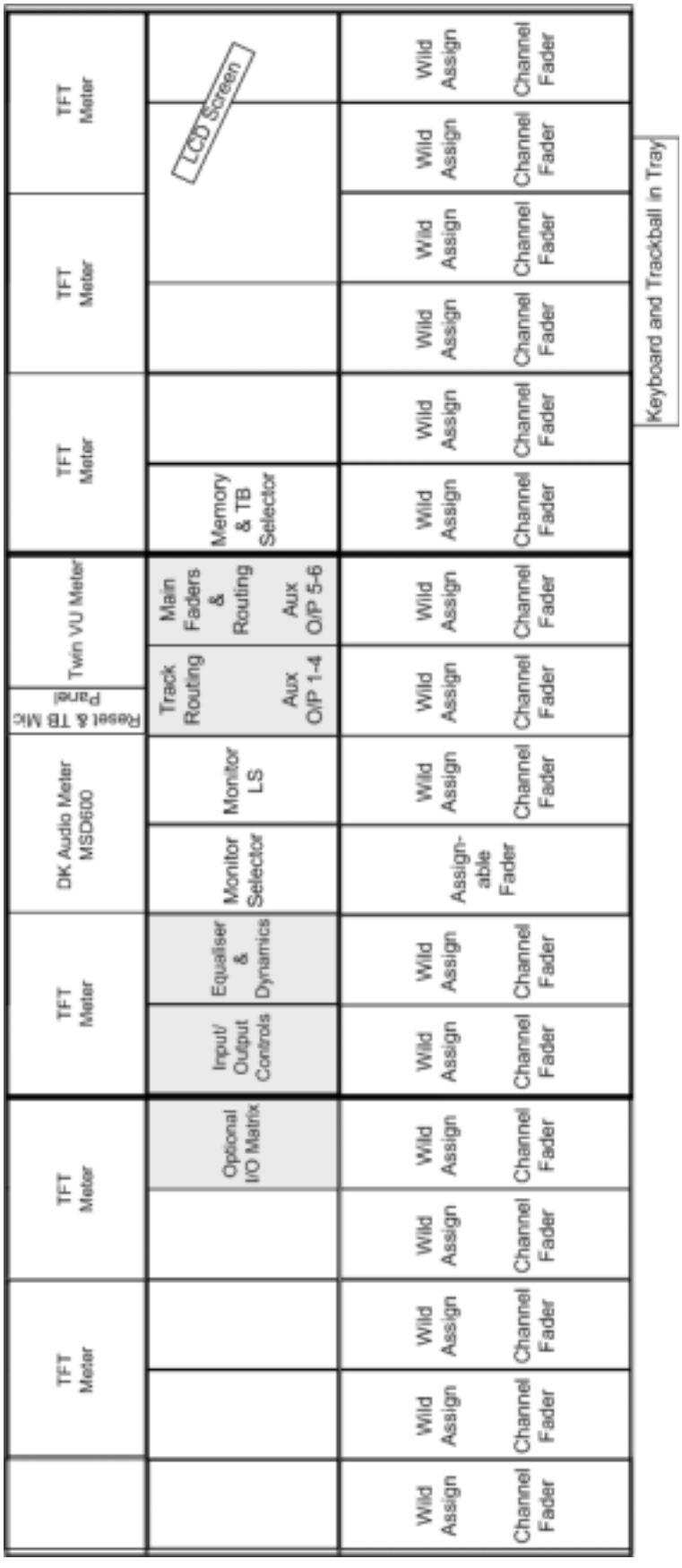
Typical Frame (6:4:6)

This example shows a 48 fader console using a 6:4:6 frame, and the landscape monitor panel. With 2 audio paths on each fader, this allows up to 96 channel faders within a frame only 2047mm (80.7 inches) wide. Optional dedicated group faders can be fitted if required. The Assign panels are shown shaded.



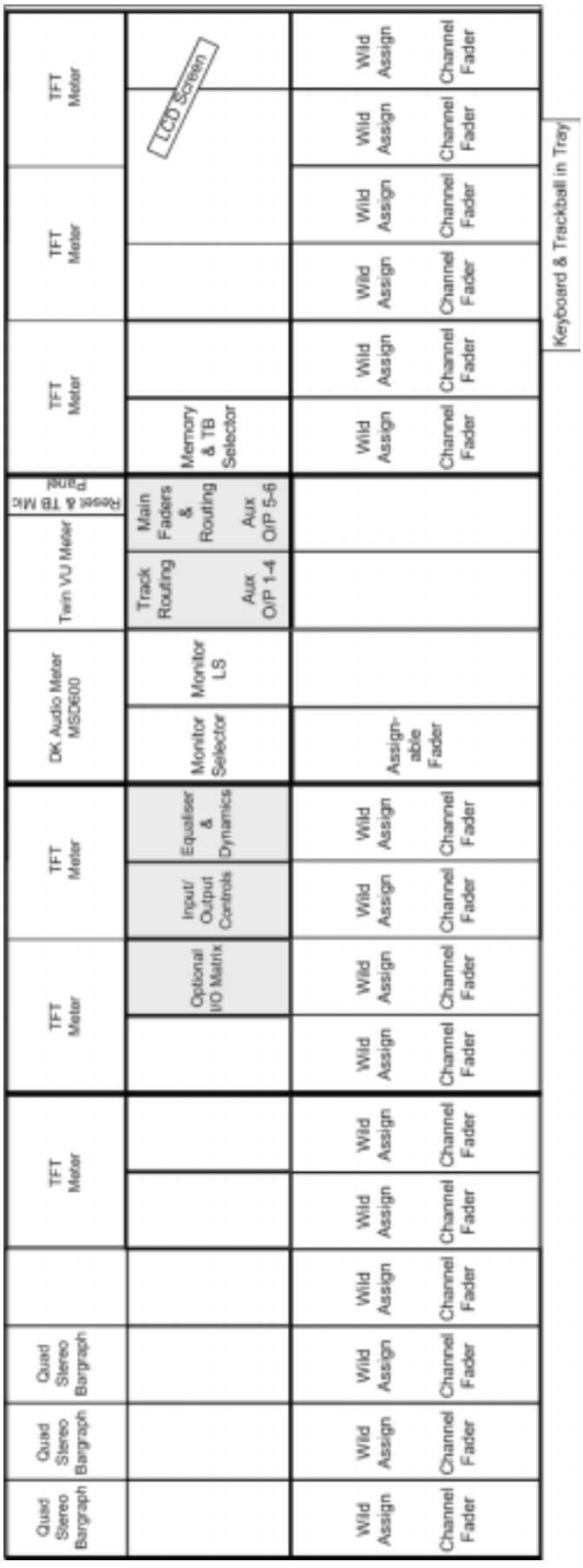
Typical Frame (5:6:6)

This example shows a 64 fader console, using a 5:6:6 frame and the portrait monitor panel. With 2 audio paths on each fader, this allows up to 128 channel faders (more faders than the maximum number of available paths), within a frame only 2172mm (85.6 inches) wide. The Assign panels are shown shaded.

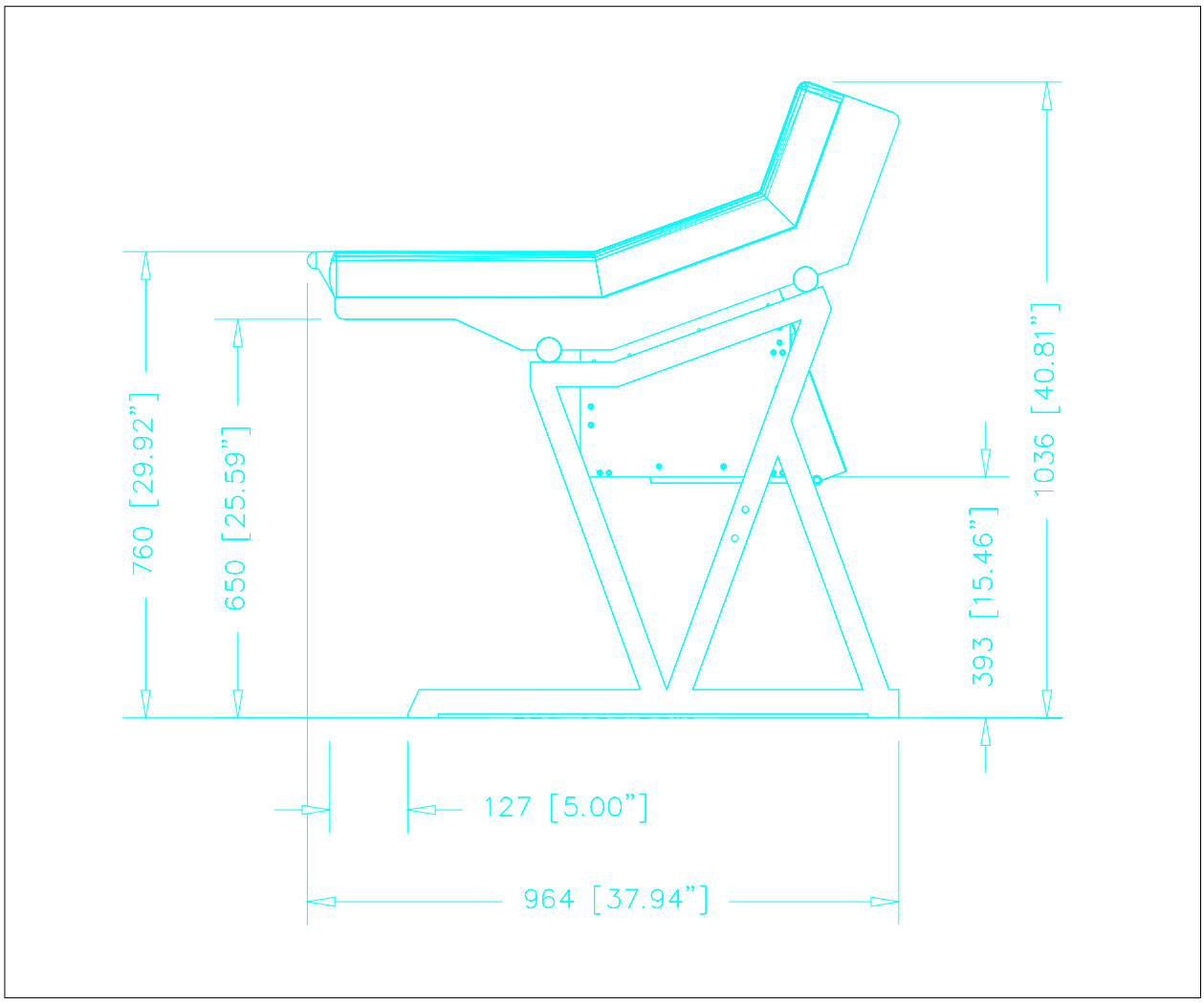


Typical Frame (6:4:4:6)

This example shows a 64 fader console, using a 6:4:4:6 frame and the landscape monitor panel. With 2 audio paths on each fader, this allows up to 128 channel faders (more faders than the maximum number of available paths), within a frame only 2559mm wide. Optional dedicated group faders can be fitted if required. The Assign panels are shown shaded.

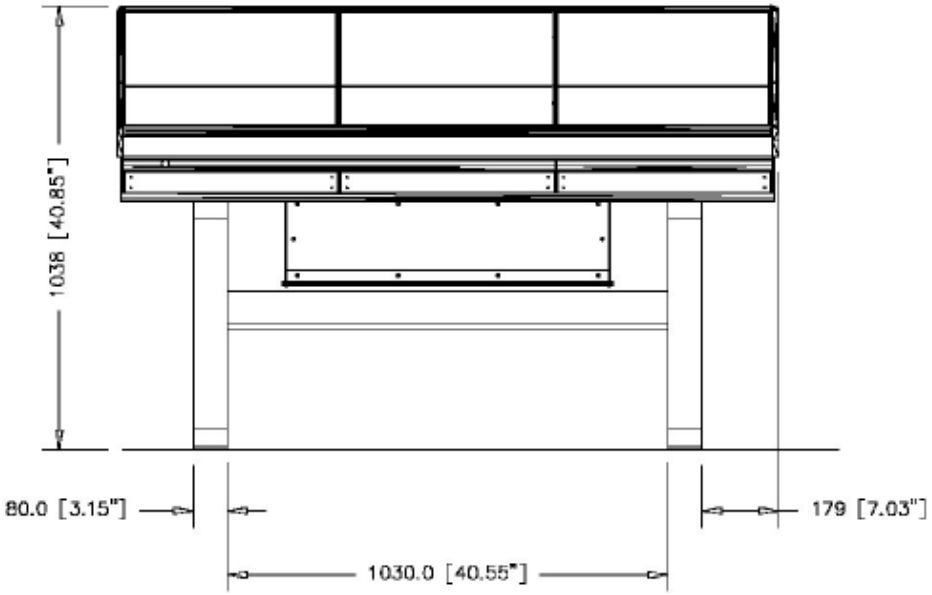


END ELEVATION

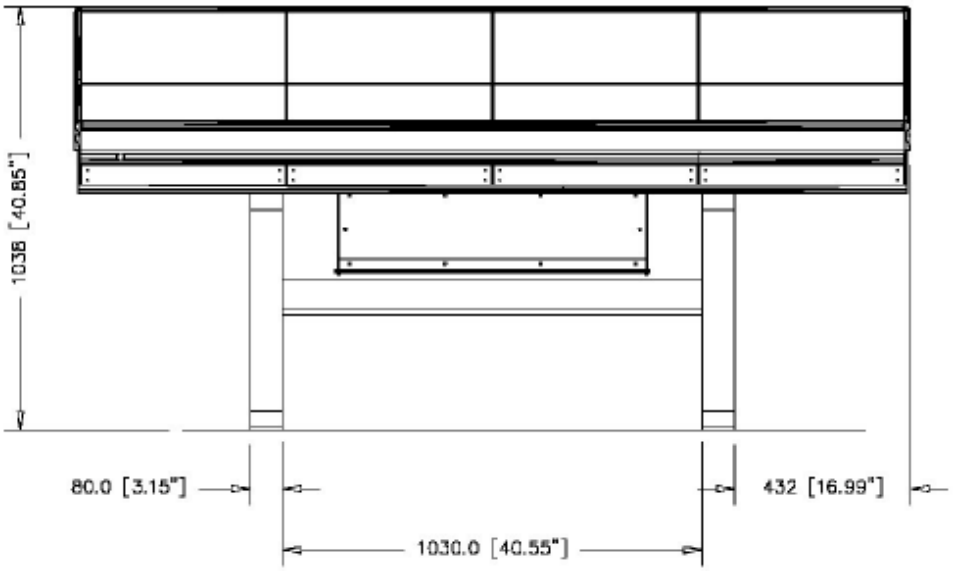


The end elevation dimensions are the same for all frame sizes. The control surface can be seperated from the stand for access to the premises. The control surface sections can also be split apart if required.

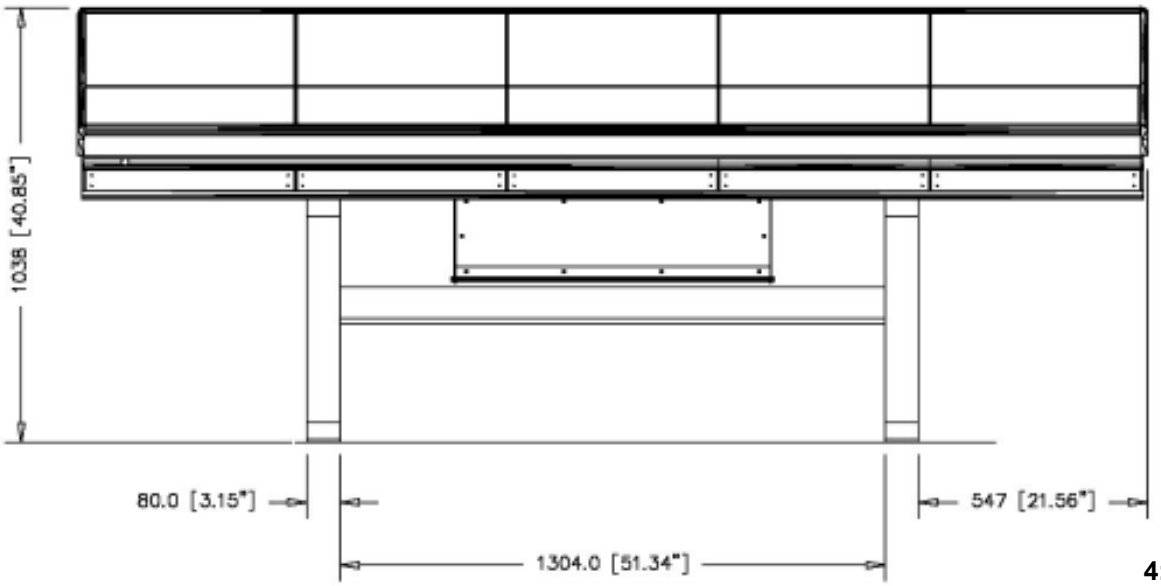
FRONT ELEVATION



4:4:4 Frame

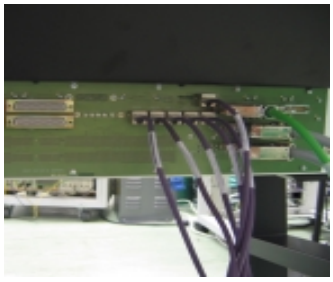


4:4:4:4 Frame

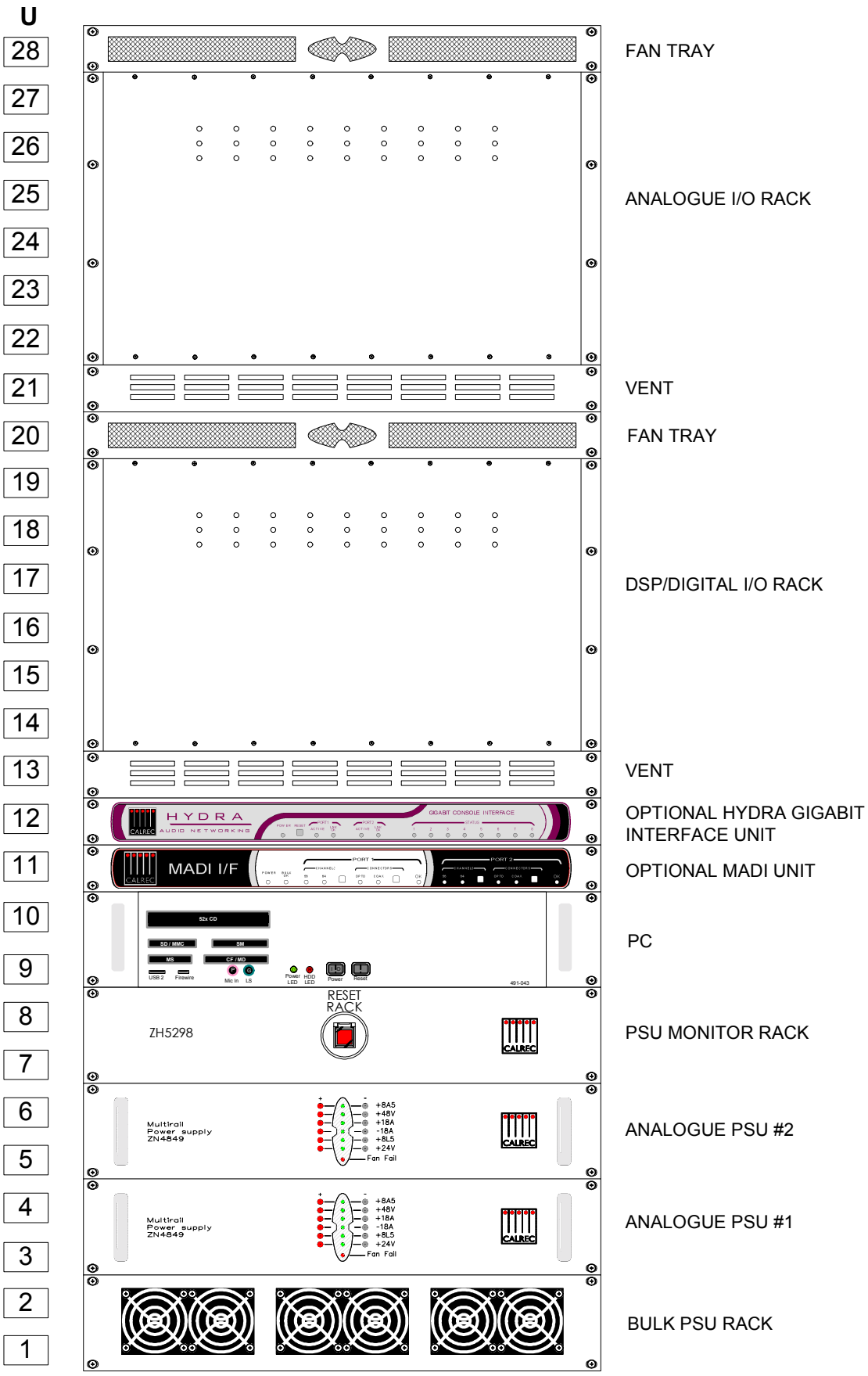


4:4:4:4:4 Frame

Equipment Installation Information

TYPICAL RACK LAYOUT



RACK SPECIFICATIONS

It is recommended that all equipment over 8Kg (17.5 lbs) in weight, or over 150mm (6 inches) deep is mounted into equipment bays which offer mechanical supports under each of the units. This will allow units to be supported as they slide forward during removal for maintenance purposes.

Equipment can be mounted in separate enclosures. Please refer to the cable lengths table before planning this. The PSU monitor rack can be mounted on the rear of the equipment bay if desired.

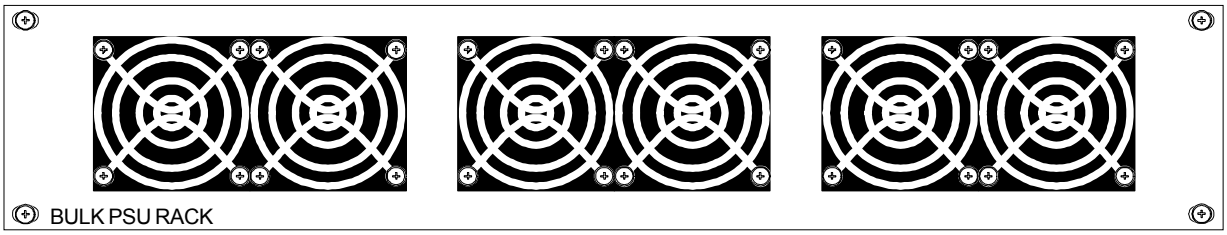
Each audio rack (DSP/Digital I/O, and AnalogueI/O) is supplied with a 1U low noise fan tray which should be positioned immediately above the rack. The fan tray incorporates a baffle such that warm air is sucked up out of the rack and out through the rear of the fan tray. A vent in the front of the fan tray allows ambient air to enter. The baffle deflects this air up into the rack above.
The bottom rack should have a 1U vent beneath it to allow ambient air to enter. It should also not be positioned above any equipment producing significant heat.

Items	Heig-ht	Approx depth (incl. mating cons)		Approx weight		Approx Power Output (W) (full load)	Approx AC Power (VA) (full load)
		inches	mm	lbs	kgs		
DSP/Digital I/O Rack (fully populated)	6U	18.9	480	38.4	17.4	-	-
Analogue I/O Rack (fully populated)	6U	18.1	460	26	11.8	-	-
Bulk PSU rack * with one PSU	2U	18.5	470	17.4	7.9	1000	1250
Extra PSU for Bulk rack	-	-	-	7.3	3.3	1000	1250
Multi-Rail PSU *	2U	18.1	460	22.1	10.0	460	660
Power for Hot spare (any type)	-	-	-	-	-	No extra	Less than 5% extra
Fan Tray	1U	19.7	500	6.6	3.0	-	-
PSU Monitor box	2U	6.7	170	4.4	2.0	-	-
PC*	2U	23.7	600	27	12.2	-	400
MADI Unit	1U	11.9	300	7	3.2	-	-
Hydra Gigabit Interface Unit	1U	10.4	265	6	2.7	-	-

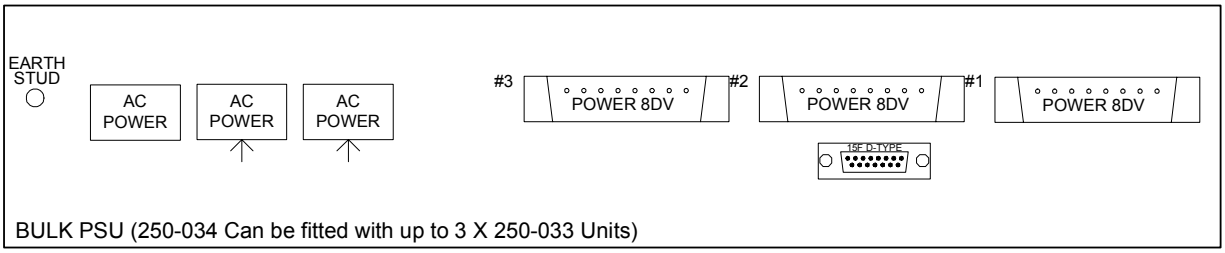
* These units have handles protruding approx. 1.3” (32mm) from the surface of the front panel.

BULK PSU

Front



Rear



The Bulk PSU Rack is a 2U rack which can hold up to three identical 24V 1kW plug-in power supplies. The rack has separate AC power inputs and DC outputs for each of the three plug-in power supplies on the rear of the unit. Any of the plug-in power supplies can be removed from the rack without disturbing the operation of the others. Diode feeding allows supplies to be parallelled together. The control surface and DSP/Digital I/O Rack are powered as one unit from one of these 2U racks. The control surface is separately powered from another of these 2U racks. The number of plug-in power supplies required is dependent upon the size of the system, the distance between console and rack, and the hot spare requirement (to provide redundancy).

Each of the plug-in power modules has its own cooling fan. The warm air is directed out of the rear of the rack. To ensure proper cooling, the power system requires a minimum clearance of 50mm (2 inches) from the fans and rear air outlets, and also any walls or other surfaces.

The unit should be mounted by means of the side brackets, each of which has two mounting holes. It should always be mounted in a horizontal position. The rear mounting brackets should be used when no support is provided under the rack assembly, the rack should not be supported by front flanges alone. The rear mounting brackets fix to the rear of the studio equipment bay. Extensions of the rack sides slot into these rear supports, allowing the Bulk PSU rack to be removed without removing the support.

Input Power Connections

3-wire safety AC outlet sockets should be located near the power system (number as required). Each line cord will provide AC power to one of the power supply modules. The AC line cord is the mains disconnect for each module. The AC line cords should have an IEC320 connector to plug into the rear of the power system chassis. Each line cord MUST be suitably rated and FUSED (or have an equivalently rated circuit breaker). For 230V mains, the rating is10A for the line cords and breakers. For 115V mains, the rating is 15A, (line cords are known as SVT or SJT type).

Do not remove the ground conductor. The ground conductor is connected to safety ground to minimize electrical shock hazard and ensure low EMI (electromagnetic interference). The grounding lug, located on the rear panel, is a bonding for connection of the chassis to other system chassis assemblies. Safety grounding is provided via ground connections in the line cord entry receptacles.

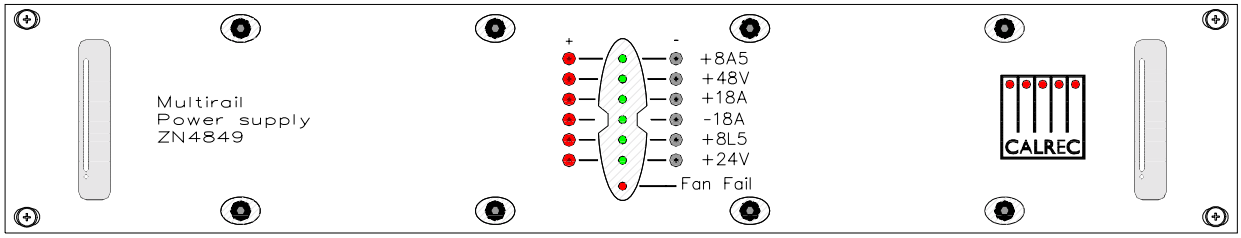
System Fan Noise (dB SPL A-Weighted)

These measurements were taken on axis at 1 metre from the dominant noise source:

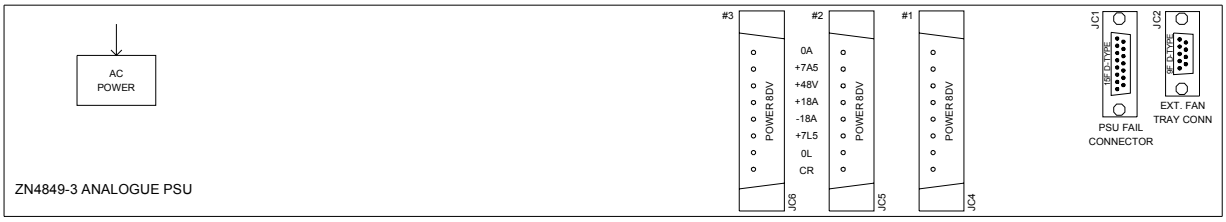
Bulk PSU Rack	
1 x 24V 1kW PSU	49dBA
2 x 24V 1kW PSU	52dBA
3 x 24V 1kW PSU	54dBA

MULTI-RAIL PSU

Front



Rear



Each Analogue I/O Rack uses a 2U Multi-Rail PSU. An additional Multi-Rail PSU can serve as a hot spare. The hot spare can provide power redundancy for several Analogue I/O Racks, provided they are housed together. If the Analogue I/O Racks are housed in different locations, each may require a hot spare, although, this is dependent upon the cable lengths involved. All hot spares are optional. Diode feeding allows supplies of the same type to be parallelled together.

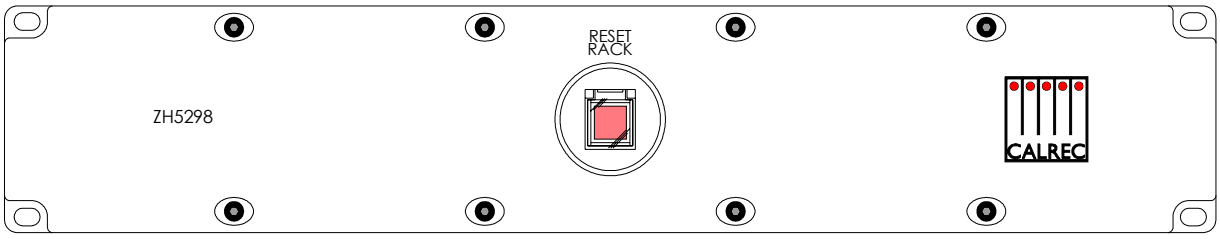
Multi-Rail power supply units are fitted with rear flanges to allow the rear of the unit to be bolted to the studio equipment bay. In outside broadcast situations, the unit should ideally be located into an equipment bay which offers mechanical support from underneath.

Cooling

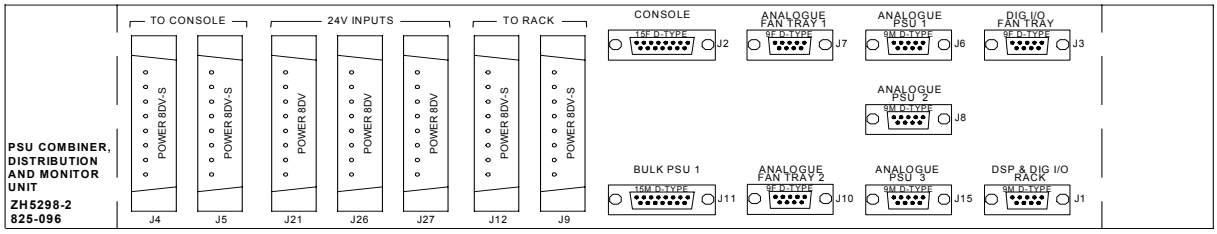
The Multi-Rail PSU is also fan cooled but uses a very low noise fan, drawing air from side to side through the unit, instead of in from the front, to further minimise noise. Should any of the fans slow down or stop, or any voltage rail fall outside specified limits, a PSU fail signal will be sent to the console and PC to warn the operator of a problem.

PSU MONITORING AND DISTRIBUTION UNIT

Front



Rear



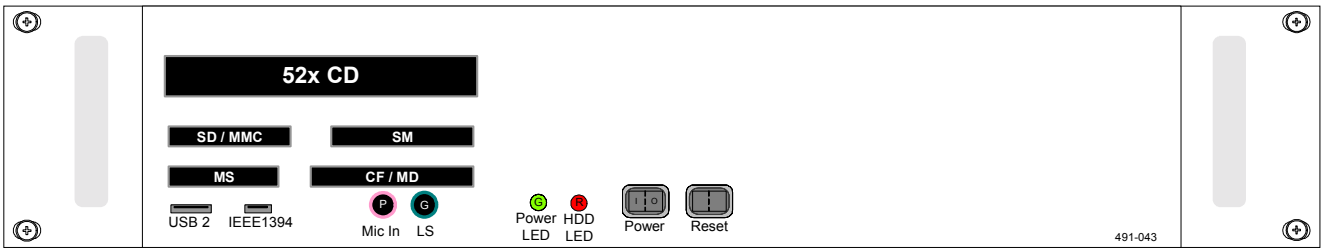
The Power Monitoring and Distribution rack monitors the power supplies for failures, and ensures changeover to the spare should a fault develop. The Reset button reboots the racks only, the control surface is unaffected. **PLEASE NOTE:** Resetting the racks will result in a brief audio interruption.

This unit should be secured into the front of the bay by the two standard fixing holes in each of the two 2RU front angles. The unit/s should always be mounted in a horizontal position. It is recommended that the rack is not supported by the front flanges alone.

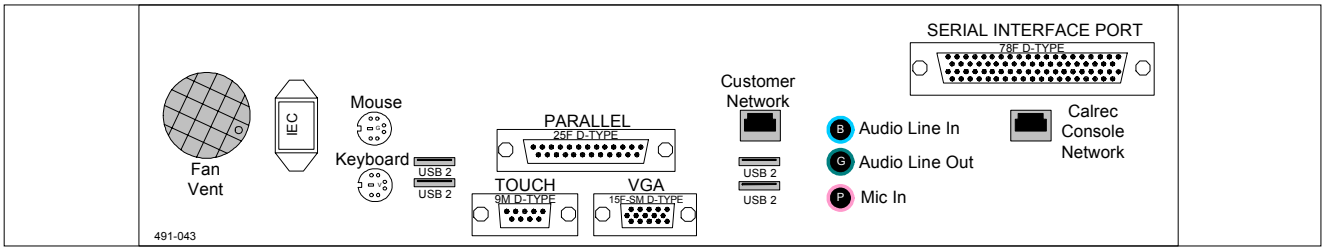
PC INFORMATION

Operating System	Windows XP
CPU	Intel Celeron Processor (2GHz+)
RAM	256 MB DDR RAM
HDD	40GB
CD ROM	52x
Network Ports	2 x 10/100
Card Slots	Compact Flash/Microdrive, SmartMedia, Memory Stick, Secure Digital/Multimedia Card
USB 2 Ports	4 (Rear of Unit), 1 (Front of Unit)
IEEE1394 Port	1 (Front of Unit)
Additional Hardware	8 Port Serial Card
Additional Software	PC Anywhere

Front



Rear



Mounting Instructions

The PC should be mounted by means of the side brackets, each of which has two mounting holes. The PC rack should always be mounted in a horizontal position. The sliders should be used when no support is provided under the PC assembly. The PC should not be supported by front flanges alone. Failure to follow these instructions may invalidate the warranty. The PC is earthed via its AC power inlet.

Remote Access

USB connectors are provided on both the front & the rear of the PC for the option to add an external modem of your choice. If a modem is added, and a suitable telephone line installed, the console can be remotely accessed by Calrec Support Engineers to aid software upgrades and diagnostic work. This can greatly enhance the level of service and support we can provide. A dial-up facility must first be activated at the PC before this is possible, to ensure that connections are not made at inappropriate times or without the user's knowledge and consent.

Network Ports

A network port is provided to enable the user to connect to their own LAN. Calrec will not be responsible for the configuration of this port or for any performance issues arising from its use. A second Ethernet port is provided to enable the PC to be connected to a Calrec Hydra Audio Network, which is an option which can either be purchased with the console or in the future.

Software Supplied

An OEM PC Operating System license is supplied with each console, and the operating system software is pre-installed. The console software is also pre-installed, and supplied on a CD-ROM.

3rd Party Software

Calrec recommends that the PC is regarded as an integral control device for the console, and not as a general purpose PC. If 3rd party software is installed on the PC, care must always be taken to ensure that it does not interfere with the normal performance of the PC. The installation of inappropriate software on the PC may invalidate the console warranty.

Usernames and Passwords

The PC will be set up with two sets of usernames and passwords:

Username	Password	Description
CalrecAudio	(None)	This user can install and run programs, but not change PC hardware settings, (i.e. set-up network, install drivers). This user is intended to be used during normal operation of the PC.
CalrecAudioAdmin	calrec	This user has full rights to the PC, and can install and change PC hardware settings. This user is intended for use during re-configuration of the PC and to set up Hydra Audio Networking.

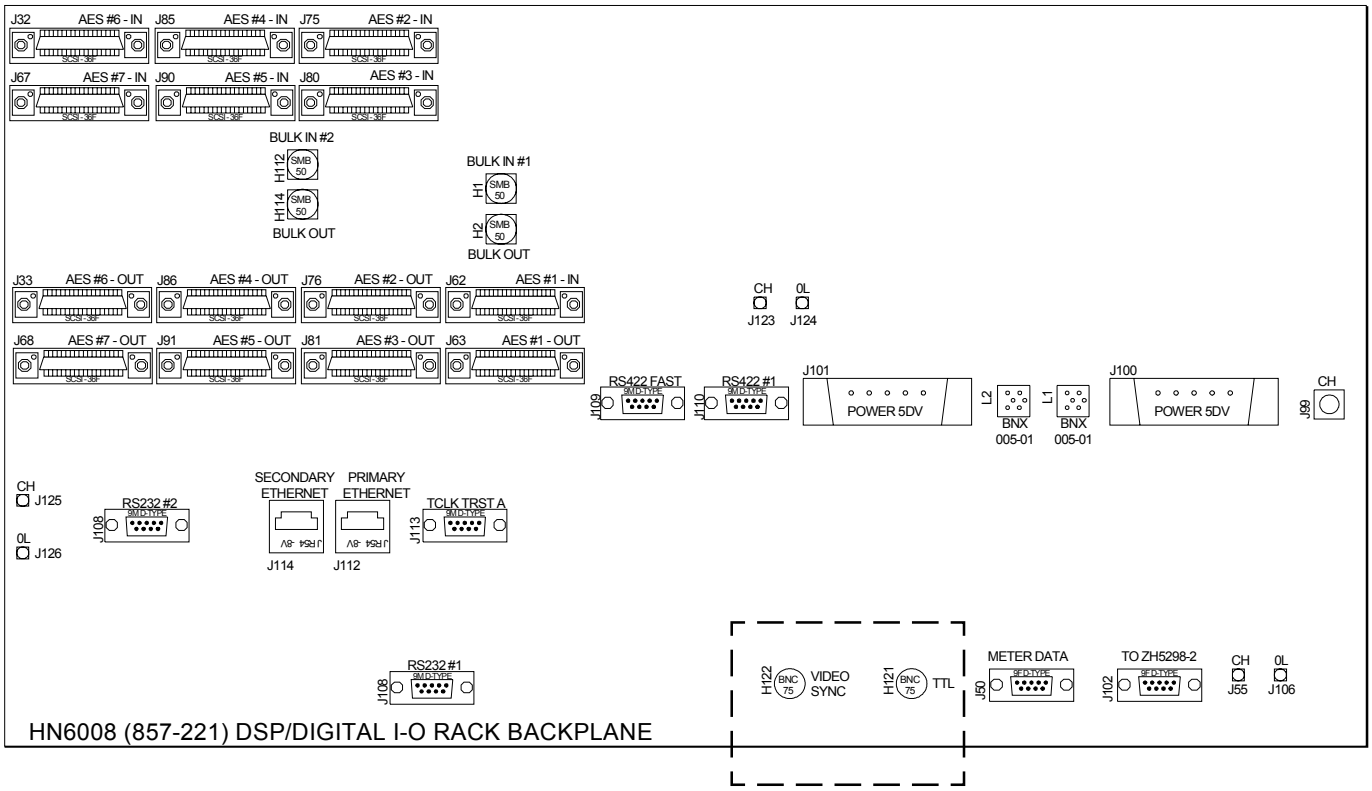
File Backup

A number of flash card slots are provided on the front of the PC for file backup. In addition, backup could also be to a customer's LAN or to a USB device which can be plugged into the front or rear of the PC. The following files are not installed from the CD-ROM as they are specific to each individual console. As such, a backup copy should be kept of these files in-case of PC or hard-drive failure:

Filename	Description
C:\Sigma\Cust1\Config.ini	This file should only be altered by an approved Calrec engineer using a specifically designed application. The file can be copied but any unauthorised changes made will render it inoperable, including changing the date stamp of the file (such as saving even if not edited). If the file needs to be e-mailed to Calrec for any reason it should always be zipped to protect the file time/date stamp. A new backup copy of this file should be made after a console upgrade.
C:\Sigma\Cust1\Setup.ini	This file is updated when changes to console settings are made and saved using the set-up application. It should not be altered by any means other than by using the set-up application. A new backup copy of this file should be made after such changes are made or after a software upgrade.
C:\Sigma\Cust1\Options\Options.bin (Or **C:\Sigma100\Cust1\Options.bin** in earlier software versions)	This file is updated and a new backup should be made when changes to any of the sub-pages of the options screen are made and saved.
C:\Sigma\Cust1\memories	This is the default location for the user memories. However, operators can choose to save them to any location they desire. The maintenance department should keep a backup of the important default memories, whilst operators should be encouraged to keep their own backups of their own memories and to update them whenever they make important changes to them. After a software upgrade the main set of memories will be upgraded and checked by the engineer carrying out the upgrade. A new backup should then be made of these memories.
C:\Sigma\Cust1\Meter	This is the default location for the user-definable meter configurations. If your console uses these, you should also keep a backup copy of the files in this folder.
C:\Sigma\Cust1\Monitor	This is the default location for the user-definable monitor panel configurations. If your console uses these, you should also keep a backup copy of the files in this folder.
C:\Sigma\Cust1\Network	If your console uses Hydra Audio Networking, you should also keep a backup copy of the files in this folder. These are the configuration settings for the network units.
For customers using Compaq PC's only: **C:\Sigma100\Cust1\A100fe1.ini** **C:\Sigma100\Alphaprg\Alphaprg.ini**	These files are installed from the CD-ROM in a default format. The settings in these files can vary in different Compaq PCs. The backup of these files should be updated after a software upgrade. If a new hard-drive is fitted to the original Compaq PC, these files should be used to over-write the versions installed by the CD-ROM.

SYNCHRONISATION

The system can be pre-set with up to five external sync sources, plus internal, such that if the 1st source fails, it will automatically switch to the 2nd, and so on. Please note that the facility for locking to external AES sources is restricted to the first six inputs of each AES card in the console. One of the external sources can be Video, (PAL or NTSC). TTL Wordclock is another possible external source. Synchronisation inputs for Video Sync (PAL or NTSC) and TTL Wordclock are provided on the rear of the DSP/Digital I/O rack, on 75Ω BNC connectors.

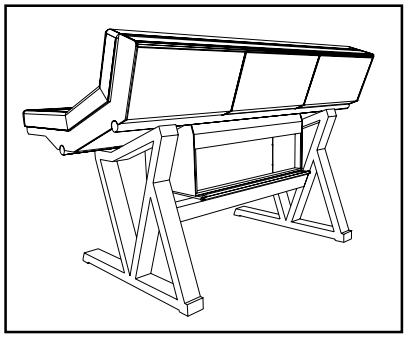


When using a digital input or wordclock as a source, the system will tolerate a variation of up to +/- 100 Hz in the frequency of the source. The console may also be synchronised from its internal crystal oscillator (48 kHz).

It is strongly recommended that all items of digital equipment connected digitally to the console are synchronised to the same sync signal.

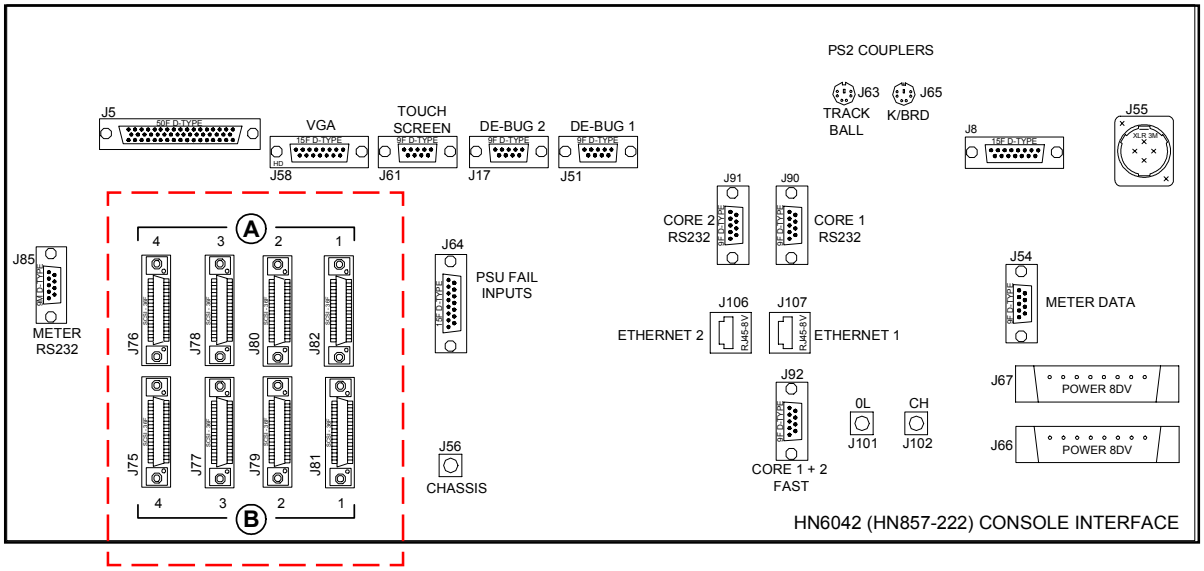
If the console's internal sync is to be the master, other digital equipment should be synchronised to the digital outputs of the console.

GPIO CONNECTIONS



Connections to the relay and opto isolators are provided on 36 way female SCSI connectors on the rear of the console. Up to 4 cards can be fitted, each of which can provide up to 16 relay-isolated outputs and 8 opto-isolated inputs.

* Note that on Relay/Opto card 1, relays 1 - 4 are not available, as they are used for TX, RX, PSU Fail and APFL facilities.



Relay Output Specification: 100mA maximum switch current, 30V maximum voltage.
Opto Input Specification: DC - 5 to 50 volts, positive or negative
AC - 5 to 50 volts peak, 50-60Hz.

A Connector 1 of 2

Pins	Circuit
1 . 19	5V
2 . 20	Opto 1
3 . 21	Opto 2
4 . 22	Opto 3
5 . 23	Opto 4
6	* Relay 1 No
24	Nm
7	Com
25	* Relay 2
8	Nm
26	Com
9	* Relay 3
27	Nm
10 .	Com
28	* Relay 4
11	Nm
29	Com
12	Relay 5
30	Nm
13	Com
31	Relay 6
14	Nm
32	Com
15	Relay 7
33	Nm
16	Com
34	Relay 8
17	Nm
35	Com
18 . 36	0V

B Connector 2 of 2

Pins	Circuit
1 . 19	5V
2 . 20	Opto 5
3 . 21	Opto 6
4 . 22	Opto 7
5 . 23	Opto 8
6	Relay 9
24	Nm
7	Com
25	Relay 10
8	Nm
26	Com
9	Relay 11
27	Nm
10 .	Com
28	Relay 12
11	Nm
29	Com
12	Relay 13
30	Nm
13	Com
31	Relay 14
14	Nm
32	Com
15	Relay 15
33	Nm
16	Com
34	Relay 16
17	Nm
35	Com
18 . 36	OV

DOLBY DP570 & DP564 SETUP (FOR CALREC REMOTE INTERFACE)

The following instructions are to set up a Dolby DP570 or DP564. Please also refer to the drawing opposite and schedule on the next page for connection details.

On the Dolby box:

<label> means press the button with the name label.

Power up the unit and wait for it to get going.
<setup>
<down arrow> until you see “SYSTEM SETTINGS”
<enter> Unit name is now displayed
<down arrow> until you see “GPI setup”
<enter> “GPI pin 23” is displayed
<enter> “GPI pin 23 trigger” is displayed
<enter>
<down arrow> until you see “Edge”
<enter>
<esc> “GPI pin 23 trigger” is displayed
<down arrow> “GPI pin 23 Polarity” is displayed
<enter>
<down arrow> until you see “Positive/High”
<enter>
<esc> “GPI pin 23 Polarity” is displayed
<down arrow> “GPI pin 23 Function” is displayed
<enter>
<down arrow> until you see “FULL” meaning surround.
<enter>
<esc> “GPI pin 23 Function” is displayed
<esc> “GPI pin 23” is displayed
<down arrow> “GPI pin 24” is displayed

Repeat the process for all the GPI pins 24 - 31 (as drawing/spreadsheet)

<esc> “GPI setup” is displayed
<down arrow> “GPO setup” is displayed

Now go though the same routine to set up the outputs on pins 7 to 14 (as drawing/spreadsheet) with trigger as “Level”, Polarity as “Positive/High”, and function as spreadsheet.

<esc> Until back at original menu.

Note: With issue 1 cable, the outputs were on pins 8 to 15.

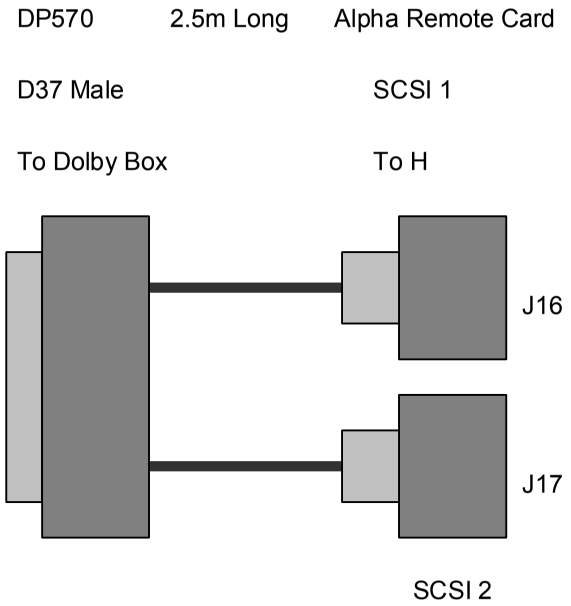
Dolby Multichannel Audio Tool Model DP570 to Alpha Remote Connection Cable (fully isolated)

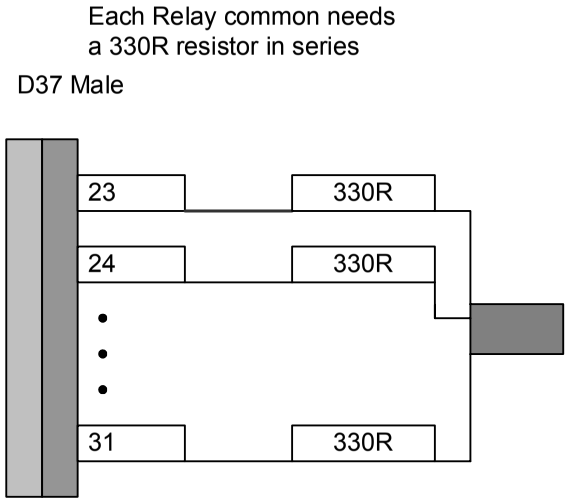
Designed to be plugged in second remote card

Dolby DP570 GPIO connector D37 Male	
pin	function
1	5V
2	Fault Output
3	Error_Output
4	User defined output
5	Solo tally output
6	Solo control input
7	Surround
8	Stereo
9	Mono
10	Phantom Centre
11	3Stereo
12	Prologic
13	Line
14	Custom
15	RF
16	
17	
18	
19	
20	
21	
22	
23	Surround
24	Stereo
25	Mono
26	Phantom Centre
27	3Stereo
28	Prologic
29	Line
30	Custom
31	RF
32	
33	
34	
35	
36	
37	Digital Ground

To Alpha 2nd Remote Card Remote SCSI 1	
pin	function
6,9,12, 15,25,28 ,31,34	Relay 1-8 No
2	Opto 1
3	Opto 2
4	Opto 3
5	Opto 4
7	Relay 1 Com
26	Relay 2 Com
10	Relay 3 Com
29	Relay 4 Com
13	Relay 5 Com
32	Relay 6 Com
16	Relay 7 Com
35	Relay 8 Com
8,11,14, 17,20,21, 22,23,24, 27,30,33	Digital Ground

To Alpha 2nd Remote Card Remote SCSI 2	
pin	function
6	Relay 9 No
2	Opto 5
3	Opto 6
4	Opto 7
5	Opto 8
7	Relay 9 Com
20,21, 22,23, 24	Relay 9 Nm, Opto 5-8 returns

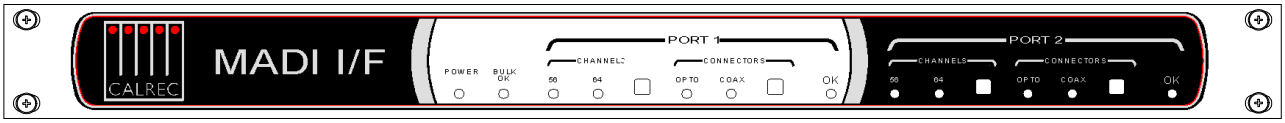




Cable schedule for Dolby DP570 & DP564 remote connection to Calrec Alpha 100													0681-87
Cable No	Cable	Cable	Length	Colours	From				To				Circuit
	Description	Type			Pins	Conn Type	Area	Con. No.	Area	Con. No.	Conn Type	Pins	
1	Alpha Rem1	BEL10 9510	8m	Bk of (Bk/R)	1*	D37MC	Eqpt Bay	GPIO	HN4916-2	J16	SCSI 36M	6 $	Relay 1-8 No (5V)
		310-201		Bk/W	7.8	*Cable Mounting*	Dolby Unit	"	"	"	*Cable Mounting*	2.3	Opto 1 / 2 (Stereo/Mono)
				Bk/G	9.10	*Hood: 420-499*	"	"	"	"	*Hood: 410-156*	4.5	Opto 3 / 4 (Ph centre/3stereo)
				Bk/B	23#..24#	*Insert: 420-496*	"	"	"	"	*Insert: 410-155*	7.26	Relay 1 / 2 Com (Surr/Stereo)
				Bk/Y	25#..26#	"	"	"	"	"	"	10.29	Relay 3 / 4 Com (Mono/Ph centre)
				Bk/Bn	27#..28#	"	"	"	"	"	"	13.32	Relay 5 / 6 Com (3Stereo/Pro logic)
				Bk/O	29#..30#	"	"	"	"	"	"	16.35	Relay 7 / 8 Com (Line/Custom)
				R/W	NC	"	"	"	"	"	"	NC	
				R/G	NC	"	"	"	"	"	"	NC	
				R/B	NC	"	"	"	"	"	"	NC	
				R of (Bk/R)	37*	"	"	"	"	"	"	8 ##	Relay 1-8 Nm Opto Returns
				Scr	Shell*	"	"	"	"	"	"	Shell	Earth
2	Alpha Rem2	BEL5 9505	8m	Bk of (Bk/R)	1*	"	"	"	HN4916-2	J17	SCSI 36M	6	Relay 9 No (5V)
		310-379		Bk/W	11.12	"	"	"	"	"	*Cable Mounting*	2.3	Opto 5 / 6 (Pro logic/Line)
				Bk/G	13.14	"	"	"	"	"	*Hood: 410-156*	4.5	Opto 7 / 8 (Custom/RF)
				Bk of (Bk/B)	31#	"	"	"	"	"	*Insert: 410-155*	7	Relay 9 Com (RF)
				B of (Bk/B)	NC	"	"	"	"	"	"	NC	
				Bk/Y	NC	"	"	"	"	"	"	NC	
				R of (Bk/R)	37*	"	"	"	"	"	"	24 ###	Relay 9 Nm Opto Returns
				Scr	Shell*	"	"	"	"	"	"	Shell	Earth
NOTE													(Dolby Circuits)
	*= shared pin												
	$ Pin 6 also links to pins 9 . 12 . 15 . 25 . 28 . 31 . 34												
	# Each pin (23 to 31) separately needs a 330R 0.25W Resistor (080-331) in series with the wire (9 resistors in total)												
	## Pin 8 also links to pins 11 . 14 . 17 . 20 . 21 . 22 . 23 . 24 . 27 . 30 . 33												
	### Pin 24 also links to pins 20 . 21 . 22 . 23												
	DG = Digital Ground												
	NC = No Connection, tie back												
Note: Also see drawing 920-605													
Note: This fully isolates the two systems. The original test cable did not because the opto returns were not used.													Run No. 1 - 1
Note: Wires shown here on pins 7-14 of D37 were connected to pins 8-15 on issue 1 schedule. Dolby box setup would be different for issue 1 cable													Cable Description:
	Issue 2 cable is in line with default Dolby pin allocation												Dolby Remotes Issue 2

OPTIONAL I/O EXPANSION VIA WIDE AREA INTERFACES

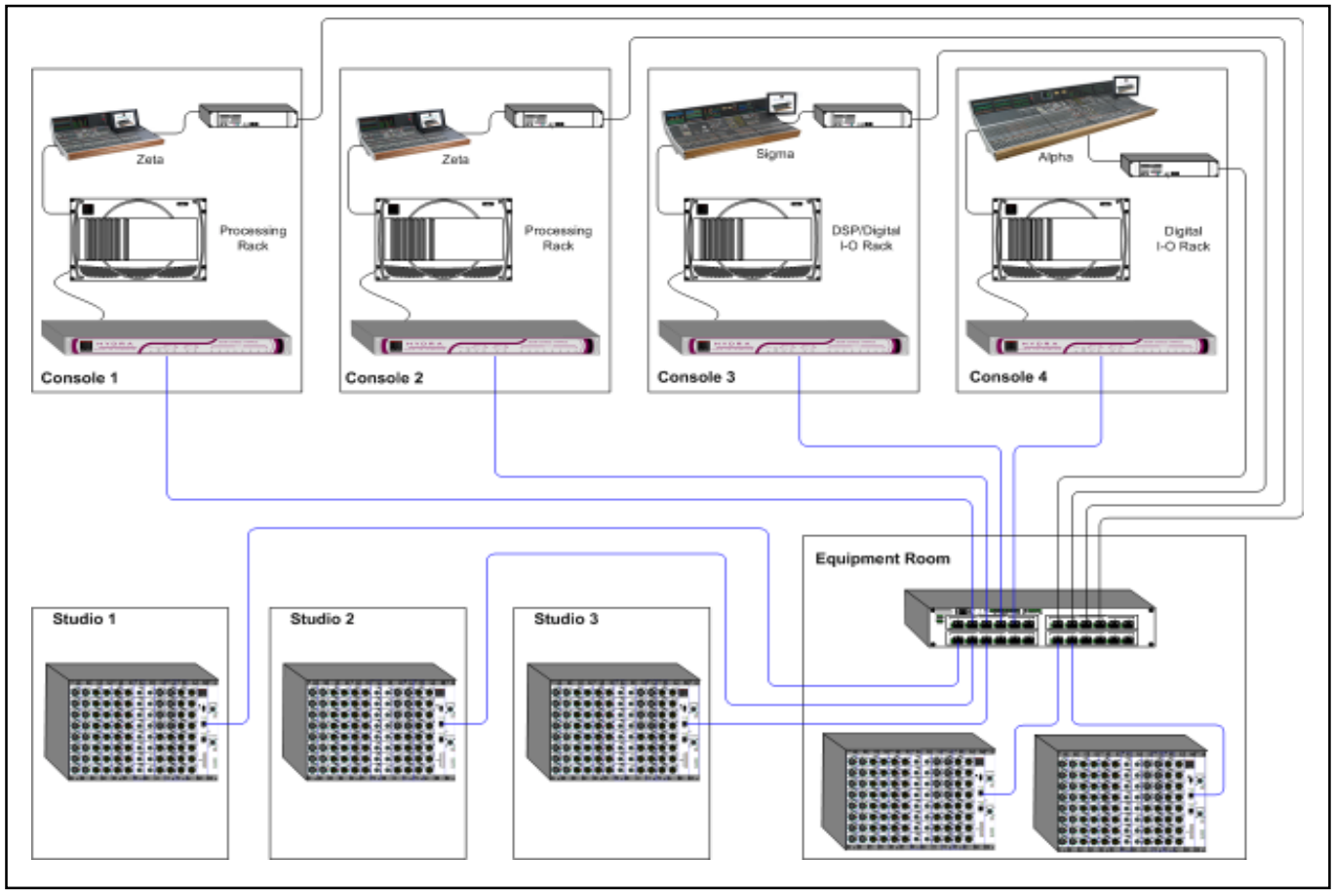
MADI



The rack mounted MADI unit contains two independent AES10 MADI compatible interfaces, and is available as an option. The two ports are interfaced to the console via a Wide Area Bulk (WAB) card, which occupies one of the AES card slots in the DSP/Digital I/O rack. Each MADI interface can operate in either 56 or 64 channel mode and can transmit over a coaxial AND optical medium and receive over a coaxial OR optical medium. A switch allows receiver selection. There is no sample rate conversion available on MADI inputs or outputs therefore, all the equipment connected via MADI must be synchronised to the same source as the console.

HYDRA

The Hydra audio networking system provides a powerful network for sharing of I/O resources and control data between Calrec digital consoles. Remote I/O units, with up to 96 inputs/outputs, analogue or digital, may be connected onto the network, providing remotely located sources and destinations that can be used by any or all mixing consoles. The console interfaces to the Hydra gigabit interface unit shown above, via a Wide Area Bulk (WAB) card, which occupies one of the AES card slots in the DSP/Digital I/O rack.



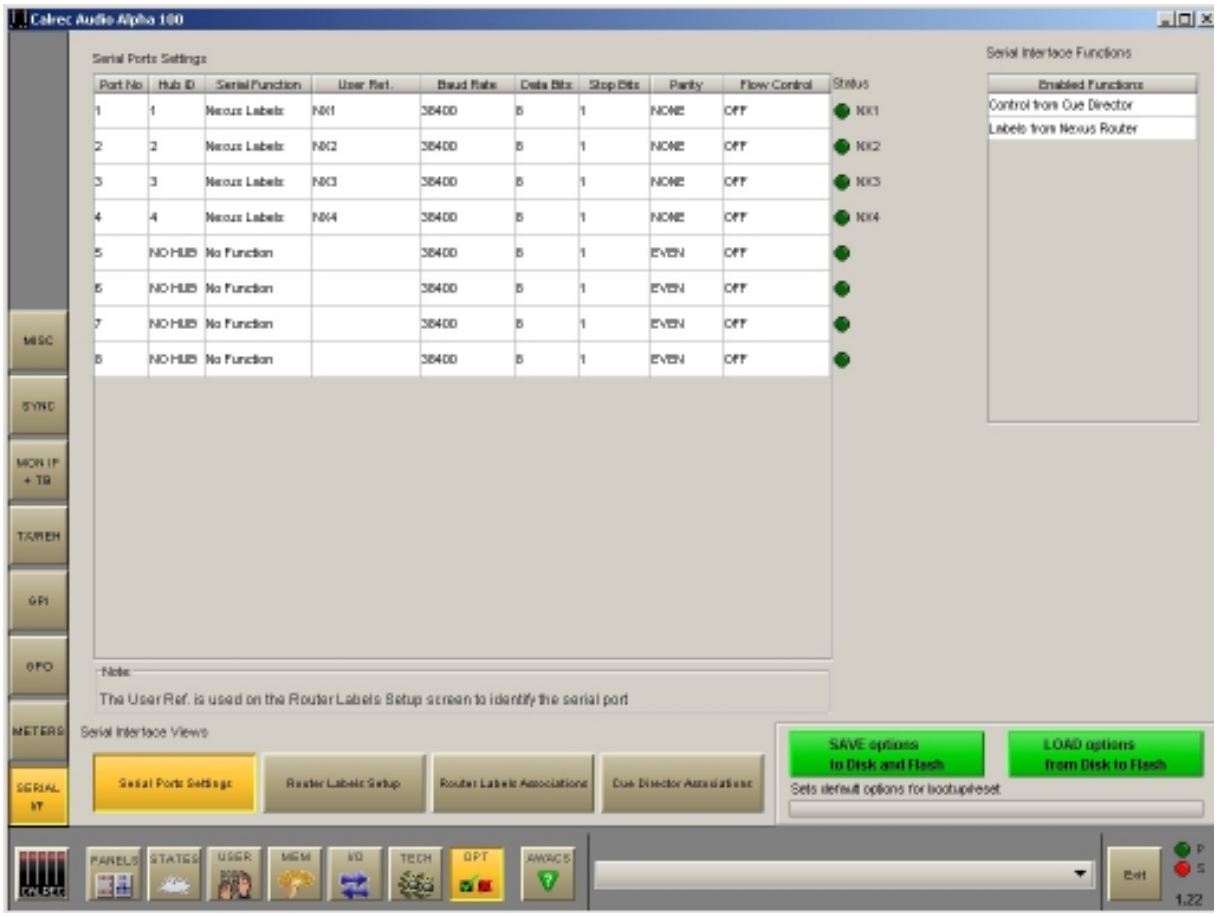
SERIAL INTERFACE

The console can have up to 8 hub cards, each of which can have a serial interface port for allowing equipment to be connected to the system. The system currently supports the following serial interfaces:

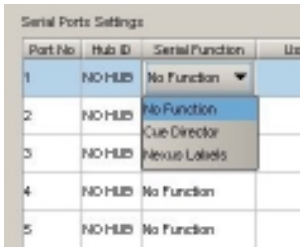
- Cue Director
- Nexus Router
- TSI Image Video 1000

Serial port setup and label associations are made using the Options-Serial I/F screens.

Serial Port Settings Screen



The Serial Port Settings screen is used to tell the system what information it should receive from each serial interface port, by allocating a function to each from the Serial Function column. Only the serial functions which are enabled for the console will be available for selection.

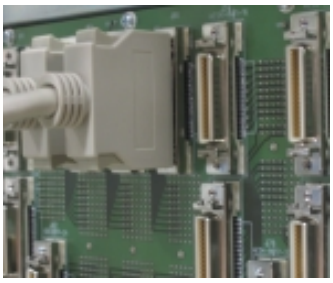


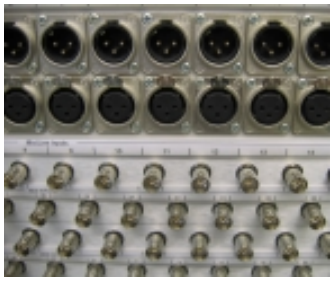
The Hub ID number is also selectable from a drop down list. The ability to change the Hub ID number is useful for the situation where two routers are connected to the console, sending the same information. If one router or serial port fails the serial function can be moved from one hub to another.

The function can be given a name by typing up to six characters in the USER REF column.

For each function there is an indicator which flashes when a valid message is received from the user serial port.

Wiring and Cabling Information



CONSOLE AND RACK WIIRNG DIAGRAM

MAXIMUM CABLE LENGTHS

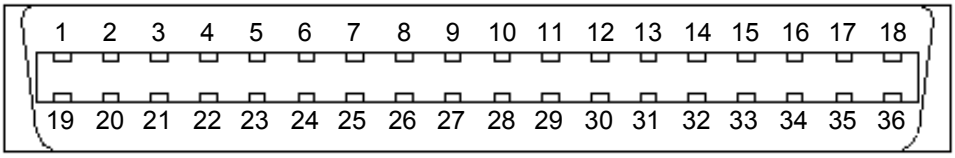
Cables from	To	Maximum length	
		feet	metres
Control surface	Control Surface Bulk PSU	100.0	30.0
Control surface	PC	500.0	150.0
Control surface *	DSP/Digital I/O Rack *	100.0	30.0
PC	DSP/Digital I/O Rack	100.0	30.0
DSP/Digital I/O Rack	Racks Bulk PSU	100.0	30.0
DSP/Digital I/O Rack	Analogue I/O Rack	33.0	10.0
DSP/Digital I/O Rack	BNC/XLR I/O Interface Panels	9.8	3
Analogue I/O Rack	EDAC I/O Interface Panels	9.8	3
Analogue I/O Rack	Multi-Rail PSU	33.0	10.0
Multi-Rail PSU	Multi-Rail PSU	1.3	0.4
MADI Unit	DSP/Digital I/O Rack	16.5	5
Hydra Unit	DSP/Digital I/O Rack	16.5	5

Power monitor rack cables are limited by other cable lengths.

* Extenders can be supplied to provide console data connections up to 150 metres (500 feet) at an additional cost.

SPECIFICATION FOR SCSI STYLE CABLING

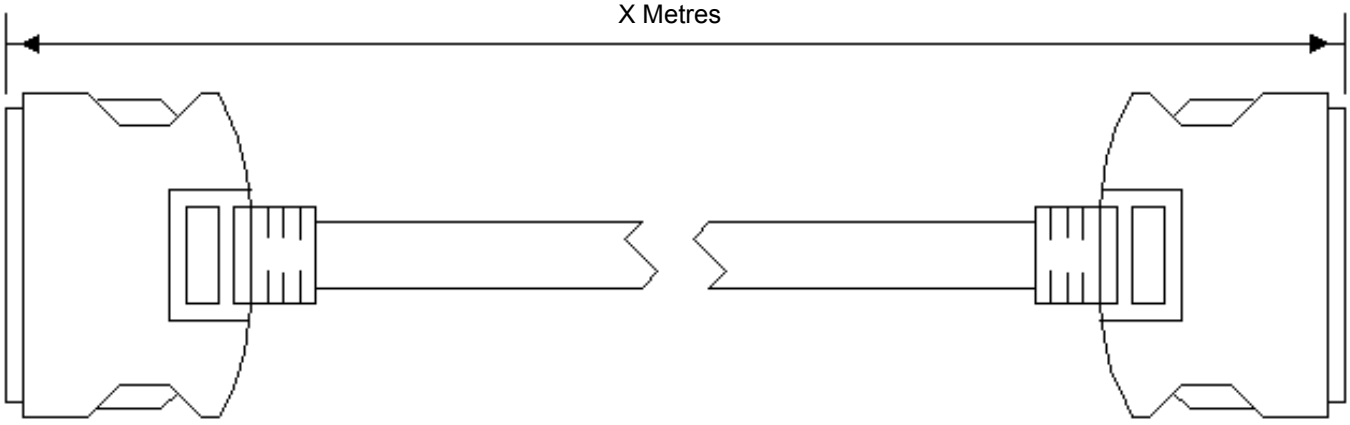
FRONT VIEW OF MATING CONNECTOR



EITHER 3M 10236-55G3VC R/A THROUGH HOLE,
OR 3M 10236-2200VE VERTICAL SMT,
OR EQUIVALENTS

CABLE PAIRS WIRED AS:
1 . 19
2 . 20
3 . 21
4 . 22
5 . 23
6 . 24
7 . 25
8 . 26
9 . 27
10 . 28
11 . 29
12 . 30
13 . 31
14 . 32
15 . 33
16 . 34
17 . 35
18 . 36

- 18 PAIR 28 AWG CABLE
- UL APPROVED MATERIALS
- FULLY SCREENED



36W MDR PLUG
3M10136-6000EL
OR EQUIVALENT

36W SHIELDED COVER
3M 103336-3210-00
OR EQUIVALENT

STOCK CODES

312-079	1M
312-078	3M
312-077	5M

CATEGORY 5E AND CATEGORY 6 CABLES

The same installation practises generally apply for both category 5e and category 6 cabling. However, as category 6 cables have such a demanding performance criterion, they are less forgiving in the quality of the installation. Cable manufacturers strongly recommend adhering closely to the installation practises outlined for their cable specification.

Some important issues to consider during installation:

Do not exceed the cable manufacturer's specified cable pulling tension and avoid sharp bends in the cable, as it will alter the lay of the pairs within it. Cable manufacturers recommend that cable bend radius should be no less than 4 times the diameter of the cable (post installation). The minimum cable bend radius during installation is 8 times the cable diameter. In practise, this means that where a 25mm radius would be appropriate within a rack, the conduit leading to it would require minimum bends of 50mm radius.

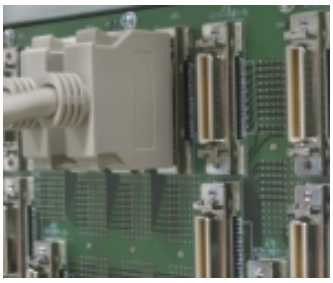
Avoid compressing the cables by over-tightening any cable ties (tie-wraps). This problem is most likely to occur in large bundles of cables, where the cables on the outside of the bundle are exposed to more compression than those on the inside. Over-tightening deforms the twisted pairs within the cable, and can affect their performance. The cable ties should only be tight enough to sufficiently support the cable bundle, and not to deform the outer cable sleeve/jacket. One solution can be to use the hook and loop (Velcro) cable ties. When any number of cables are bundled together in long parallel lengths, the capacitive coupling of pairs in different cables in the bundle with the same twist rates can cause cross-talk interference to increase. The best way to avoid this is to minimise the length of long parallel runs, and to install cables as they lie rather than trying to straighten them out into perfectly aligned bundles.

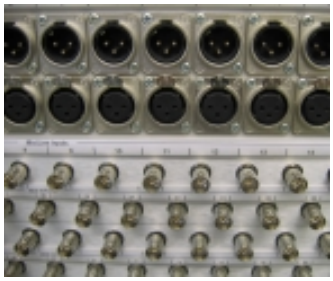
When pulling cables from the reels, be conscious of the occasional tendency of the cable to kink. If the cable kinks, it should be regarded as damaged, and replaced. Do not try to straighten the kink out of the cable.

At the point of cable termination, remove only the minimum amount of cable sleeve/jacket. This ensures that the twist rate and lay of the core pairs within the cable are maintained for as much of the transmission path as possible. The twist rate of each pair of cable cores should also be maintained to as close as possible to point of termination within the connector.

These are general rules to follow, and if in doubt, always refer to the cable manufacturer's recommendations.

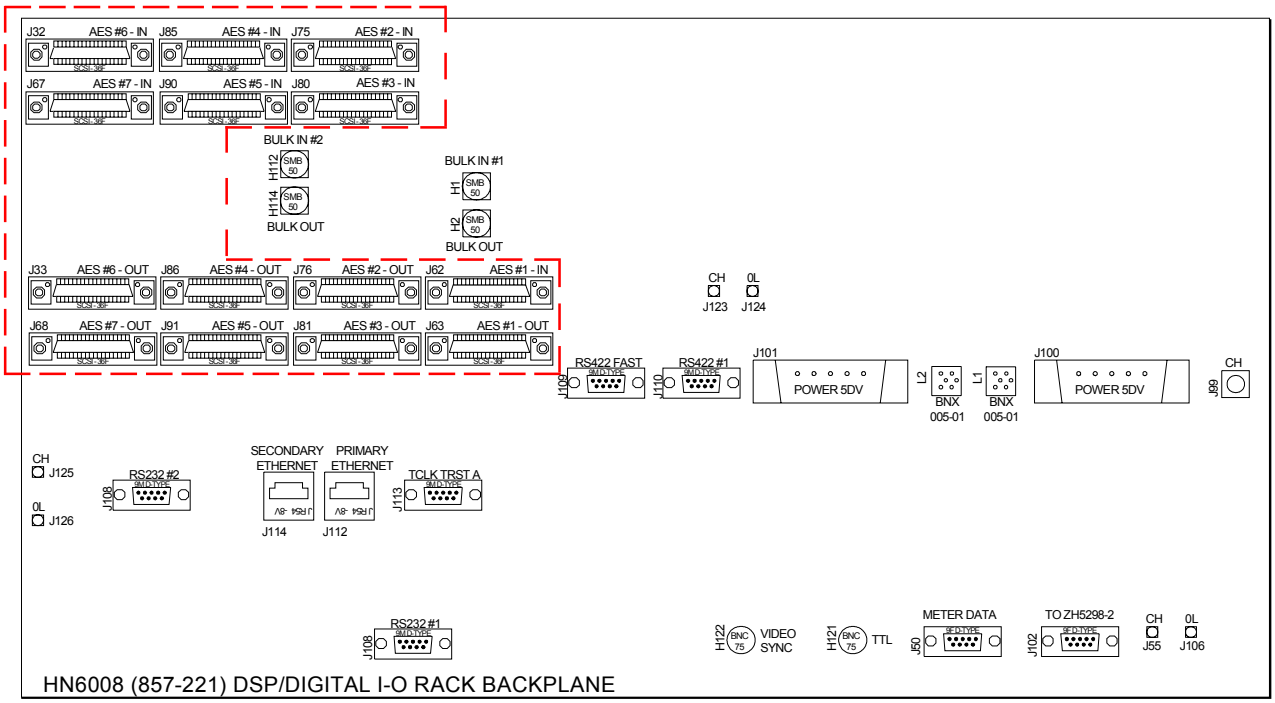
Audio Input and Output Interfaces



AES INPUTS AND OUTPUTS

Slots in the DSP/Digital I/O Rack are numbered 0 to 20. Slots 0 to 13 are allocated for DSP cards and control processor cards. Slots 14 to 20 are allocated for AES I/O, Bulk I/O or Wide Area Bulk I/O cards. There can be up to 7 AES I/O cards in the system, each of which provides 16 AES inputs and 16 AES outputs.



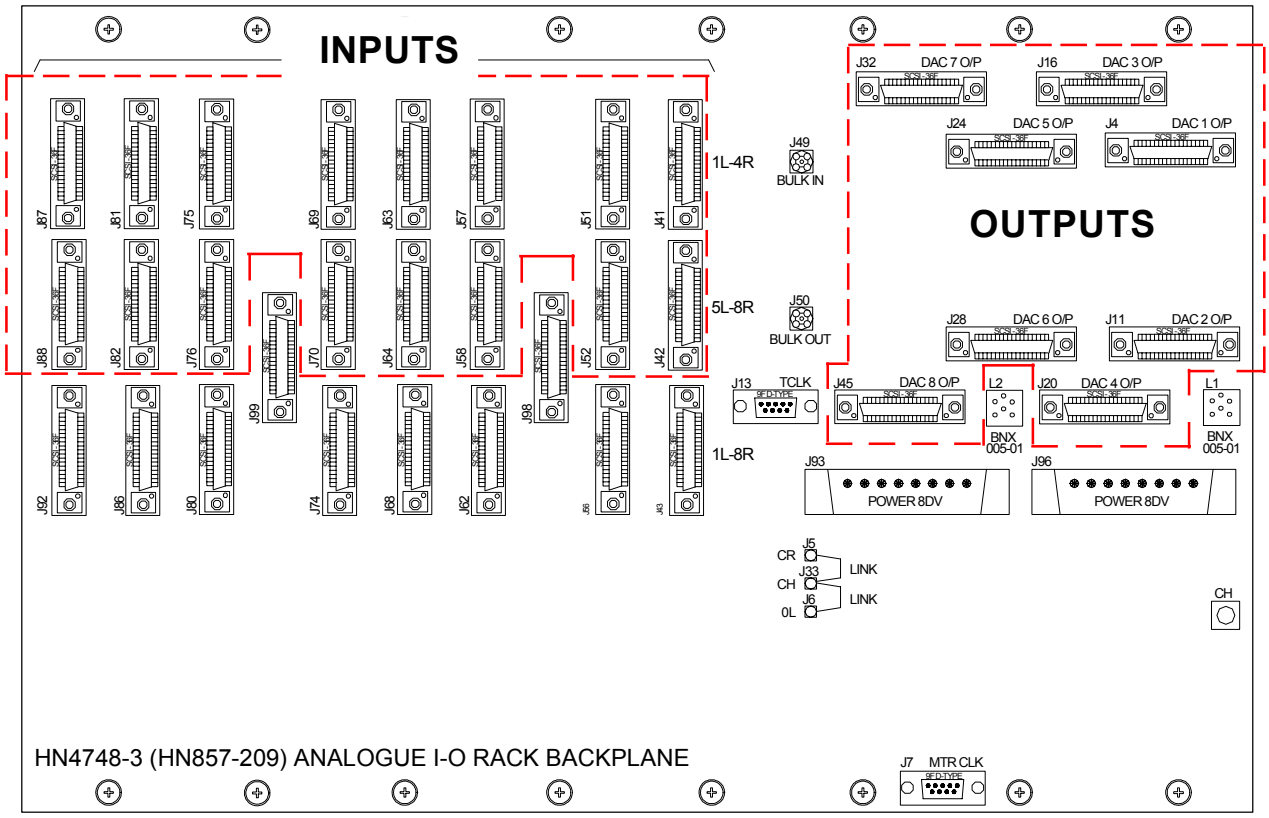
Each slot has dedicated input and output connectors on the rear of the rack (shown within dotted border), to which the system's AES inputs and outputs are interfaced. Each connector interfaces 16 AES pairs of inputs or outputs.These connectors are 36 way female SCSI-style, and are used only when an AES I/O card occupies the slot.

Of the 7 AES slots available, up to 3 can be occupied by bulk I/O or wide area bulk I/O (WAB) cards, which are used to interface to Analogue I/O Racks, or wide area interfaces (MADI or Hydra) respectively. There can be up to 2 analogue racks in the system. If a slot is occupied by a bulk I/O or a WAB I/O card, then the AES I/O connectors on the rear of the DSP/Digital I/O Rack belonging to that slot are left unused. Instead, the SMB connectors for bulk I/O are used to connect to the equipment being interfaced.

SLOT	COMPATIBLE I/O CARD	AES INPUT CONNECTOR	AES OUTPUT CONNECTOR
14	AES, BULK OR WAB	J62	J63
15	AES	J75	J76
16	AES, BULK OR WAB	J80	J81
17	AES	J85	J86
18	AES, BULK OR WAB	J90	J91
19	AES	J32	J33
20	AES	J67	J68

ANALOGUE INPUTS AND OUTPUTS

All analogue inputs and outputs are provided on 36 way female SCSI-style connectors on the rear of the Analogue I/O Racks (4 pairs of inputs or 8 pairs of outputs per connector). There can be up to 2 Analogue I/O Racks in the system.



ADC Card Slots and Connectors

Each analogue I/O Rack can house up to 8 mic/line or line input (ADC) cards, each of which provides 8 stereo inputs. The cards are inserted into the slots within the rack, these are numbered 1-8. Each slot has 2 dedicated input connectors on the rear of the rack, to which the system's analogue inputs are connected. Each of the input connectors provides connections for 4 stereo inputs.

ADC SLOT	MIC/LINE INPUTS 1-8 CONNECTOR	MIC/LINE INPUTS 9-16 CONNECTOR
1	J41	J42
2	J51	J52
3	J57	J58
4	J63	J64
5	J69	J70
6	J75	J76
7	J81	J82
8	J87	J88

DAC SLOT	LINE OUTPUTS 1-16 CONNECTOR
1	J4
2	J11
3	J16
4	J20
5	J24
6	J28
7	J32
8	J45

DAC Card Slots and Connectors

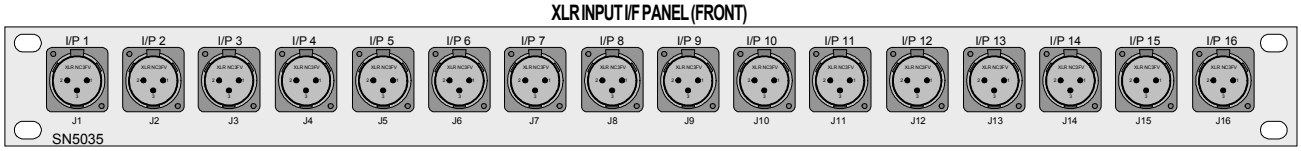
In addition, each analogue I/O Rack can house up to 8 line output (DAC) cards, each of which provides 8 stereo outputs. The cards are inserted into the slots within the rack, these are numbered 1-8. Each slot has a dedicated output connector on the rear of the rack, which provide connections for the system's analogue outputs. Each of the output connectors provides connections for 8 stereo outputs.

BNC AND XLR INTERFACE CONNECTOR PANELS

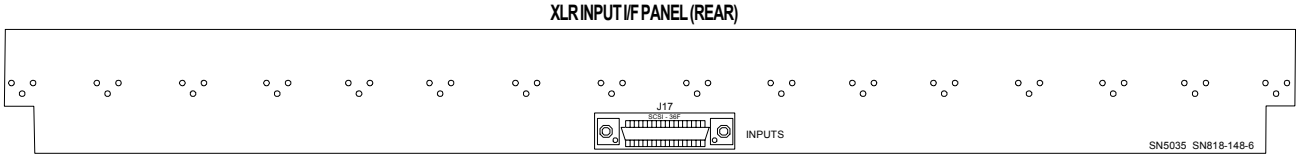
Audio inputs and outputs may be connected directly to the console using 36 way SCSI-style mating connectors. Optionally, break out connector panels and cabling can be provided. Please note that interface panels must be fitted within 3m (9.8ft) of the backplane they connect to.

For Digital I/O, either XLR (16 male or female on a 1U panel) or BNC (32 on a 1U panel).

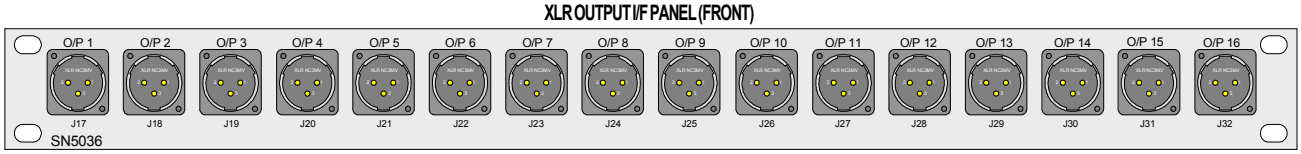
XLR INPUT I/F PANEL (FRONT)



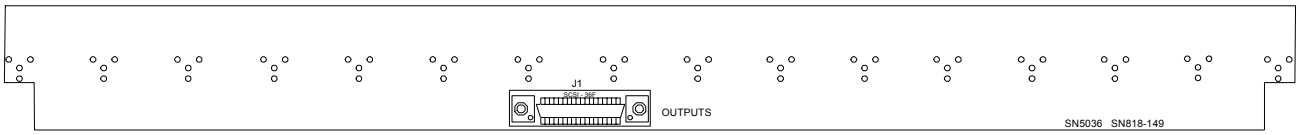
XLR INPUT I/F PANEL (REAR)



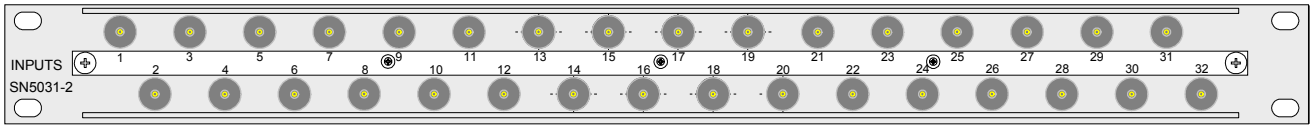
XLR OUTPUT I/F PANEL (FRONT)



XLR OUTPUT I/F PANEL (REAR)

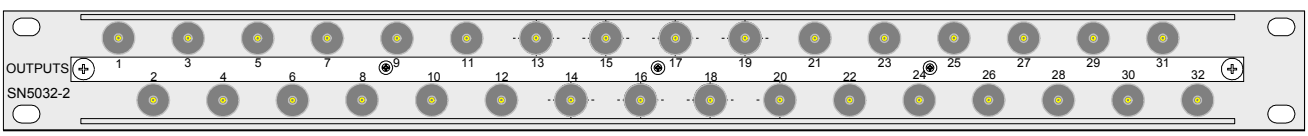


BNC INPUT I/F PANEL (FRONT)

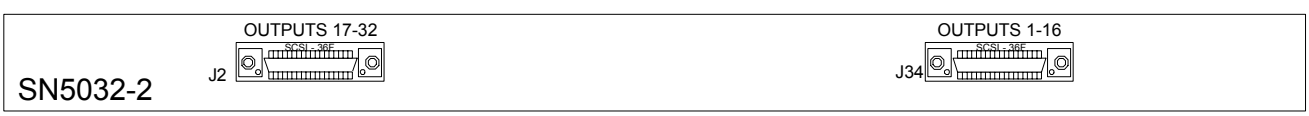


BNC INPUT I/F PANEL (REAR)

BNC OUTPUT I/F PANEL (FRONT)



BNC OUTPUT I/F PANEL (REAR)



EDAC INTERFACE CONNECTOR PANELS

8 or 12 way EDAC connector 2U panels are available to interface analogue I/O in one of the following styles:

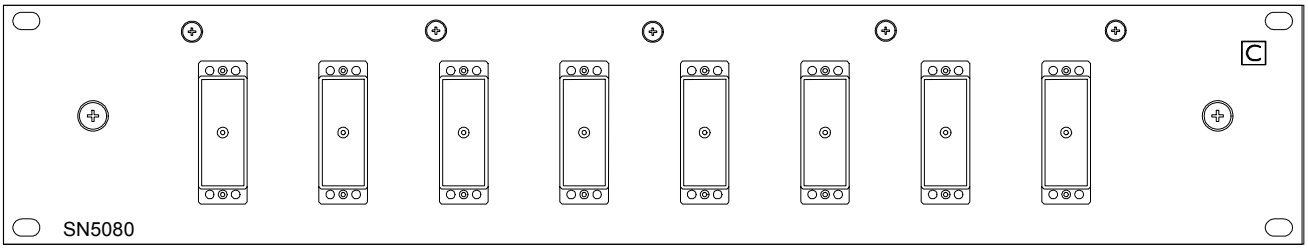
Interface	Style 1	Style 2
Mic/Line or Line Inputs	4 pairs per EDAC	6 pairs per EDAC
Line Only Inputs	8 pairs per EDAC	6 pairs per EDAC
Line Outputs	8 pairs per EDAC	6 pairs per EDAC

The choice of style will depend on the installation requirements. Limiting factors to be considered are:

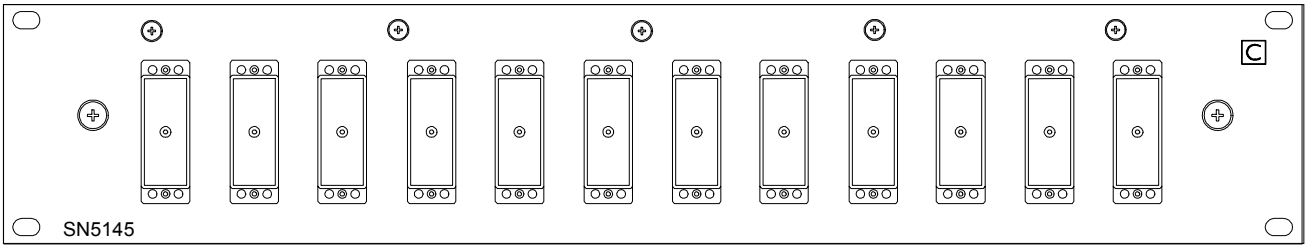
- The number of connections available in the external cabling
- Restricted amount of interface space available within 3m(9.8ft) of the backplane.

The different styles are achieved using interface cards which attach to the rear of the 2U panels to provide different combinations of SCSI-style connectors per EDAC (Except in the case of mic/line inputs where a custom cable is provided).

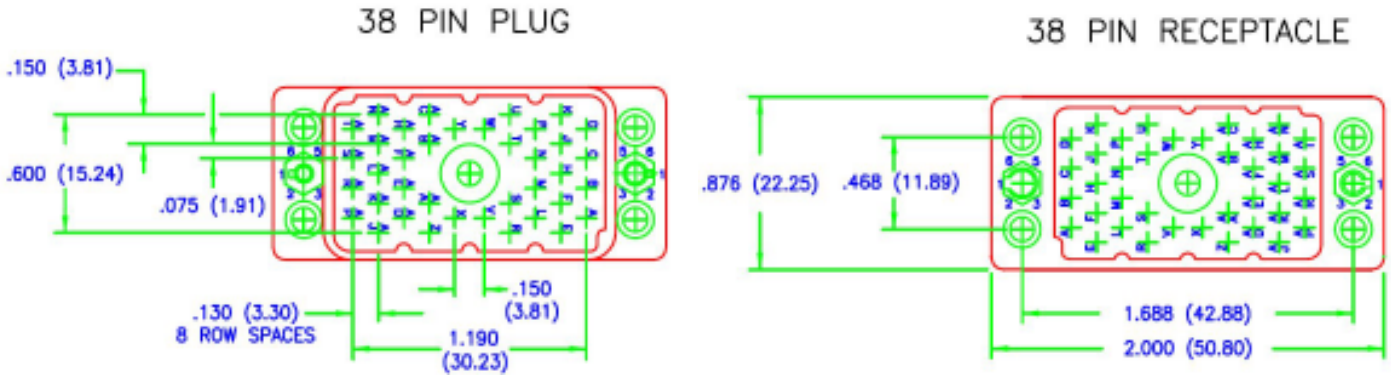
8X38W EDAC PANEL



12X38W EDAC PANEL

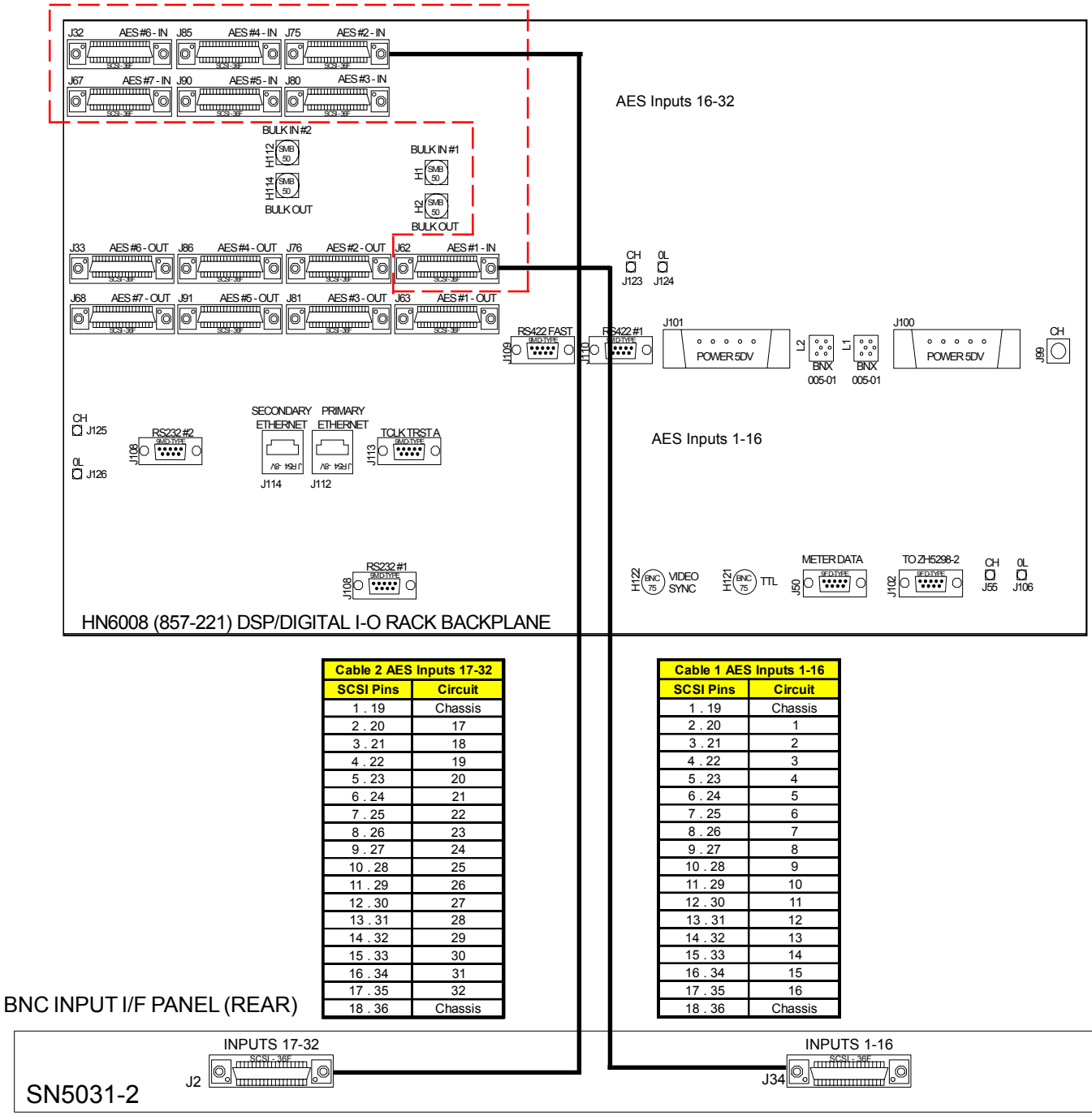


The connectors on these panels are 38 pin, male panel-mounted EDAC connectors (38MP-plug). Therefore, cables interfacing to these panels need 38 pin, female cabling connectors (38FC-receptacle).



AES INPUTS - BNC INTERFACE

Each AES I/O card in the DSP/Digital I/O Rack provides 16 AES inputs and 16 AES outputs. Each slot has dedicated input and output connectors on the rear of the rack, to which the system's AES inputs and outputs are connected. The diagram below shows how the AES input connectors (shown within dotted border) are connected to BNC interface panels via SCSI-style cabling. For clarity, input connections from just 2 AES cards (occupying slots 14 and 15) to an interface panel are shown here.



Cable 2 AES Inputs 17-32	
SCSI Pins	Circuit
1 . 19	Chassis
2 . 20	17
3 . 21	18
4 . 22	19
5 . 23	20
6 . 24	21
7 . 25	22
8 . 26	23
9 . 27	24
10 . 28	25
11 . 29	26
12 . 30	27
13 . 31	28
14 . 32	29
15 . 33	30
16 . 34	31
17 . 35	32
18 . 36	Chassis

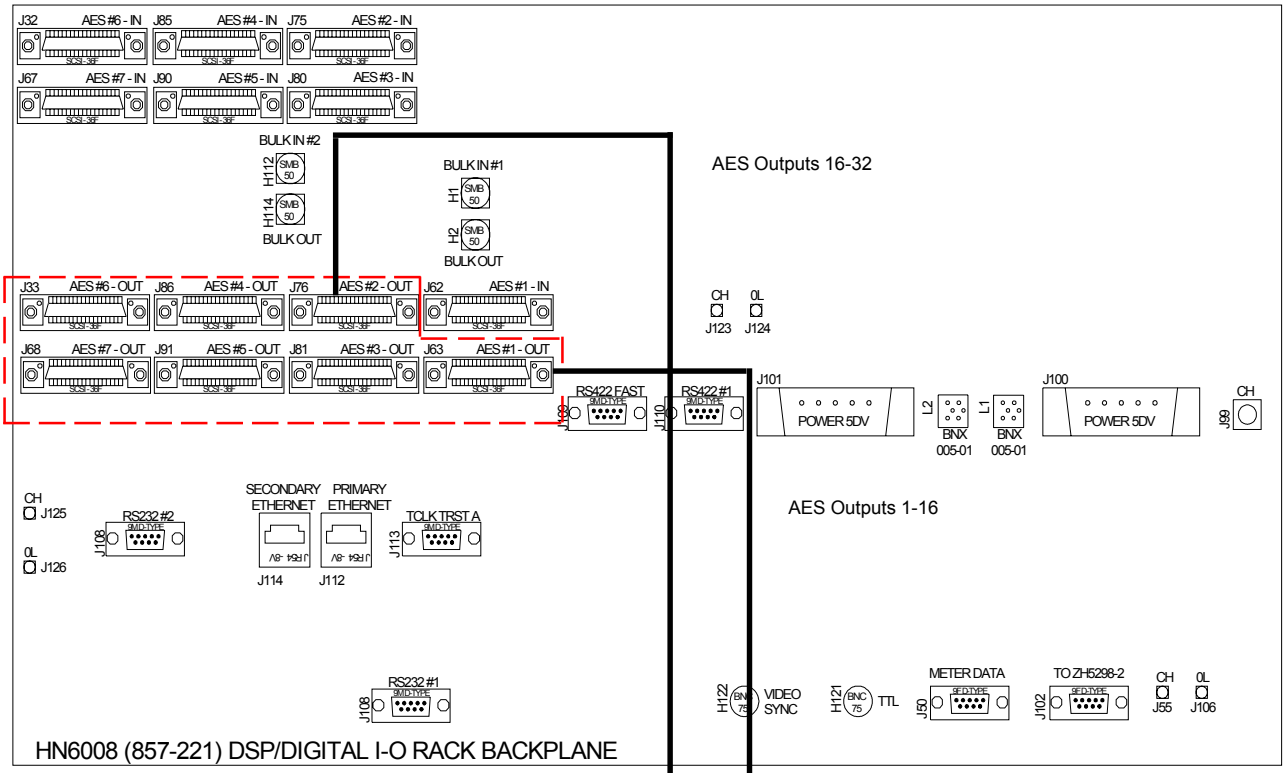
Cable 1 AES Inputs 1-16	
SCSI Pins	Circuit
1 . 19	Chassis
2 . 20	1
3 . 21	2
4 . 22	3
5 . 23	4
6 . 24	5
7 . 25	6
8 . 26	7
9 . 27	8
10 . 28	9
11 . 29	10
12 . 30	11
13 . 31	12
14 . 32	13
15 . 33	14
16 . 34	15
17 . 35	16
18 . 36	Chassis

Ideally, the BNC input interface panels should be located within 3m (9.8ft) of the DSP/Digital I/O rack. Each panel can interface 32 AES inputs. Therefore if all AES inputs are used, 3 panels would be needed.

Please Note:
AES inputs 1-16 are available on connector J62, provided that the card in slot 14 is an AES I/O card. If a Bulk I/O or WAB I/O card occupies slot 14, then AES inputs 1-16 will be available on connector J75, using the AES card in slot 15. The AES I/O connectors belonging to slots that are occupied by bulk I/O or WAB I/O cards are left unused. Slots 14, 16 and 18 can be occupied by Bulk I/O or WAB I/O cards.

AES OUTPUTS - BNC INTERFACE

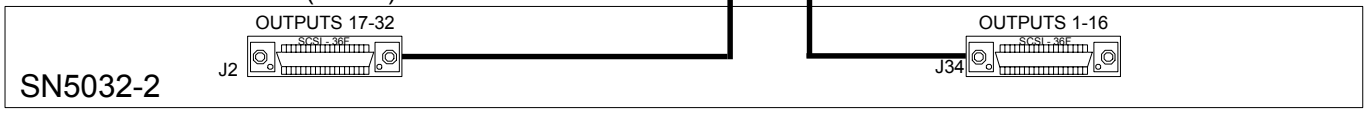
Each AES I/O card in the Digital I/O Rack provides 16 AES inputs and 16 AES outputs. Each slot has dedicated input and output connectors on the rear of the rack, to which the system's AES inputs and outputs are connected. The diagram below shows how the AES output connectors (shown within dotted border) are connected to BNC interface panels via SCSI-style cabling. For clarity, output connections from just 2 AES cards (occupying slots 14 and 15) to an interface panel are shown here.



Cable 2 AES Outputs 17-32	
SCSI Pins	Circuit
1 . 19	Chassis
2 . 20	17
3 . 21	18
4 . 22	19
5 . 23	20
6 . 24	21
7 . 25	22
8 . 26	23
9 . 27	24
10 . 28	25
11 . 29	26
12 . 30	27
13 . 31	28
14 . 32	29
15 . 33	30
16 . 34	31
17 . 35	32
18 . 36	Chassis

Cable 1 AES Outputs 1-16	
SCSI Pins	Circuit
1 . 19	Chassis
2 . 20	1
3 . 21	2
4 . 22	3
5 . 23	4
6 . 24	5
7 . 25	6
8 . 26	7
9 . 27	8
10 . 28	9
11 . 29	10
12 . 30	11
13 . 31	12
14 . 32	13
15 . 33	14
16 . 34	15
17 . 35	16
18 . 36	Chassis

BNC OUTPUT I/F PANEL (REAR)

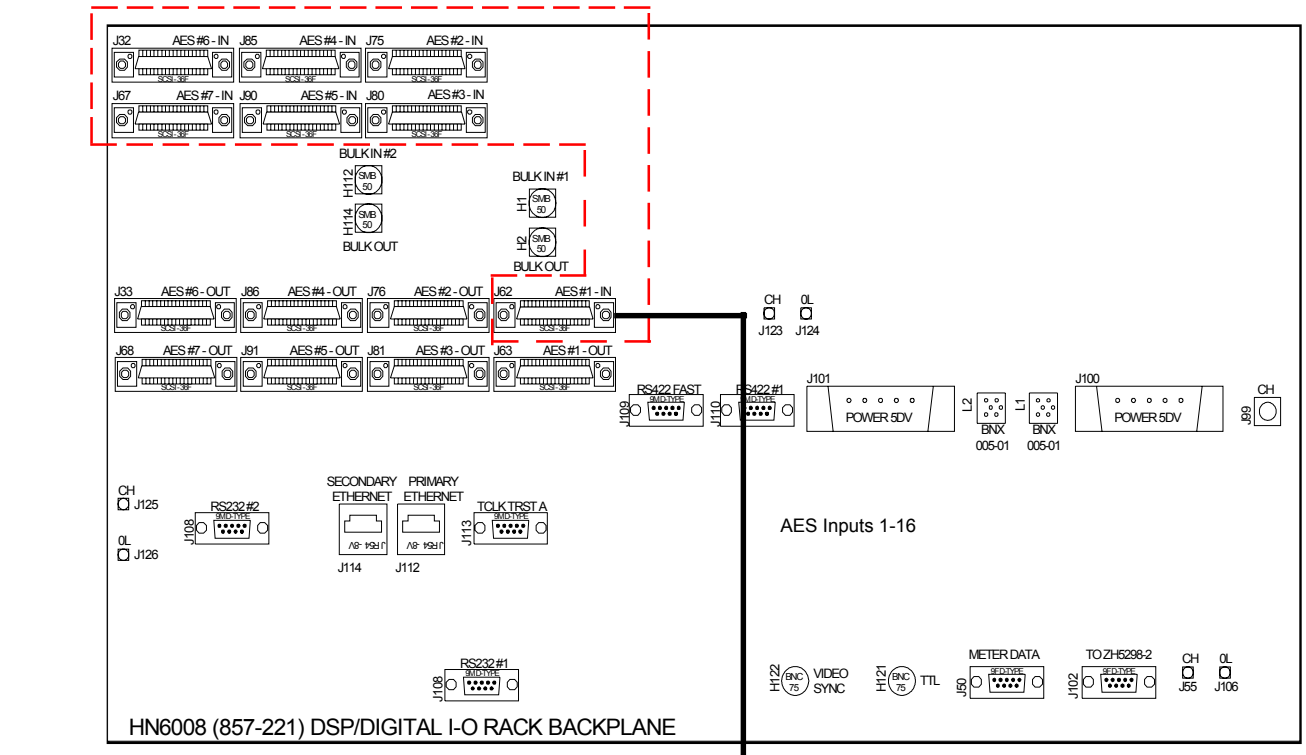


Ideally, the BNC output interface panels should be located within 3m (9.8ft) of the Digital I/O rack. Each panel can interface 32 AES outputs. Therefore if all AES outputs are used, 3 panels would be needed.

Please Note:
AES outputs 1-16 are available on connector J63, provided that the card in slot 14 is an AES I/O card. If a Bulk I/O or WAB I/O card occupies slot 10, then AES outputs 1-16 will be available on connector J76, using the AES card in slot 15. The AES I/O connectors belonging to slots that are occupied by bulk I/O or WAB I/O cards are left unused. Slots 14, 16 and 18 can be occupied by bulk I/O or WAB I/O cards.

AES INPUTS - XLR INTERFACE

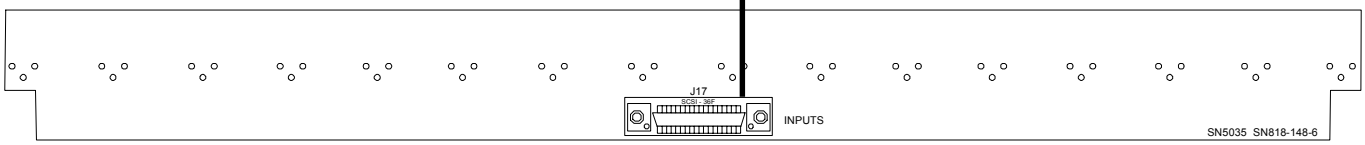
Each AES I/O card in the Digital I/O Rack provides 16 AES inputs and 16 AES outputs. Each slot has dedicated input and output connectors on the rear of the rack, to which the system's AES inputs and outputs are connected. The diagram below shows how the AES input connectors (shown within dotted border) are connected to XLR interface panels via SCSI-style cabling. For clarity, connection from just one AES card (occupying slot 14) to an interface panel is shown here.



On 3 pin XLR, pin 2 is HOT (phase), pin 3 is COLD (anti-phase) and pin 1 is chassis connections.

Cable 1 AES Inputs 1-16	
SCSI Pins	**Circuit**
1 . 19	Chassis
2 . 20	1
3 . 21	2
4 . 22	3
5 . 23	4
6 . 24	5
7 . 25	6
8 . 26	7
9 . 27	8
10 . 28	9
11 . 29	10
12 . 30	11
13 . 31	12
14 . 32	13
15 . 33	14
16 . 34	15
17 . 35	16
18 . 36	Chassis

XLR INPUT I/F PANEL (REAR)

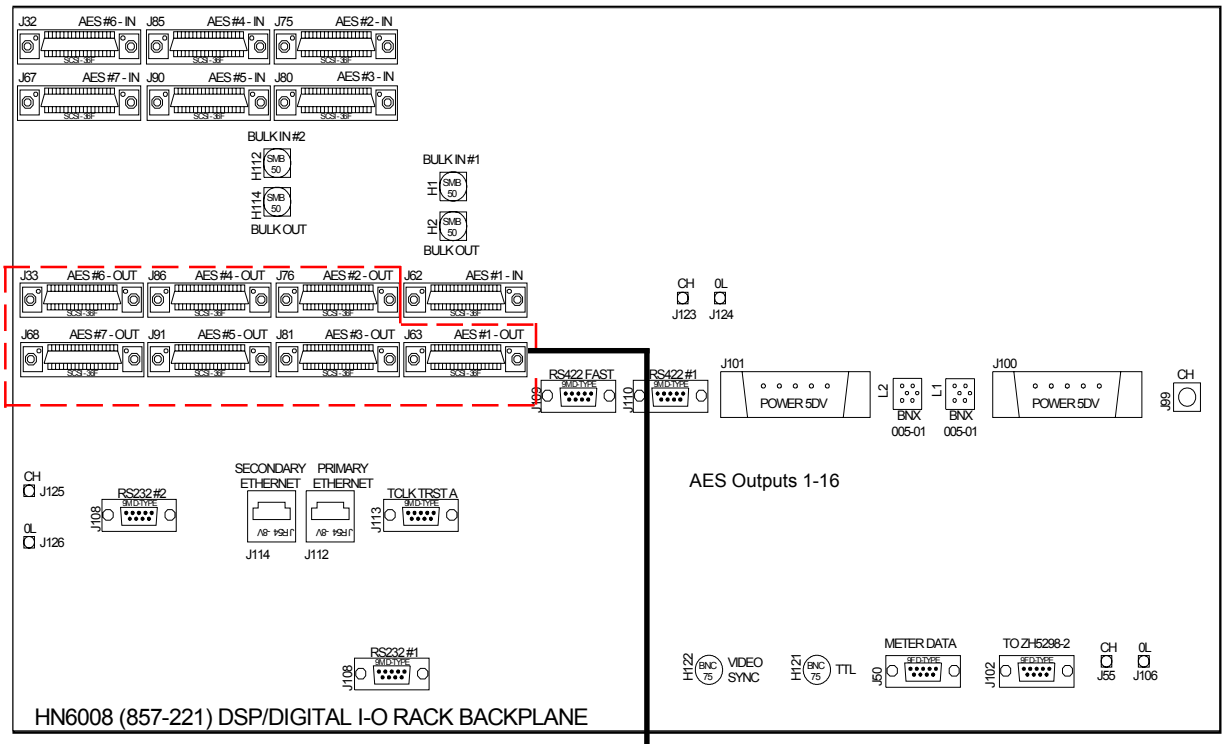


Ideally, the XLR input interface panels should be located within 3m (9.8ft) of the Digital I/O Rack. Each panel can interface 16 AES inputs. Therefore if all AES inputs are used, 6 panels would be needed.

Please Note:
AES inputs 1-16 are available on connector J62, provided that the card in slot 14 is an AES I/O card. If a Bulk I/O or WAB I/O card occupies slot 14, then AES inputs 1-16 will be available on connector J75, using the AES card in slot 15. The AES I/O connectors belonging to slots that are occupied by bulk I/O or WAB I/O cards are left unused. Slots 14, 16 and 18 can be occupied by Bulk I/O or WAB I/O cards.

AES OUTPUTS - XLR INTERFACE

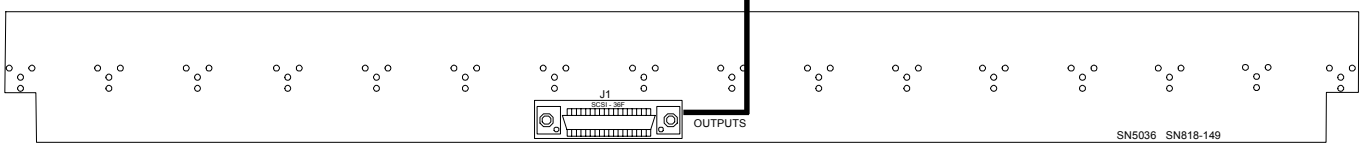
Each AES I/O card in the Digital I/O Rack provides 16 AES inputs and 16 AES outputs. Each slot has dedicated input and output connectors on the rear of the rack, to which the system's AES inputs and outputs are connected. The diagram below shows how the AES output connectors (shown within dotted border) are connected to XLR interface panels via SCSI-style cabling. For clarity, connection from just one AES card (occupying slot 14) to an interface panel is shown here.



On 3 pin XLR, pin 2 is HOT (phase), pin 3 is COLD (anti-phase) and pin 1 is chassis connections.

Cable 1 AES Outputs 1-16	
SCSI Pins	Circuit
1 . 19	Chassis
2 . 20	1
3 . 21	2
4 . 22	3
5 . 23	4
6 . 24	5
7 . 25	6
8 . 26	7
9 . 27	8
10 . 28	9
11 . 29	10
12 . 30	11
13 . 31	12
14 . 32	13
15 . 33	14
16 . 34	15
17 . 35	16
18 . 36	Chassis

XLR OUTPUT I/F PANEL (REAR)



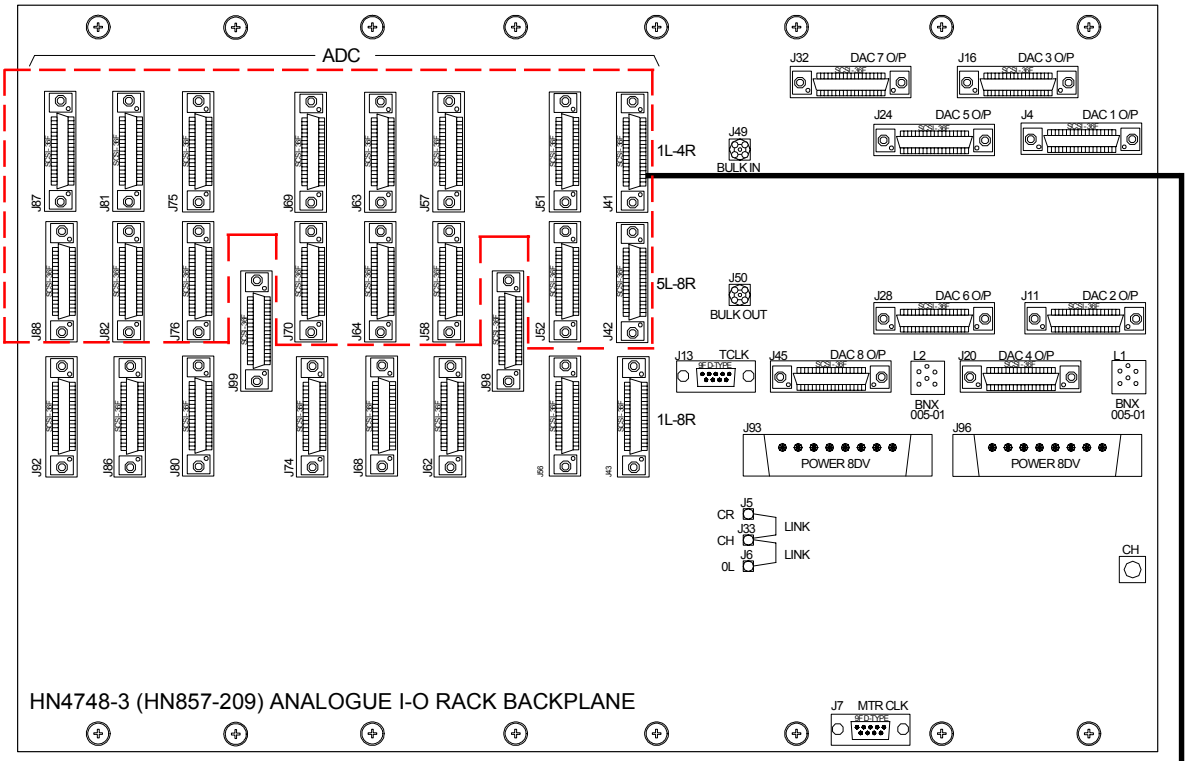
Ideally, the XLR output interface panels should be located within 3m (9.8ft) of the Digital I/O Rack. Each panel can interface 16 AES outputs. Therefore if all AES outputs are used, 6 panels would be needed.

Please Note:
AES outputs 1-16 are available on connector J63, provided that the card in slot 14 is an AES I/O card. If a Bulk I/O or WAB I/O card occupies slot 14, then AES outputs 1-16 will be available on connector J76, using the AES card in slot 15. The AES I/O connectors belonging to slots that are occupied by bulk I/O or WAB I/O cards are left unused. Slots 14, 16 and 18 can be occupied by bulk I/O or WAB I/O cards.

ANALOGUE MIC/LINE INPUTS (MIC/LINE OR LINE ADC CARDS) - STYLE 1

Each Analogue I/O Rack can house up to 8 mic/line or line input (ADC) cards, each of which provides 8 stereo inputs. The cards are inserted into the slots within the rack, and each slot has 2 dedicated input connectors on the rear of the rack (shown within dotted border), to which the system's analogue inputs are connected. Each of the input connectors provides connections for 4 stereo inputs.

The diagram below shows how these connectors are connected to 8 or 12 way EDAC interface panels via Calrec custom cabling to achieve Style 1 (4 pairs per EDAC connector).



Calrec Custom Cabling

Wired into EDAC - Rear of Interface Panel

A.E (B)	Mic/Line IP 1L (screen)
D.K (C)	Mic/Line IP 1R (screen)
L.R (M)	Mic/Line IP 2L (screen)
P.U (N)	Mic/Line IP 2R (screen)
Z.DD (AA)	Mic/Line IP 3L (screen)
CC.HH (BB)	Mic/Line IP 3R (screen)
JJ.PP (KK)	Mic/Line IP 4L (screen)
NN.TT (MM)	Mic/Line IP 4R (screen)
F.J.S.T.H.LL EE.FF.RR.SS	Chassis

Style 1 - 4 pairs per 38 way EDAC

Stereo I/Ps 1-4

(CABLE 2 IS NOT SHOWN)

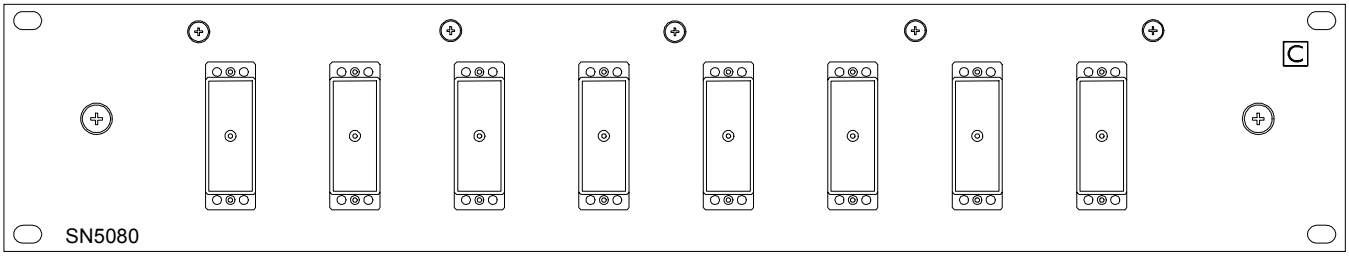
Cable 1 Stereo Inputs 1-4	
SCSI Pins	Circuit
1 . 19	Chassis
2 . 20	1L
3 . 21	Chassis
4 . 22	1R
5 . 23	Chassis
6 . 24	2L
7 . 25	Chassis
8 . 26	2R
9 . 27	Chassis
10 . 28	Chassis
11 . 29	3L
12 . 30	Chassis
13 . 31	3R
14 . 32	Chassis
15 . 33	4L
16 . 34	Chassis
17 . 35	4R
18 . 36	Chassis

Cable 2 Stereo Inputs 5-8	
SCSI Pins	Circuit
1 . 19	Chassis
2 . 20	5L
3 . 21	Chassis
4 . 22	5R
5 . 23	Chassis
6 . 24	6L
7 . 25	Chassis
8 . 26	6R
9 . 27	Chassis
10 . 28	Chassis
11 . 29	7L
12 . 30	Chassis
13 . 31	7R
14 . 32	Chassis
15 . 33	8L
16 . 34	Chassis
17 . 35	8R
18 . 36	Chassis

2 cables for each ADC card fitted (Just one shown here). There are 4 stereo inputs on each cable

On EDACs, pin 1 (A) is HOT (phase), pin 2 (E) is COLD (anti-phase) and pin 3 (B) is chassis connections.

8 WAY EDAC INTERFACE PANEL

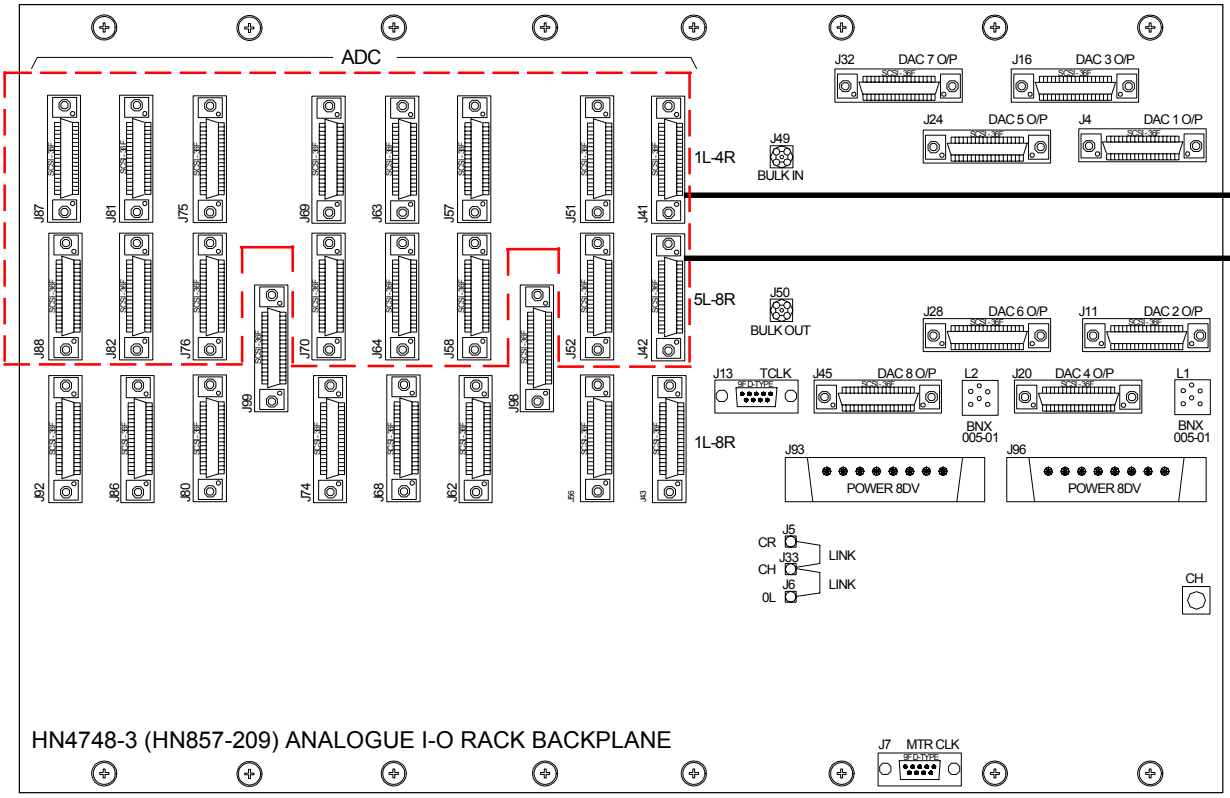


 Ideally, the EDAC interface panels should be located within 3m (9.8ft) of the Analogue I/O Rack.

ANALOGUE MIC/LINE INPUTS (MIC/LINE OR LINE ADC CARDS) - STYLE 2

Each Analogue I/O Rack can house up to 8 mic/line or line input (ADC) cards, each of which provides 8 stereo inputs. The cards are inserted into the slots within the rack, and each slot has 2 dedicated input connectors on the rear of the rack (shown within dotted border), to which the system's analogue inputs are connected. Each of the input connectors provides connections for 4 stereo inputs.

The diagram below shows how these connectors are connected to 8 or 12 way EDAC interface panels via Calrec custom cabling to achieve Style 2 (6 pairs per EDAC connector).



Calrec Custom Cabling

Wired into EDAC - Rear of Interface Panel

A.B (E)	Mic/Line IP 1L
C.D (K)	Mic/Line IP 1R
L.M (F)	Mic/Line IP 2L
N.P (J)	Mic/Line IP 2R
R.S (V)	Mic/Line IP 3L
T.U (W)	Mic/Line IP 3R
Z.AA (X)	Mic/Line IP 4L
BB.CC (Y)	Mic/Line IP 4R
DD.EE (KK)	Mic/Line IP 5L
FF.HH (MM)	Mic/Line IP 5R
PP.RR (JJ)	Mic/Line IP 6L
SS.TT (NN)	Mic/Line IP 6R
H.LL	Chassis

Style 2 - 6 pairs per 38 way EDAC

Stereo Inputs 1-4

Stereo Inputs 5-6

7-8 To Next EDAC

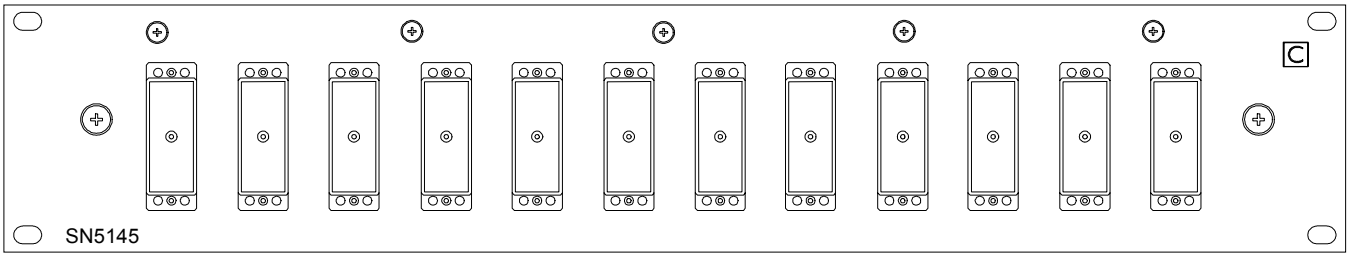
Cable 1 Stereo Inputs 1-4	
SCSI Pins	Circuit
1 . 19	Chassis
2 . 20	1L
3 . 21	Chassis
4 . 22	1R
5 . 23	Chassis
6 . 24	2L
7 . 25	Chassis
8 . 26	2R
9 . 27	Chassis
10 . 28	Chassis
11 . 29	3L
12 . 30	Chassis
13 . 31	3R
14 . 32	Chassis
15 . 33	4L
16 . 34	Chassis
17 . 35	4R
18 . 36	Chassis

Cable 2 Stereo Inputs 5-8	
SCSI Pins	Circuit
1 . 19	Chassis
2 . 20	5L
3 . 21	Chassis
4 . 22	5R
5 . 23	Chassis
6 . 24	6L
7 . 25	Chassis
8 . 26	6R
9 . 27	Chassis
10 . 28	Chassis
11 . 29	7L
12 . 30	Chassis
13 . 31	7R
14 . 32	Chassis
15 . 33	8L
16 . 34	Chassis
17 . 35	8R
18 . 36	Chassis

2 Cables for each ADC card fitted - 4 stereo inputs on each cable. Cable 2 also wires into the first EDAC to provide circuits 5 and 6.

On EDACs, pin 1 (A) is HOT (phase), pin 2 (B) is COLD (anti-phase) and pin 3 (E) is chassis connections.

12 WAY EDAC INTERFACE PANEL

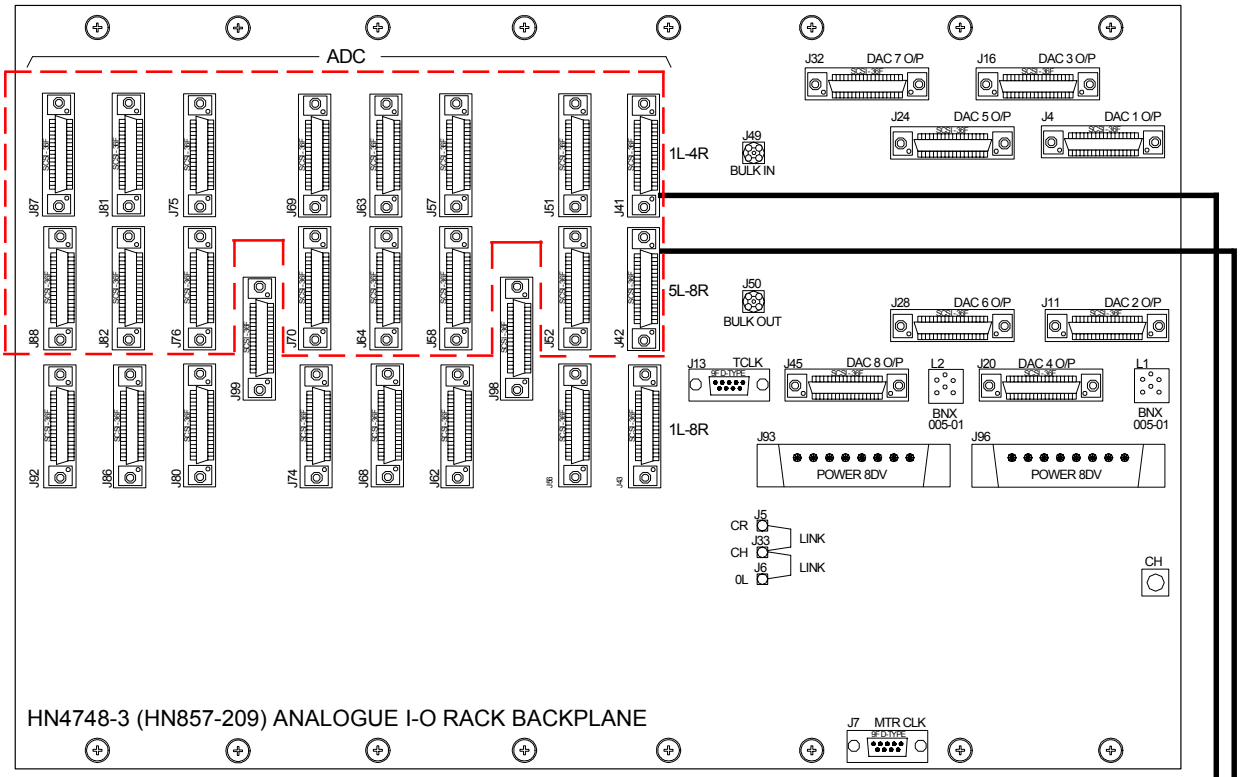


Ideally, the EDAC interface panels should be located within 3m (9.8ft) of the Analogue I/O Rack.

ANALOGUE LINE ONLY INPUTS (LINE ADC CARDS ONLY) - STYLE 1

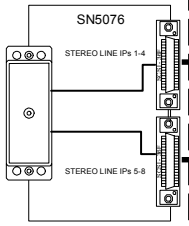
Each Analogue I/O Rack can house up to 8 mic/line or line input (ADC) cards, each of which provides 8 stereo inputs. The cards are inserted into the slots within the rack, and each slot has 2 dedicated input connectors on the rear of the rack (shown within dotted border), to which the system's analogue inputs are connected. Each of the input connectors provides connections for 4 stereo inputs.

The diagram below shows how the line inputs can be connected to 8 way EDAC interface panels via SCSI-style cabling to achieve Style 1 as mentioned earlier (8 pairs per EDAC connector).



Via SN5076 SCSI to 38W EDAC converter card - Rear of Interface Panel

A.B	Line IP 1L
C.D	Line IP 1R
E.F	Line IP 2L
J.K	Line IP 2R
L.M	Line IP 3L
N.P	Line IP 3R
R.S	Line IP 4L
T.U	Line IP 4R
Z.AA	Line IP 5L
BB.CC	Line IP 5R
DD.EE	Line IP 6L
FF.HH	Line IP 6R
JJ.KK	Line IP 7L
MM.NN	Line IP 7R
PP.RR	Line IP 8L
SS.TT	Line IP 8R
H.LL	Chassis



Style 1 - 8 pairs per 38 way EDAC

Stereo IPs 1-4

Stereo IPs 5-8

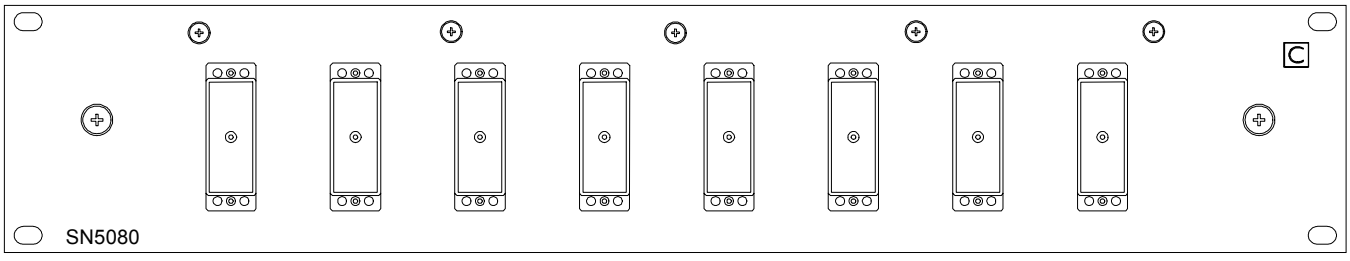
Cable 1 Stereo Inputs 1-4	
SCSI Pins	Circuit
1 . 19	Chassis
2 . 20	1L
3 . 21	Chassis
4 . 22	1R
5 . 23	Chassis
6 . 24	2L
7 . 25	Chassis
8 . 26	2R
9 . 27	Chassis
10 . 28	Chassis
11 . 29	3L
12 . 30	Chassis
13 . 31	3R
14 . 32	Chassis
15 . 33	4L
16 . 34	Chassis
17 . 35	4R
18 . 36	Chassis

Cable 2 Stereo Inputs 5-8	
SCSI Pins	Circuit
1 . 19	Chassis
2 . 20	5L
3 . 21	Chassis
4 . 22	5R
5 . 23	Chassis
6 . 24	6L
7 . 25	Chassis
8 . 26	6R
9 . 27	Chassis
10 . 28	Chassis
11 . 29	7L
12 . 30	Chassis
13 . 31	7R
14 . 32	Chassis
15 . 33	8L
16 . 34	Chassis
17 . 35	8R
18 . 36	Chassis

2 Cables for each ADC card fitted - 4 stereo Inputs on each cable.

On EDAC, the first pin is HOT (phase), the second pin is COLD (anti-phase) and H.LL are chassis connections.

8 WAY EDAC INTERFACE PANEL

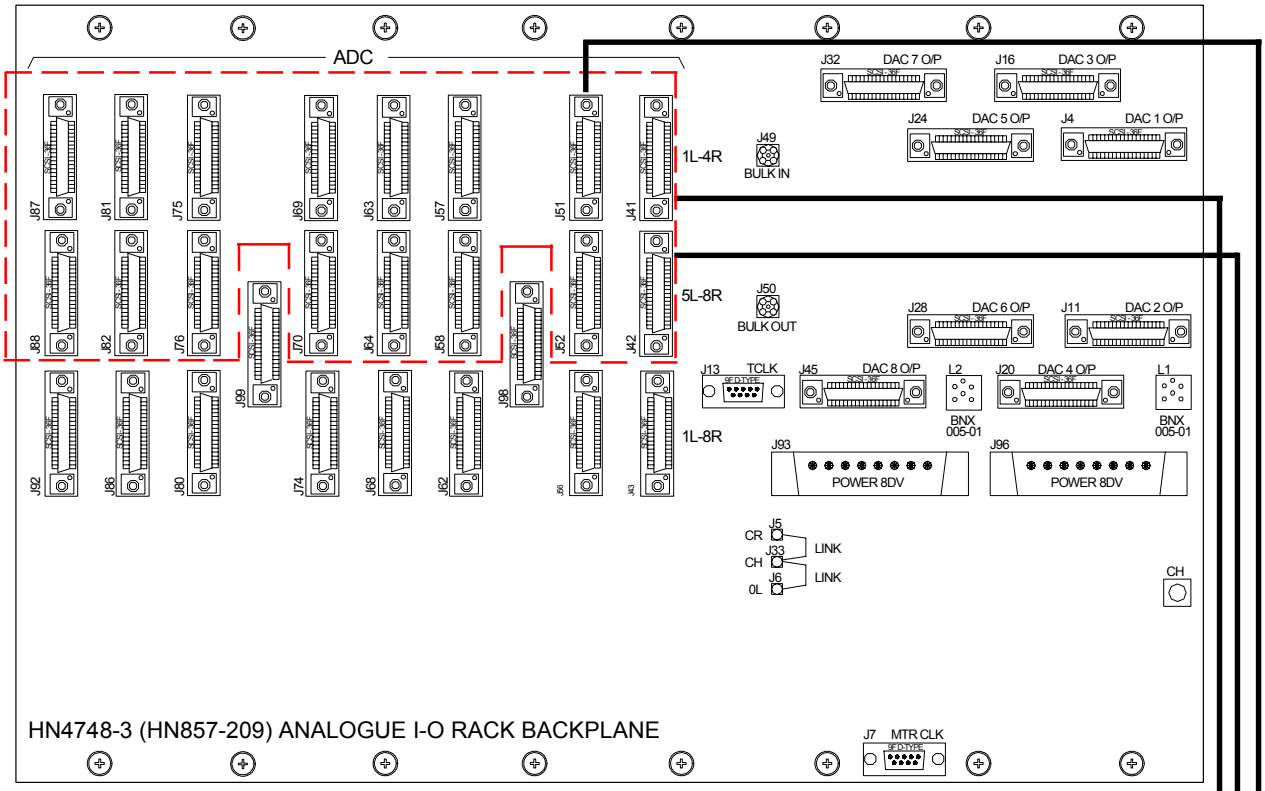


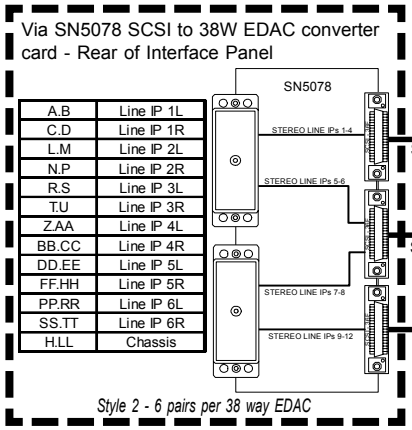
Ideally, the EDAC interface panels should be located within 3m (9.8ft) of the Analogue I/O Rack.

ANALOGUE LINE ONLY INPUTS (LINE ADC CARDS ONLY) - STYLE 2

Each Analogue I/O Rack can house up to 8 mic/line or line input (ADC) cards, each of which provides 8 stereo inputs. The cards are inserted into the slots within the rack, and each slot has 2 dedicated input connectors on the rear of the rack (shown within dotted border), to which the system's analogue inputs are connected. Each of the input connectors provides connections for 4 stereo inputs.

The diagram below shows how the line inputs can be connected to 8 way EDAC interface panels via SCSI-style cabling to achieve Style 2 (6 pairs per EDAC connector).





A.B	Line IP 1L
C.D	Line IP 1R
L.M	Line IP 2L
N.P	Line IP 2R
R.S	Line IP 3L
T.U	Line IP 3R
Z.AA	Line IP 4L
BB.CC	Line IP 4R
DD.EE	Line IP 5L
FF.HH	Line IP 5R
PP.RR	Line IP 6L
SS.TT	Line IP 6R
H.LL	Chassis

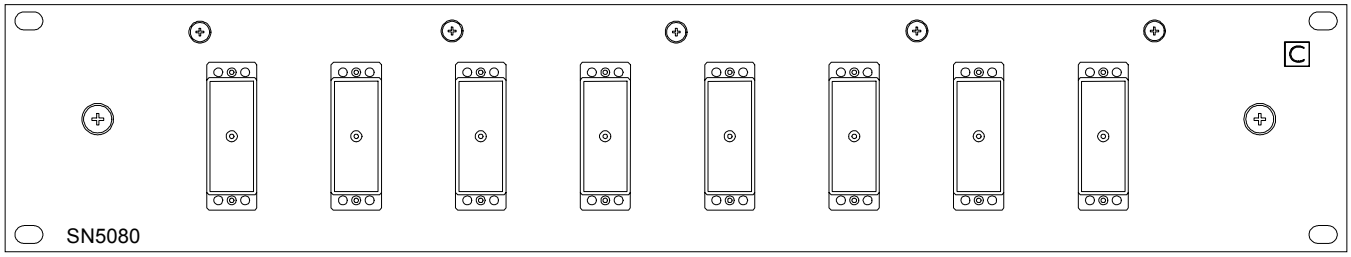
On EDAC, the first pin is HOT (phase), the second pin is COLD (anti-phase) and H.LL are chassis connections.

Cable 1 Stereo Inputs 1-4	
SCSI Pins	Circuit
1 . 19	Chassis
2 . 20	1L
3 . 21	Chassis
4 . 22	1R
5 . 23	Chassis
6 . 24	2L
7 . 25	Chassis
8 . 26	2R
9 . 27	Chassis
10 . 28	Chassis
11 . 29	3L
12 . 30	Chassis
13 . 31	3R
14 . 32	Chassis
15 . 33	4L
16 . 34	Chassis
17 . 35	4R
18 . 36	Chassis

Cable 2 Stereo Inputs 5-8	
SCSI Pins	Circuit
1 . 19	Chassis
2 . 20	5L
3 . 21	Chassis
4 . 22	5R
5 . 23	Chassis
6 . 24	6L
7 . 25	Chassis
8 . 26	6R
9 . 27	Chassis
10 . 28	Chassis
11 . 29	7L
12 . 30	Chassis
13 . 31	7R
14 . 32	Chassis
15 . 33	8L
16 . 34	Chassis
17 . 35	8R
18 . 36	Chassis

2 Cables for each ADC card fitted - 4 stereo inputs on each cable.

8 WAY EDAC INTERFACE PANEL

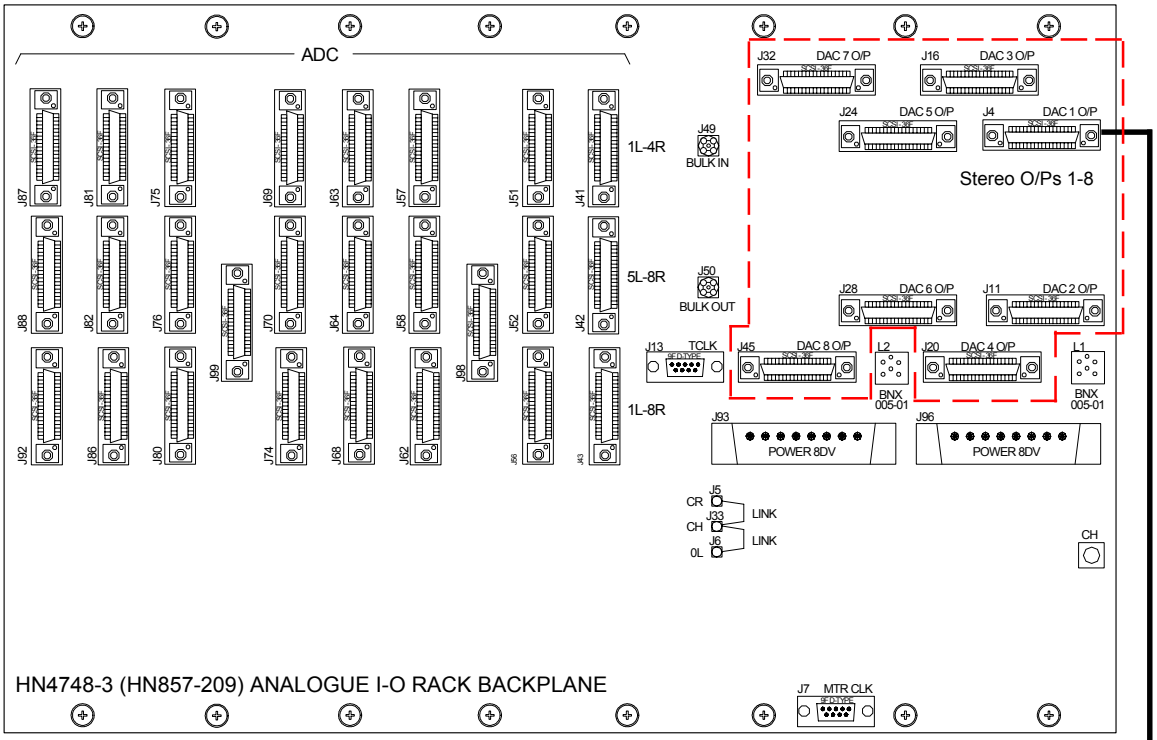


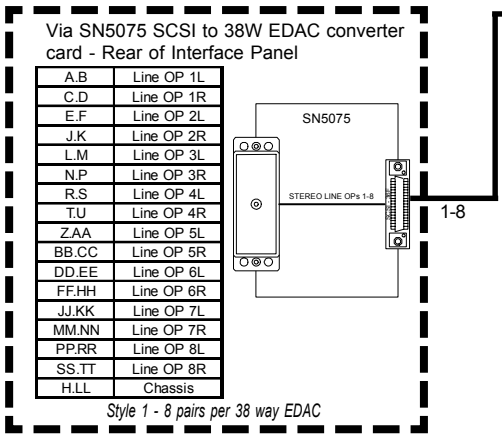
Ideally, the EDAC interface panels should be located within 3m (9.8ft) of the Analogue I/O Rack.

ANALOGUE LINE OUTPUTS (DAC CARDS ONLY) - STYLE 1

Each Analogue I/O Rack can house up to 8 line output (DAC) cards, each of which provides 8 stereo outputs. The cards are inserted into the slots within the rack, these are numbered 1-8. Each slot has a dedicated output connector on the rear of the rack, which provide connections for the system's analogue outputs. Each of the output connectors provides connections for 8 stereo outputs.

The diagram below shows how the line outputs can be connected to 8 way EDAC interface panels via SCSI-style cabling to achieve Style 1 (8 pairs per EDAC connector).





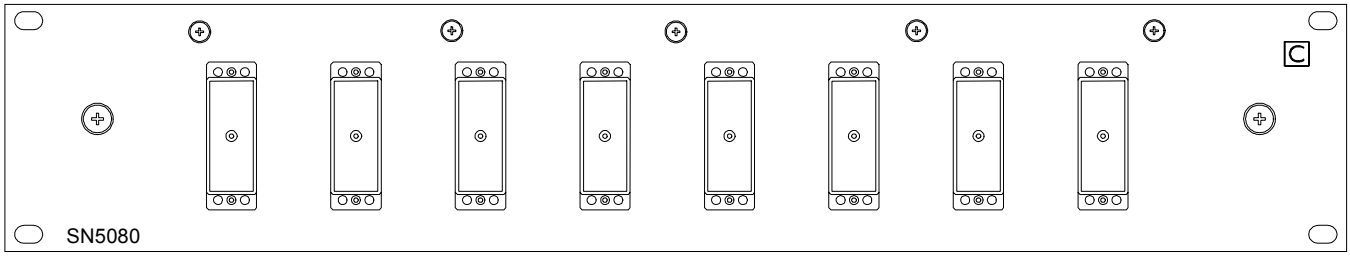
A.B	Line OP 1L
C.D	Line OP 1R
E.F	Line OP 2L
J.K	Line OP 2R
L.M	Line OP 3L
N.P	Line OP 3R
R.S	Line OP 4L
T.U	Line OP 4R
Z.AA	Line OP 5L
BB.CC	Line OP 5R
DD.EE	Line OP 6L
FF.HH	Line OP 6R
JJ.KK	Line OP 7L
MM.NN	Line OP 7R
PP.RR	Line OP 8L
SS.TT	Line OP 8R
H.LL	Chassis

Cable 1 - Stereo Outputs 1-8	
SCSI Pins	**Circuit**
1 . 19	Chassis
2 . 20	1L
3 . 21	1R
4 . 22	2L
5 . 23	2R
6 . 24	3L
7 . 25	3R
8 . 26	4L
9 . 27	4R
10 . 28	5L
11 . 29	5R
12 . 30	6L
13 . 31	6R
14 . 32	7L
15 . 33	7R
16 . 34	8L
17 . 35	8R
18 . 36	Chassis

1 Cable for each DAC card fitted - 8 stereo outputs on each cable.

On EDACs, the first pin is HOT (phase), the second pin is COLD (anti-phase) and H.LL are chassis connections.

8 WAY EDAC INTERFACE PANEL

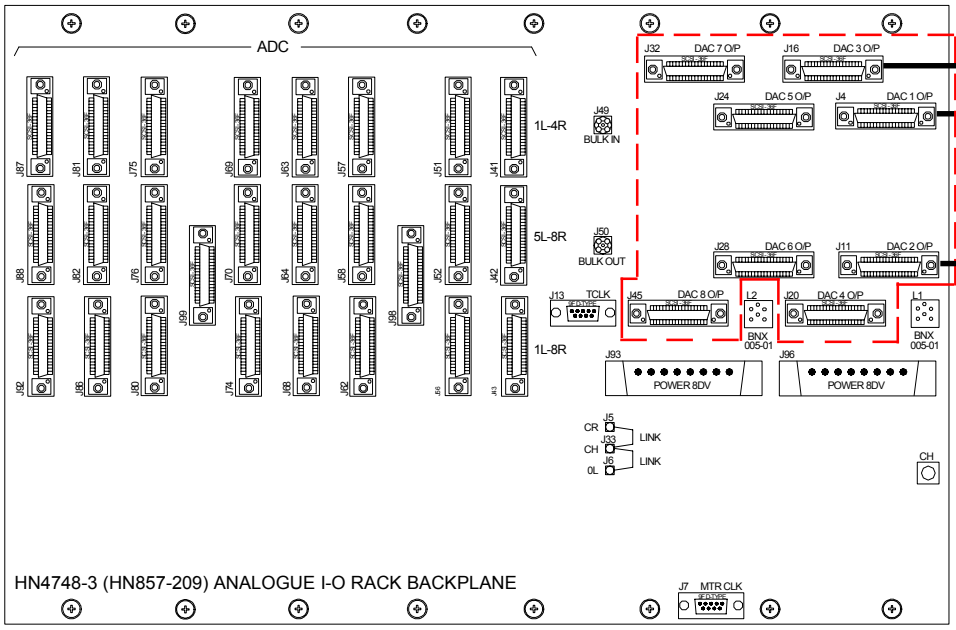


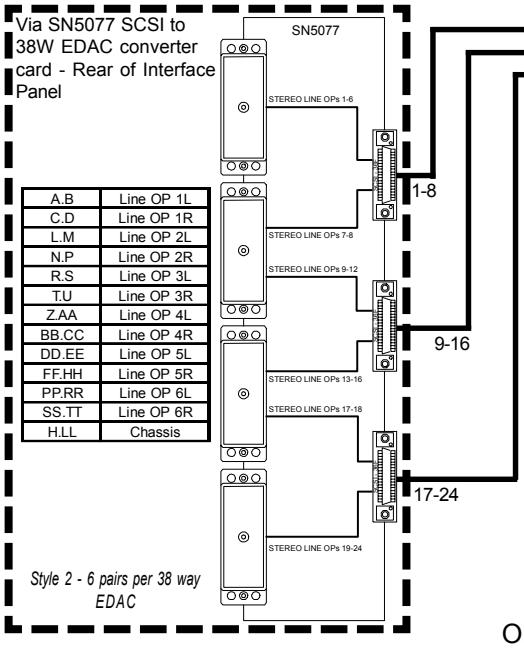
Ideally, the EDAC interface panels should be located within 3m (9.8ft) of the Analogue I/O Rack.

ANALOGUE LINE OUTPUTS (DAC CARDS ONLY) - STYLE 2

Each Analogue I/O Rack can house up to 8 line output (DAC) cards, each of which provides 8 stereo outputs. The cards are inserted into the slots within the rack, these are numbered 1-8. Each slot has a dedicated output connector on the rear of the rack, which provide connections for the system's analogue outputs. Each of the output connectors provides connections for 8 stereo outputs.

The diagram below shows how the line outputs can be connected to 8 way EDAC interface panels via SCSI-style cabling to achieve Style 2 as mentioned earlier (6 pairs per EDAC).





A.B	Line OP 1L
C.D	Line OP 1R
L.M	Line OP 2L
N.P	Line OP 2R
R.S	Line OP 3L
T.U	Line OP 3R
Z.AA	Line OP 4L
BB.CC	Line OP 4R
DD.EE	Line OP 5L
FF.HH	Line OP 5R
PP.RR	Line OP 6L
SS.TT	Line OP 6R
H.LL	Chassis

1 Cable for each DAC card fitted - 8 stereo outputs on each cable.

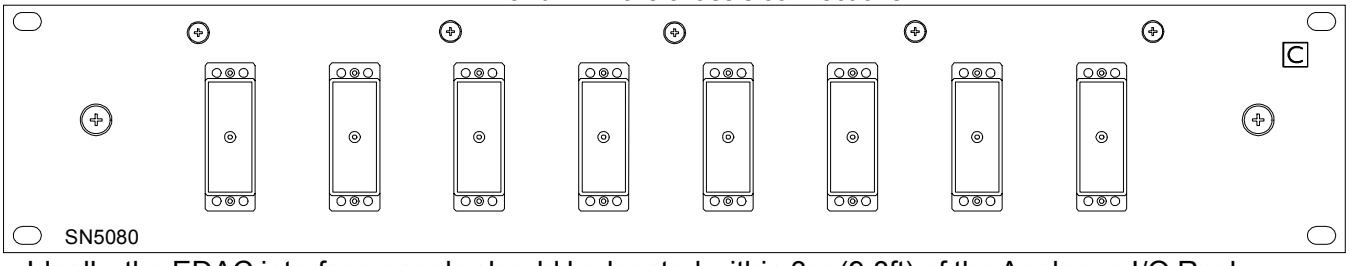
Cable 1 - Stereo Outputs 1-8	
SCSI Pins	Circuit
1 . 19	Chassis
2 . 20	1L
3 . 21	1R
4 . 22	2L
5 . 23	2R
6 . 24	3L
7 . 25	3R
8 . 26	4L
9 . 27	4R
10 . 28	5L
11 . 29	5R
12 . 30	6L
13 . 31	6R
14 . 32	7L
15 . 33	7R
16 . 34	8L
17 . 35	8R
18 . 36	Chassis

Cable 2 - Stereo Outputs 9-16	
SCSI Pins	Circuit
1 . 19	Chassis
2 . 20	9L
3 . 21	9R
4 . 22	10L
5 . 23	10R
6 . 24	11L
7 . 25	11R
8 . 26	12L
9 . 27	12R
10 . 28	13L
11 . 29	13R
12 . 30	14L
13 . 31	14R
14 . 32	15L
15 . 33	15R
16 . 34	16L
17 . 35	16R
18 . 36	Chassis

Cable 3 - Stereo Outputs 17-24	
SCSI Pins	Circuit
1 . 19	Chassis
2 . 20	17L
3 . 21	17R
4 . 22	18L
5 . 23	18R
6 . 24	19L
7 . 25	19R
8 . 26	20L
9 . 27	20R
10 . 28	21L
11 . 29	21R
12 . 30	22L
13 . 31	22R
14 . 32	23L
15 . 33	23R
16 . 34	24L
17 . 35	24R
18 . 36	Chassis

On EDACs, the first pin is HOT (phase), the second pin is COLD (anti-phase) and H.LL are chassis connections.

8 WAY EDAC INTERFACE PANEL



Ideally, the EDAC interface panels should be located within 3m (9.8ft) of the Analogue I/O Rack.

Planning the Use and Labelling of Inputs and Outputs

INPUT/OUTPUT PORT LABELLING

The system allows the user to pre-define labels for all the I/O, using their own preferred names and numbers.

The only rules imposed on this are that:

- The I/O is labelled in pairs.
- The label must be no more than six characters.
- The same label cannot be used more than once (but an input can have the same label as an output).

I/O is labelled in pairs to make it easier to use with any type of signal; mono, stereo or surround. In addition to this, Digital I/O is wired in pairs and it makes sense to deal with all the I/O in the same way.

The input port label is used as the default name for the channel input and will be shown on the display above the fader.

The system automatically adds a left (ᴸ) and right (ᴿ) suffix to the label to distinguish the two halves of the pair, or an ᴸᴿ suffix when the pair is used together.

The pairs can be used either for two mono signals, or a stereo signal, or parts of a surround signal.

One exception to these rules is allowed:

This is for I/O which is dedicated to mono signals only (phone lines, mono reverbs, mono distribution feeds, etc). This I/O can be marked as being mono in which case the two halves of the pair have separate labels and the ᴸ & ᴿ suffixes are not applied.

Note that I/O marked in this way cannot be connected in pairs to stereo paths from the I/O Matrix panel on the control surface.

A stereo channel input can only be connected to the L - R of a pair of ports, or to one mono port in which case the mono signal will be fed to both L & R of the channel.

A stereo channel direct output can only be connected to the L - R of a pair of ports.

A mono channel input or direct output can be connected to any of: The L or R of a pair of ports, or any mono port.

Mono ports should therefore be considered as unusual. If there is any doubt as to the use of ports, they should be treated as a pair.

SUITABLE LABELS

Generally, input and output ports should be labelled with the name which appears at the other end of the cable, which is connected to the port.

Ideally, the port will be connected directly to a device (Mic splitter box, Video Tape Recorder, Echo unit, Transmission Control Suite, etc).

Alternatively, some I/O may be wired to a patch. This will be done, for example, to allow for hired devices to be connected and may also be done to aid maintenance and operator familiarity with analogue consoles.

When planning the use and labelling of I/O, you should also bear in mind that the console includes an internal electronic input patch and output patch. These allow ports to be used for different purposes on different shows and also, the patch connections are stored with the snap-shot memories.

Port Lists

In addition to labelling, each port may be allocated to one of a number of lists during the Set up Application. This allows inputs and outputs which are wired for similar purposes to be grouped together for selection. There can be up to 12 lists for input ports, and up to 8 lists for output ports. Each list can contain a mixture of normal inputs or outputs (labelled in pairs) and inputs or outputs dedicated to mono signals. Each list is given a six character label, and automatically sorted alphabetically/numerically.

The lists can be sorted into the order in which they appear on the selection screens. The lists will appear in the same order on the optional I/O Matrix panel (if fitted) and I/O screens. It is possible to restrict the lists which appear on the I/O Matrix panel using the Options - Misc screen. This reduces the number of times the pot needs to be pushed, to go through all the available lists. All lists are always available on the I/O screens.

INPUT/OUTPUT LABELLING SHEETS

AES Inputs - DSP/Digital I/O Rack

Card Slot No..... SCSI Connector No.....

Input	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
1L + 1R							L R		
2L + 2R							L R		
3L + 3R							L R		
4L + 4R							L R		
5L + 5R							L R		
6L + 6R							L R		
7L + 7R							L R		
8L + 8R							L R		
9L + 9R							L R		
10L + 10R							L R		
11L + 11R							L R		
12L + 12R							L R		
13L + 13R							L R		
14L + 14R							L R		
15L + 15R							L R		
16L + 16R							L R		

Card Slot No..... SCSI Connector No.....

Input	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
1L + 1R							L R		
2L + 2R							L R		
3L + 3R							L R		
4L + 4R							L R		
5L + 5R							L R		
6L + 6R							L R		
7L + 7R							L R		
8L + 8R							L R		
9L + 9R							L R		
10L + 10R							L R		
11L + 11R							L R		
12L + 12R							L R		
13L + 13R							L R		
14L + 14R							L R		
15L + 15R							L R		
16L + 16R							L R		

INPUT/OUTPUT LABELLING SHEETS

AES Inputs - DSP/Digital I/O Rack

Card Slot No..... SCSI Connector No.....

Input	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
1L + 1R							L R		
2L + 2R							L R		
3L + 3R							L R		
4L + 4R							L R		
5L + 5R							L R		
6L + 6R							L R		
7L + 7R							L R		
8L + 8R							L R		
9L + 9R							L R		
10L + 10R							L R		
11L + 11R							L R		
12L + 12R							L R		
13L + 13R							L R		
14L + 14R							L R		
15L + 15R							L R		
16L + 16R							L R		

Card Slot No..... SCSI Connector No.....

Input	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
1L + 1R							L R		
2L + 2R							L R		
3L + 3R							L R		
4L + 4R							L R		
5L + 5R							L R		
6L + 6R							L R		
7L + 7R							L R		
8L + 8R							L R		
9L + 9R							L R		
10L + 10R							L R		
11L + 11R							L R		
12L + 12R							L R		
13L + 13R							L R		
14L + 14R							L R		
15L + 15R							L R		
16L + 16R							L R		

INPUT/OUTPUT LABELLING SHEETS

AES Inputs - DSP/Digital I/O Rack

Card Slot No..... SCSI Connector No.....

Input	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
1L + 1R							L R		
2L + 2R							L R		
3L + 3R							L R		
4L + 4R							L R		
5L + 5R							L R		
6L + 6R							L R		
7L + 7R							L R		
8L + 8R							L R		
9L + 9R							L R		
10L + 10R							L R		
11L + 11R							L R		
12L + 12R							L R		
13L + 13R							L R		
14L + 14R							L R		
15L + 15R							L R		
16L + 16R							L R		

Card Slot No..... SCSI Connector No.....

Input	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
1L + 1R							L R		
2L + 2R							L R		
3L + 3R							L R		
4L + 4R							L R		
5L + 5R							L R		
6L + 6R							L R		
7L + 7R							L R		
8L + 8R							L R		
9L + 9R							L R		
10L + 10R							L R		
11L + 11R							L R		
12L + 12R							L R		
13L + 13R							L R		
14L + 14R							L R		
15L + 15R							L R		
16L + 16R							L R		

INPUT/OUTPUT LABELLING SHEETS

AES Outputs - DSP/Digital I/O Rack

Card Slot No..... SCSI Connector No.....

Output	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
1L + 1R							L R		
2L + 2R							L R		
3L + 3R							L R		
4L + 4R							L R		
5L + 5R							L R		
6L + 6R							L R		
7L + 7R							L R		
8L + 8R							L R		
9L + 9R							L R		
10L + 10R							L R		
11L + 11R							L R		
12L + 12R							L R		
13L + 13R							L R		
14L + 14R							L R		
15L + 15R							L R		
16L + 16R							L R		

Card Slot No..... SCSI Connector No.....

Output	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
1L + 1R							L R		
2L + 2R							L R		
3L + 3R							L R		
4L + 4R							L R		
5L + 5R							L R		
6L + 6R							L R		
7L + 7R							L R		
8L + 8R							L R		
9L + 9R							L R		
10L + 10R							L R		
11L + 11R							L R		
12L + 12R							L R		
13L + 13R							L R		
14L + 14R							L R		
15L + 15R							L R		
16L + 16R							L R		

INPUT/OUTPUT LABELLING SHEETS

AES Outputs - DSP/Digital I/O Rack

Card Slot No..... SCSI Connector No.....

Output	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
1L + 1R							L R		
2L + 2R							L R		
3L + 3R							L R		
4L + 4R							L R		
5L + 5R							L R		
6L + 6R							L R		
7L + 7R							L R		
8L + 8R							L R		
9L + 9R							L R		
10L + 10R							L R		
11L + 11R							L R		
12L + 12R							L R		
13L + 13R							L R		
14L + 14R							L R		
15L + 15R							L R		
16L + 16R							L R		

Card Slot No..... SCSI Connector No.....

Output	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
1L + 1R							L R		
2L + 2R							L R		
3L + 3R							L R		
4L + 4R							L R		
5L + 5R							L R		
6L + 6R							L R		
7L + 7R							L R		
8L + 8R							L R		
9L + 9R							L R		
10L + 10R							L R		
11L + 11R							L R		
12L + 12R							L R		
13L + 13R							L R		
14L + 14R							L R		
15L + 15R							L R		
16L + 16R							L R		

INPUT/OUTPUT LABELLING SHEETS

AES Outputs - DSP/Digital I/O Rack

Card Slot No..... SCSI Connector No.....

Output	Label for LR pair (or 1st of 2 mono) 6 characters						L R	Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
1L + 1R							L R		
2L + 2R							L R		
3L + 3R							L R		
4L + 4R							L R		
5L + 5R							L R		
6L + 6R							L R		
7L + 7R							L R		
8L + 8R							L R		
9L + 9R							L R		
10L + 10R							L R		
11L + 11R							L R		
12L + 12R							L R		
13L + 13R							L R		
14L + 14R							L R		
15L + 15R							L R		
16L + 16R							L R		

Card Slot No..... SCSI Connector No.....

Output	Label for LR pair (or 1st of 2 mono) 6 characters						L R	Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
1L + 1R							L R		
2L + 2R							L R		
3L + 3R							L R		
4L + 4R							L R		
5L + 5R							L R		
6L + 6R							L R		
7L + 7R							L R		
8L + 8R							L R		
9L + 9R							L R		
10L + 10R							L R		
11L + 11R							L R		
12L + 12R							L R		
13L + 13R							L R		
14L + 14R							L R		
15L + 15R							L R		
16L + 16R							L R		

SIGMA SYSTEM PLUS

CALREC

INPUT/OUTPUT LABELLING SHEETS

Analogue Inputs - Analogue I/O Rack 1

Card Slot No.................. SCSI Connectors .... and ....

Connector Number	Input	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
	1L + 1R							L R		
	2L + 2R							L R		
	3L + 3R							L R		
	4L + 4R							L R		
	5L + 5R							L R		
	6L + 6R							L R		
	7L + 7R							L R		
	8L + 8R							L R		

Card Slot No.................. SCSI Connectors .... and ....

Connector Number	Input	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
	1L + 1R							L R		
	2L + 2R							L R		
	3L + 3R							L R		
	4L + 4R							L R		
	5L + 5R							L R		
	6L + 6R							L R		
	7L + 7R							L R		
	8L + 8R							L R		

Card Slot No.................. SCSI Connectors .... and ....

Connector Number	Input	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
	1L + 1R							L R		
	2L + 2R							L R		
	3L + 3R							L R		
	4L + 4R							L R		
	5L + 5R							L R		
	6L + 6R							L R		
	7L + 7R							L R		
	8L + 8R							L R		

Card Slot No.................. SCSI Connectors .... and ....

Connector Number	Input	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
	1L + 1R							L R		
	2L + 2R							L R		
	3L + 3R							L R		
	4L + 4R							L R		
	5L + 5R							L R		
	6L + 6R							L R		
	7L + 7R							L R		
	8L + 8R							L R		

INPUT/OUTPUT LABELLING SHEETS

Analogue Inputs - Analogue I/O Rack 1

Card Slot No.................. SCSI Connectors .... and ....

Connector Number	Input	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
	1L + 1R							L R		
	2L + 2R							L R		
	3L + 3R							L R		
	4L + 4R							L R		
	5L + 5R							L R		
	6L + 6R							L R		
	7L + 7R							L R		
	8L + 8R							L R		

Card Slot No.................. SCSI Connectors .... and ....

Connector Number	Input	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
	1L + 1R							L R		
	2L + 2R							L R		
	3L + 3R							L R		
	4L + 4R							L R		
	5L + 5R							L R		
	6L + 6R							L R		
	7L + 7R							L R		
	8L + 8R							L R		

Card Slot No.................. SCSI Connectors .... and ....

Connector Number	Input	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
	1L + 1R							L R		
	2L + 2R							L R		
	3L + 3R							L R		
	4L + 4R							L R		
	5L + 5R							L R		
	6L + 6R							L R		
	7L + 7R							L R		
	8L + 8R							L R		

Card Slot No.................. SCSI Connectors .... and ....

Connector Number	Input	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
	1L + 1R							L R		
	2L + 2R							L R		
	3L + 3R							L R		
	4L + 4R							L R		
	5L + 5R							L R		
	6L + 6R							L R		
	7L + 7R							L R		
	8L + 8R							L R		

INPUT/OUTPUT LABELLING SHEETS

Analogue Inputs - Analogue I/O Rack 2 (if fitted)

Card Slot No................... SCSI Connectors .... and ....

Connector Number	Input	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
	1L + 1R							L R		
	2L + 2R							L R		
	3L + 3R							L R		
	4L + 4R							L R		
	5L + 5R							L R		
	6L + 6R							L R		
	7L + 7R							L R		
	8L + 8R							L R		

Card Slot No................... SCSI Connectors .... and ....

Connector Number	Input	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
	1L + 1R							L R		
	2L + 2R							L R		
	3L + 3R							L R		
	4L + 4R							L R		
	5L + 5R							L R		
	6L + 6R							L R		
	7L + 7R							L R		
	8L + 8R							L R		

Card Slot No................... SCSI Connectors .... and ....

Connector Number	Input	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
	1L + 1R							L R		
	2L + 2R							L R		
	3L + 3R							L R		
	4L + 4R							L R		
	5L + 5R							L R		
	6L + 6R							L R		
	7L + 7R							L R		
	8L + 8R							L R		

Card Slot No................... SCSI Connectors .... and ....

Connector Number	Input	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
	1L + 1R							L R		
	2L + 2R							L R		
	3L + 3R							L R		
	4L + 4R							L R		
	5L + 5R							L R		
	6L + 6R							L R		
	7L + 7R							L R		
	8L + 8R							L R		

INPUT/OUTPUT LABELLING SHEETS

Analogue Inputs - Analogue I/O Rack 2 (if fitted)

Card Slot No................... SCSI Connectors .... and ....

Connector Number	Input	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
	1L + 1R							L R		
	2L + 2R							L R		
	3L + 3R							L R		
	4L + 4R							L R		
	5L + 5R							L R		
	6L + 6R							L R		
	7L + 7R							L R		
	8L + 8R							L R		

Card Slot No................... SCSI Connectors .... and ....

Connector Number	Input	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
	1L + 1R							L R		
	2L + 2R							L R		
	3L + 3R							L R		
	4L + 4R							L R		
	5L + 5R							L R		
	6L + 6R							L R		
	7L + 7R							L R		
	8L + 8R							L R		

Card Slot No................... SCSI Connectors .... and ....

Connector Number	Input	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
	1L + 1R							L R		
	2L + 2R							L R		
	3L + 3R							L R		
	4L + 4R							L R		
	5L + 5R							L R		
	6L + 6R							L R		
	7L + 7R							L R		
	8L + 8R							L R		

Card Slot No................... SCSI Connectors .... and ....

Connector Number	Input	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
	1L + 1R							L R		
	2L + 2R							L R		
	3L + 3R							L R		
	4L + 4R							L R		
	5L + 5R							L R		
	6L + 6R							L R		
	7L + 7R							L R		
	8L + 8R							L R		

INPUT/OUTPUT LABELLING SHEETS

Analogue Outputs - Analogue I/O Rack 1

Card Slot No................... SCSI Connector No ....

Output	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
1L + 1R							L R		
2L + 2R							L R		
3L + 3R							L R		
4L + 4R							L R		
5L + 5R							L R		
6L + 6R							L R		
7L + 7R							L R		
8L + 8R							L R		

Card Slot No................... SCSI Connector No ....

Output	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
1L + 1R							L R		
2L + 2R							L R		
3L + 3R							L R		
4L + 4R							L R		
5L + 5R							L R		
6L + 6R							L R		
7L + 7R							L R		
8L + 8R							L R		

Card Slot No................... SCSI Connector No ....

Output	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
1L + 1R							L R		
2L + 2R							L R		
3L + 3R							L R		
4L + 4R							L R		
5L + 5R							L R		
6L + 6R							L R		
7L + 7R							L R		
8L + 8R							L R		

Card Slot No................... SCSI Connector No ....

Output	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
1L + 1R							L R		
2L + 2R							L R		
3L + 3R							L R		
4L + 4R							L R		
5L + 5R							L R		
6L + 6R							L R		
7L + 7R							L R		
8L + 8R							L R		

INPUT/OUTPUT LABELLING SHEETS

Analogue Outputs - Analogue I/O Rack 1

Card Slot No.................. SCSI Connector No ....

Output	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
1L + 1R							L R		
2L + 2R							L R		
3L + 3R							L R		
4L + 4R							L R		
5L + 5R							L R		
6L + 6R							L R		
7L + 7R							L R		
8L + 8R							L R		

Card Slot No.................. SCSI Connector No ....

Output	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
1L + 1R							L R		
2L + 2R							L R		
3L + 3R							L R		
4L + 4R							L R		
5L + 5R							L R		
6L + 6R							L R		
7L + 7R							L R		
8L + 8R							L R		

Card Slot No.................. SCSI Connector No ....

Output	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
1L + 1R							L R		
2L + 2R							L R		
3L + 3R							L R		
4L + 4R							L R		
5L + 5R							L R		
6L + 6R							L R		
7L + 7R							L R		
8L + 8R							L R		

Card Slot No.................. SCSI Connector No ....

Output	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
1L + 1R							L R		
2L + 2R							L R		
3L + 3R							L R		
4L + 4R							L R		
5L + 5R							L R		
6L + 6R							L R		
7L + 7R							L R		
8L + 8R							L R		

INPUT/OUTPUT LABELLING SHEETS

Analogue Outputs - Analogue I/O Rack 2 (if fitted)

Card Slot No.................. SCSI Connector No ....

Output	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
1L + 1R							L R		
2L + 2R							L R		
3L + 3R							L R		
4L + 4R							L R		
5L + 5R							L R		
6L + 6R							L R		
7L + 7R							L R		
8L + 8R							L R		

Card Slot No.................. SCSI Connector No ....

Output	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
1L + 1R							L R		
2L + 2R							L R		
3L + 3R							L R		
4L + 4R							L R		
5L + 5R							L R		
6L + 6R							L R		
7L + 7R							L R		
8L + 8R							L R		

Card Slot No.................. SCSI Connector No ....

Output	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
1L + 1R							L R		
2L + 2R							L R		
3L + 3R							L R		
4L + 4R							L R		
5L + 5R							L R		
6L + 6R							L R		
7L + 7R							L R		
8L + 8R							L R		

Card Slot No.................. SCSI Connector No ....

Output	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
1L + 1R							L R		
2L + 2R							L R		
3L + 3R							L R		
4L + 4R							L R		
5L + 5R							L R		
6L + 6R							L R		
7L + 7R							L R		
8L + 8R							L R		

INPUT/OUTPUT LABELLING SHEETS

Analogue Outputs - Analogue I/O Rack 2 (if fitted)

Card Slot No.................... SCSI Connector No ....

Output	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
1L + 1R							L R		
2L + 2R							L R		
3L + 3R							L R		
4L + 4R							L R		
5L + 5R							L R		
6L + 6R							L R		
7L + 7R							L R		
8L + 8R							L R		

Card Slot No.................... SCSI Connector No ....

Output	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
1L + 1R							L R		
2L + 2R							L R		
3L + 3R							L R		
4L + 4R							L R		
5L + 5R							L R		
6L + 6R							L R		
7L + 7R							L R		
8L + 8R							L R		

Card Slot No.................... SCSI Connector No ....

Output	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
1L + 1R							L R		
2L + 2R							L R		
3L + 3R							L R		
4L + 4R							L R		
5L + 5R							L R		
6L + 6R							L R		
7L + 7R							L R		
8L + 8R							L R		

Card Slot No.................... SCSI Connector No ....

Output	Label for LR pair (or 1st of 2 mono) 6 characters							Circuit Description	2nd Label (only if pair dedicated to 2 mono signals)
1L + 1R							L R		
2L + 2R							L R		
3L + 3R							L R		
4L + 4R							L R		
5L + 5R							L R		
6L + 6R							L R		
7L + 7R							L R		
8L + 8R							L R		

Notes

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