ZETA SYSTEM PLUS

INSTALLATION MANUAL

ISSUE 7

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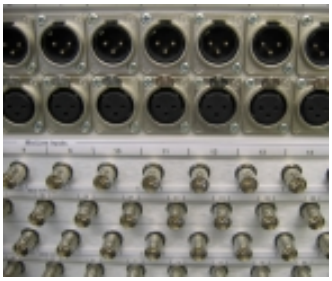

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Whilst the Company takes the utmost care in ensuring that all details in this document are correct at the time of publication, we reserve the right to alter specifications and equipment without notice. Any changes we make will be reflected in subsequent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

ZETA SYSTEM PLUS

CALREC

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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 :-

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Email: support@calrec.com
Website: www.calrec.com

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

- Arrange 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.

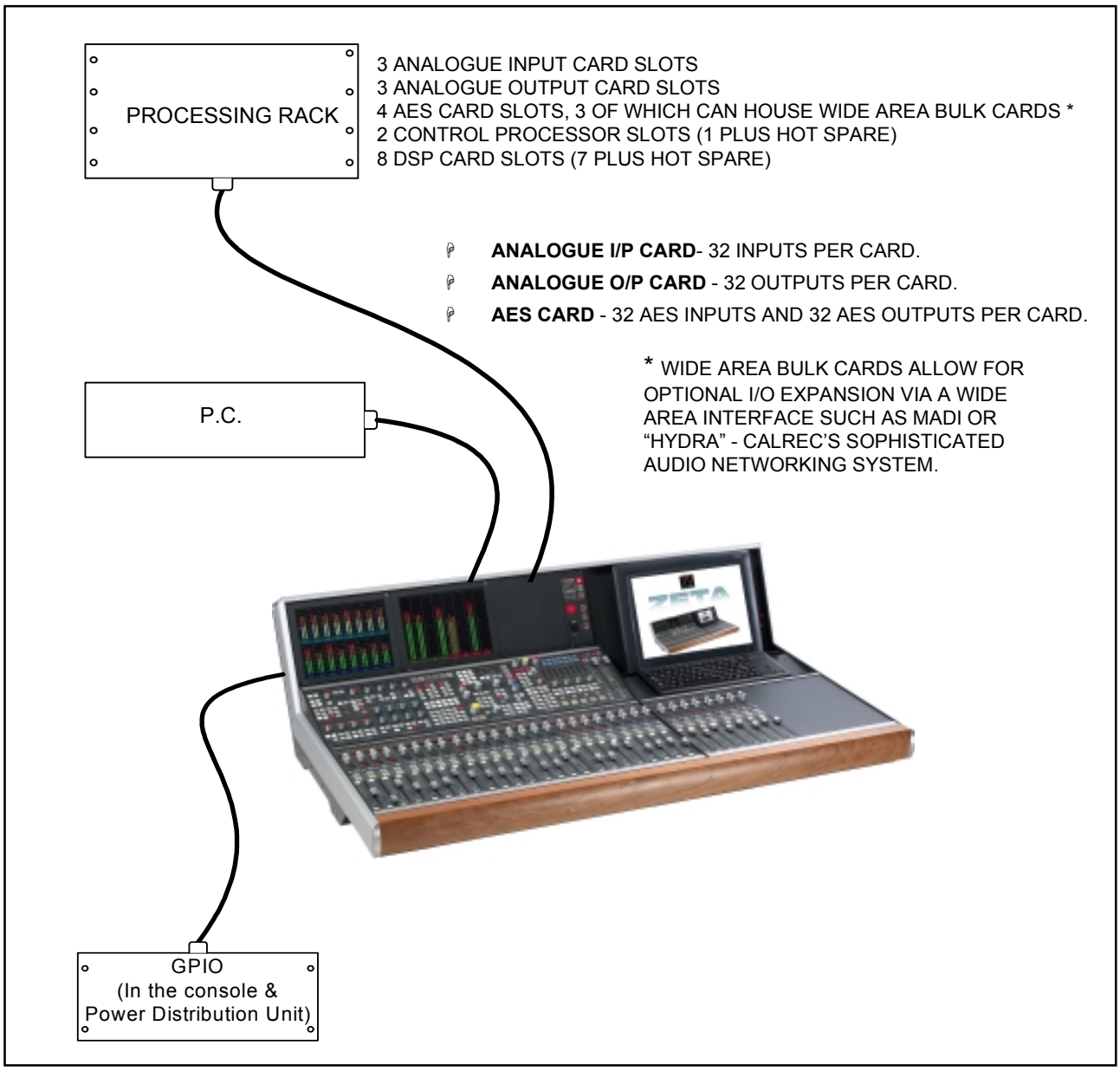
Standard of Service

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 three frame sizes - 24 fader, 32 fader and 48 fader.
- 108 or 112 equivalent channels (up to 42 stereo/mono plus 24 mono channels, or 56 stereo).
- Table-top or floor stand mounting.
- Console operates independently of PC, and PC failure has no effect on audio or control.
- 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 reset.
- Automatic change over to hot spares for PSU's, control cards and DSP cards.
- Hot plugging of every card and module.
- Hot plugged cards initialise upon insertion.



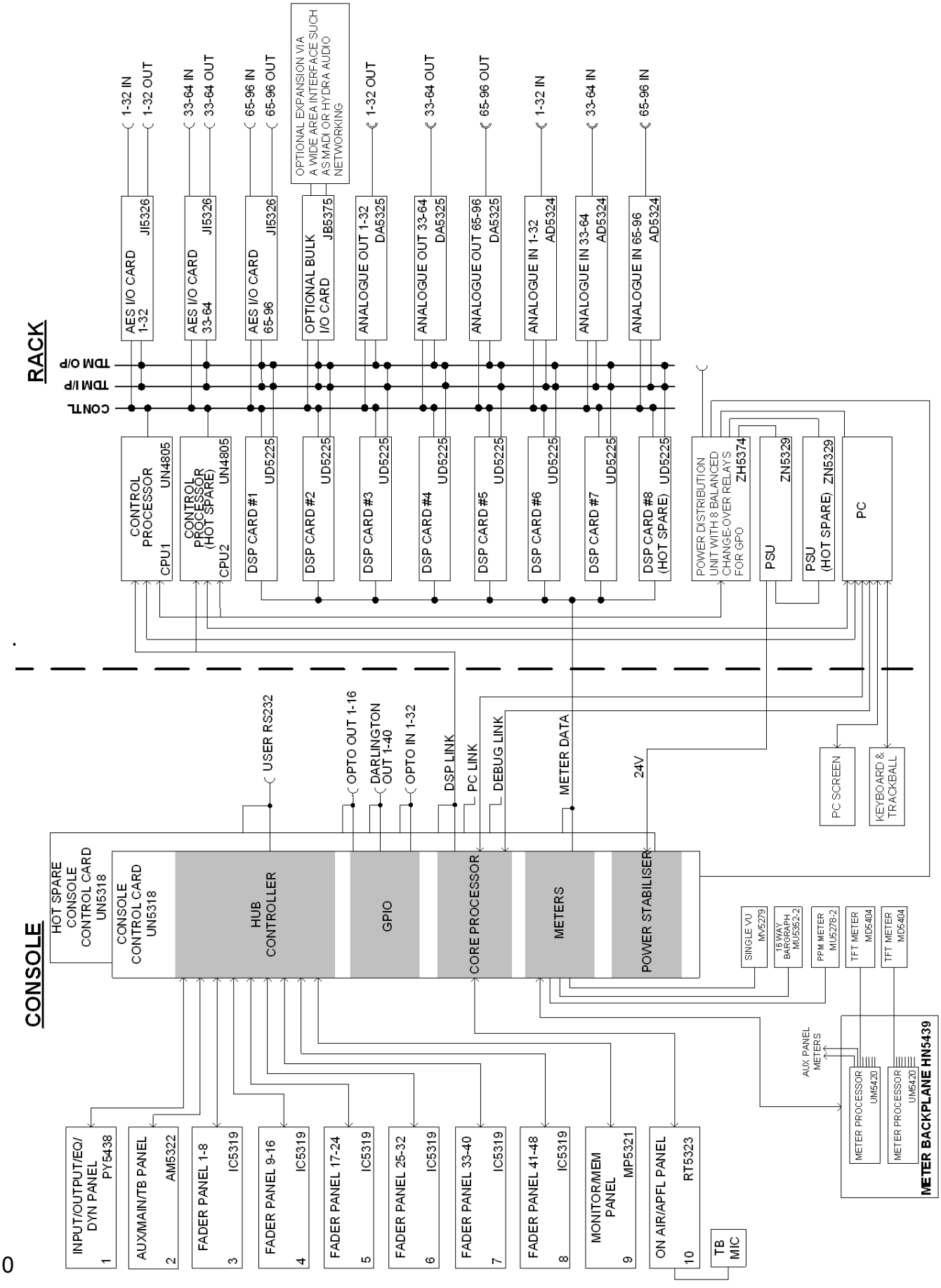
AUDIO PACKS

The console is supplied in combinations of four basic processing cores (packs) providing pre-defined numbers of channels I/O and input delay legs. Each of the four core provisions A, B, C and D are available with all stereo channels or a specific mono/stereo configuration as described below. In addition, Pack A is available with 4 or 8 audio groups.

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

Audio Pack	A1	A2	A3	A4	B1	B2	C1	C2	D1	D2
Stereo Channels	24	30	20	26	30	36	32	48	42	56
Mono Channels	8	0	8	0	10	0	24	0	24	0
Mono/Stereo Groups	4	4	8	8	8	8	8	8	8	8
Mic/Line Inputs	32	32	32	32	64	64	96	96	96	96
Line Outputs	32	32	32	32	64	64	96	96	96	96
AES Inputs	32	32	32	32	32	32	64	64	96	96
AES Outputs	32	32	32	32	32	32	64	64	96	96
Delay Legs (Mono)	8	8	8	8	15	15	24	24	21	21

TYPICAL SYSTEM DIAGRAM



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 and processing rack 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 PSU in the Bulk PSU racks has one inlet, each Multi-Rail power supply unit has one inlet, the PC has one inlet, and 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	
Word Length	24-Bit
Formats Supported	AES/EBU (AES3) 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	
Word Length	24-Bit
Formats Supported	AES/EBU (AES3)
Interface	Transformer balanced 4V Pk-Pk (nominal) into 110 Ohm load Unbalanced 1V Pk-Pk (nominal) into 75 Ohm load (BNC)

ANALOGUE INPUTS	
Analogue - Digital Conversion	24-Bit
Input Balance	Electronically Balanced - Better than -80dB
Input Impedance	>1kOhms for Mic gains, 10k Ohms for line gains
Sensitivity	+18 / -78dB
Equivalent Input Noise	-125dB (150 Ohm source, 22Hz-22kHz bandwidth)
Distortion	-1dBFS @ 1kHz - Better than 0.006% -20dBFS @ 1kHz - Better than 0.004% -60dBFS @ 1kHz - Better than 0.3%
Frequency Response	20Hz to 20kHz +/- 0.5dB
ANALOGUE OUTPUTS	
Digital - Analogue Conversion	24-Bit
Output Balance	Electronically Balanced, 20Hz to 20kHz, Better than -45dB, typically -55dB
Output Impedance	<40 Ohms
Distortion	-1dBFS @ 1kHz - Better than 0.003% -20dBFS @ 1kHz - Better than 0.006% -60dBFS @ 1kHz - Better than 0.5%
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)

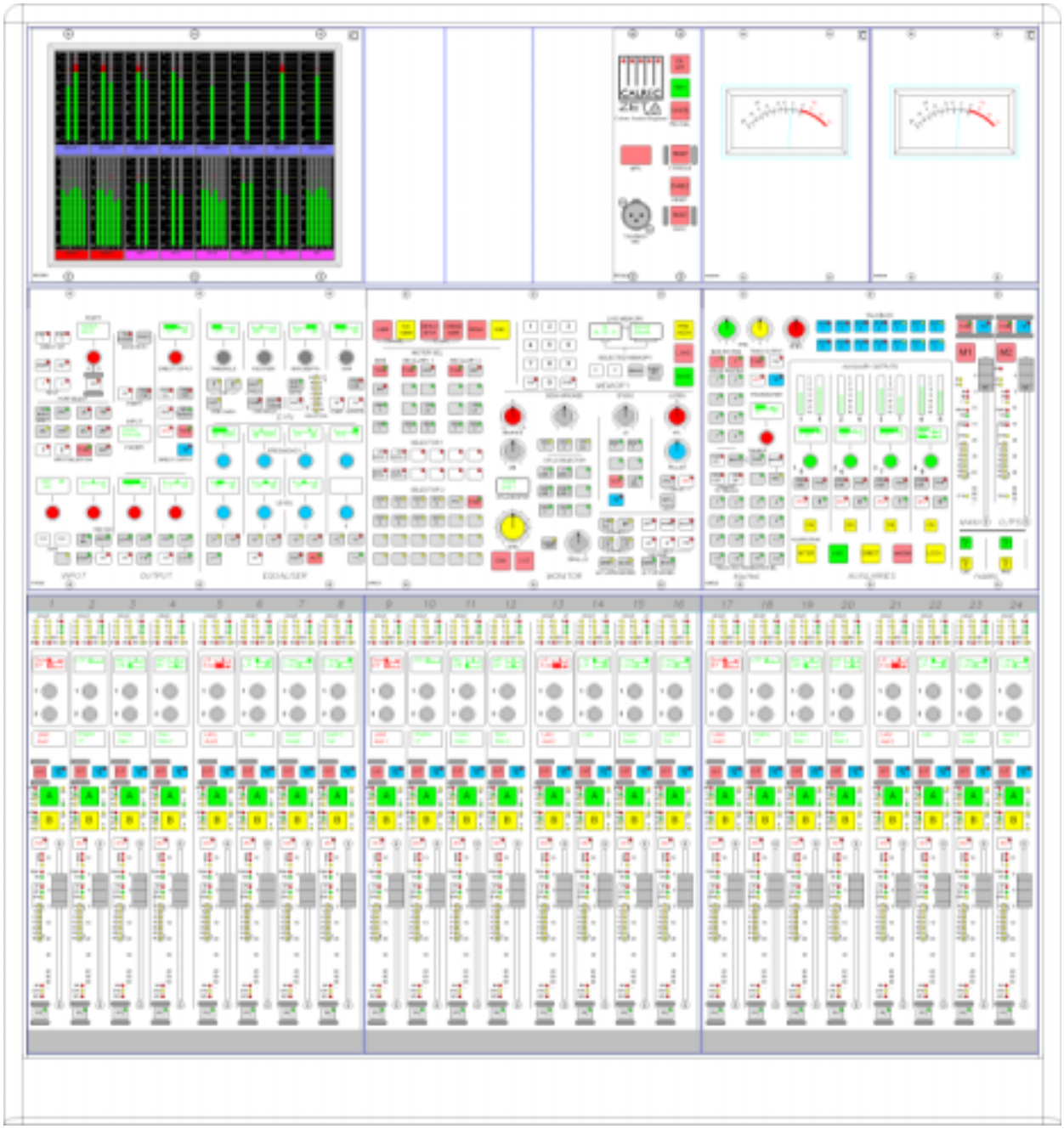
PERFORMANCE	
Digital to Digital (AES/EBU) Distortion	-1dBFS, 20Hz to 10kHz - Better than 0.002%
Digital to Digital (with SRC) Distortion	-1dBFS, 20Hz to 10kHz - Better than 0.005%
Frequency Response (Analogue Input to Output)	20Hz to 20kHz +/- 0.5dB
SYNCHRONISATION	
48kHz synchronisation from	NTSC/PAL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

ENVIRONMENTAL CONSIDERATIONS		
	Operating	**Non-Operating**
Temperature Range	0°C to +30°C (32°F to +86°F)	-20°C to +60°C (-4°F to +140°F)
Relative Humidity	25% to 80% Non-condensing	0% to 90% Non-condensing
Maximum Altitude	2,000 Metres (6500ft)*	15,000 Metres (49,000ft)

* This is the limit to which the safety tests are valid

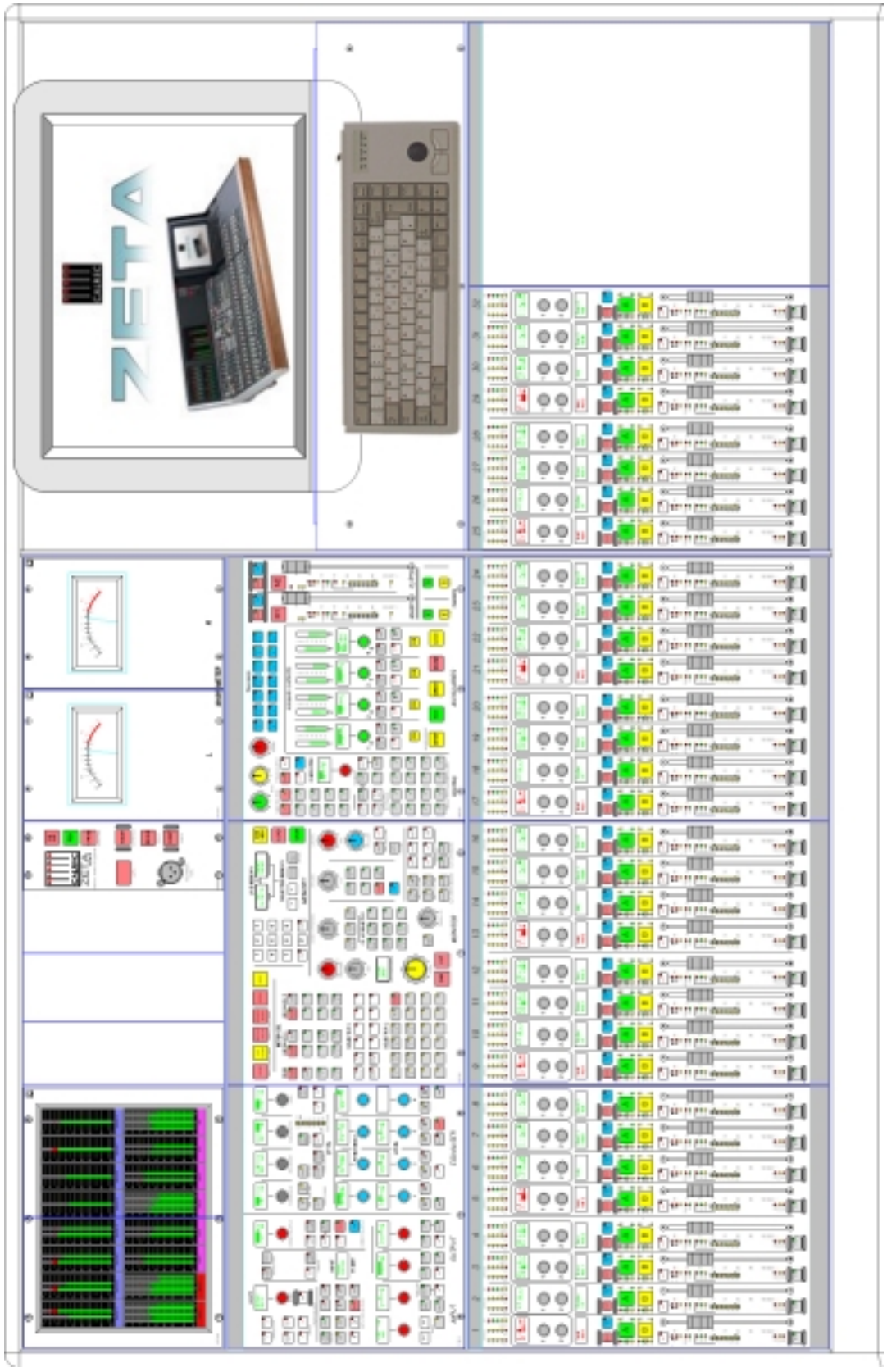
Frame Options and Dimensions

24 FADER FRAME TYPICAL LAYOUT



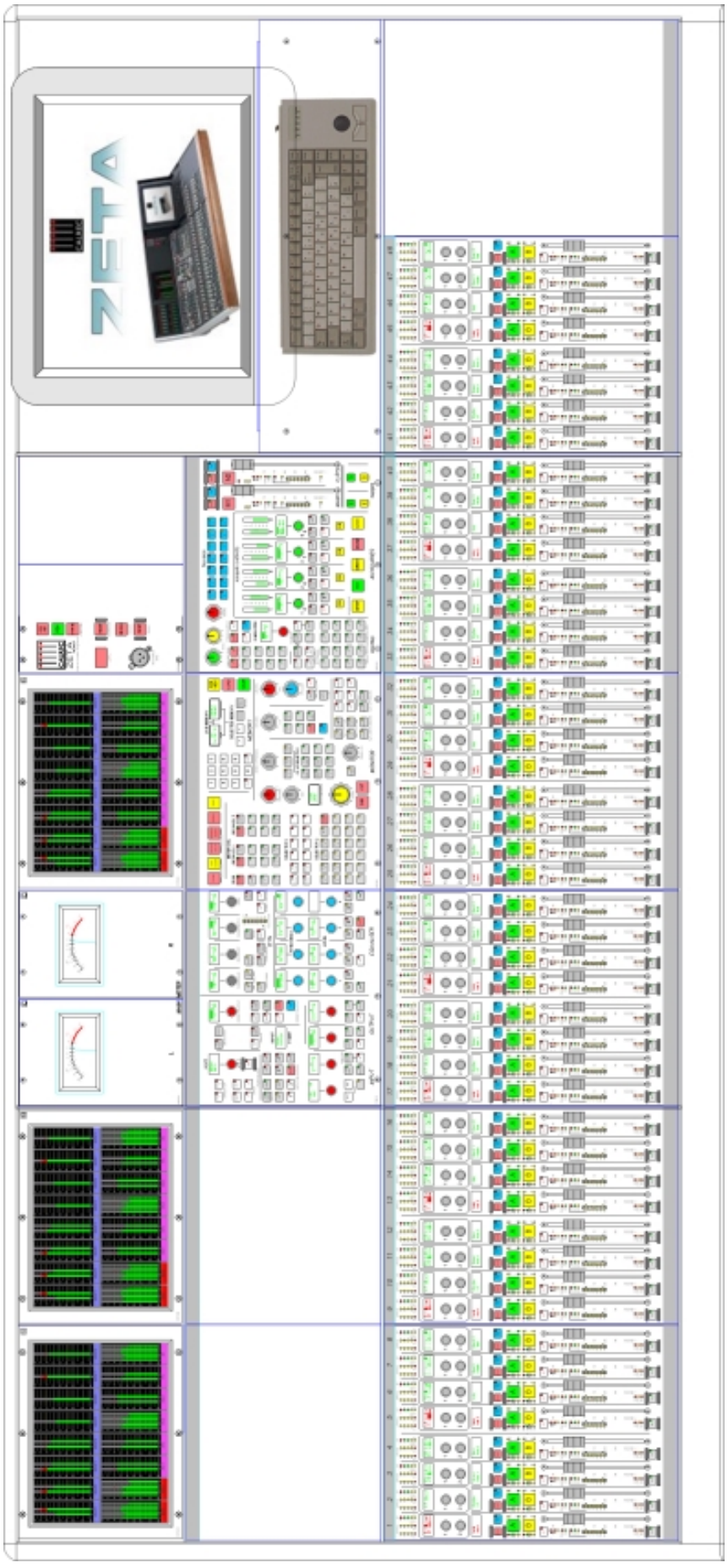
The smallest frame houses up to 24 faders, which allows up to 48 “Channel Faders” within a frame only 784mm (30.9 inches) wide. Due to it’s compact size, the colour touch screen, keyboard and trackerball need to be housed separately.

32 FADER FRAME TYPICAL LAYOUT



The medium sized frame houses up to 40 faders, which allows up to 80 “Channel Faders” within a frame only 1290mm (50.8 inches) wide.

48 FADER FRAME TYPICAL LAYOUT

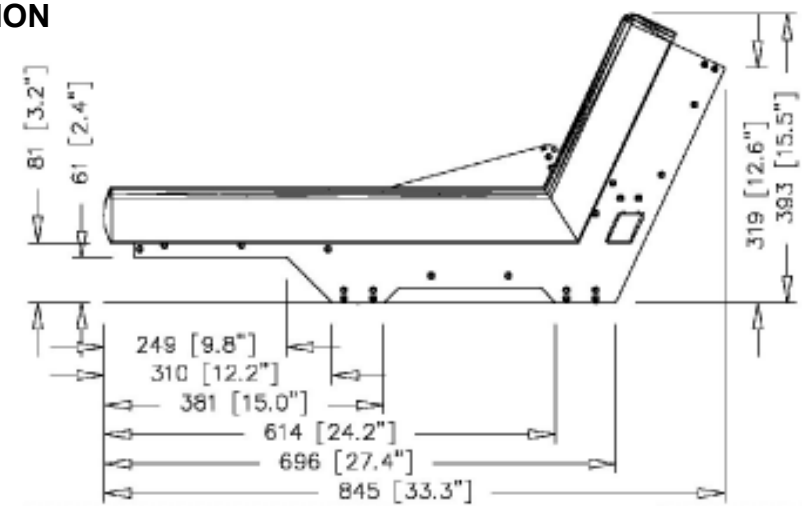


The largest frame houses up to 48 faders (the maximum number possible), which allows up to 96 “Channel Faders” within a frame only 1796mm (70.7 inches) wide.

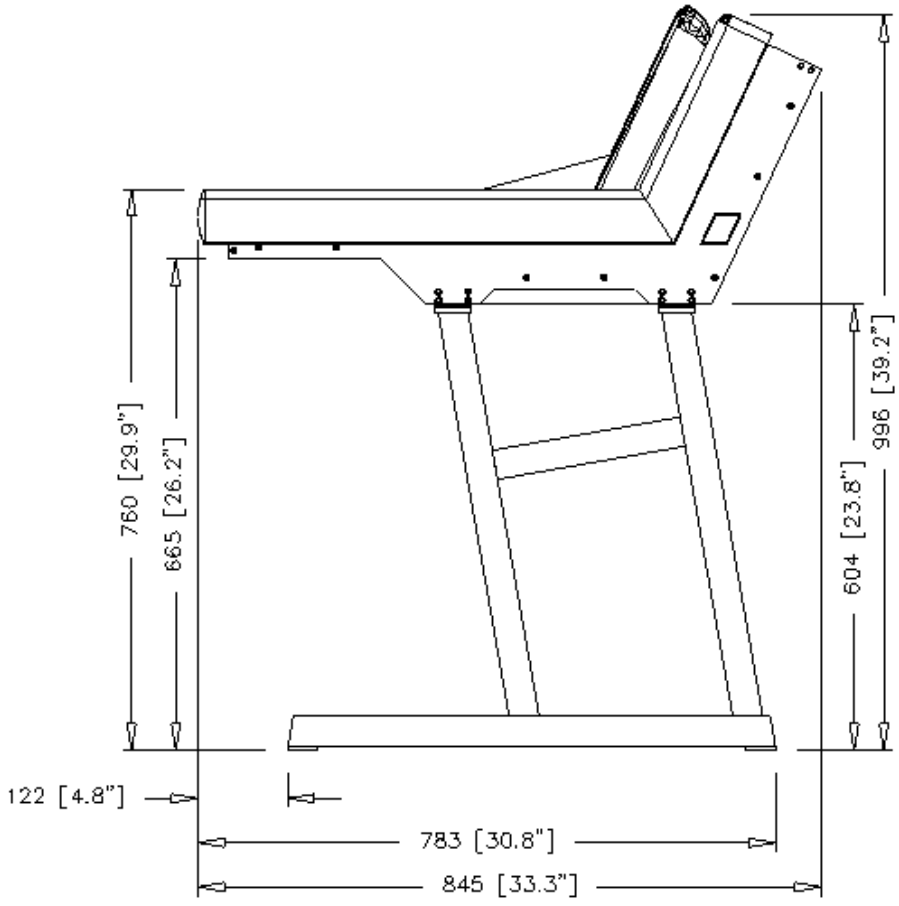
CONSOLE PLAN DIMENSIONS

Frame Size	Length		Depth	
	inches	mm	inches	mm
24 Fader Frame	30.9	784	33.3	845
32 Fader Frame	50.8	1290	33.3	845
48 Fader Frame	70.7	1796	33.3	845

END ELEVATION

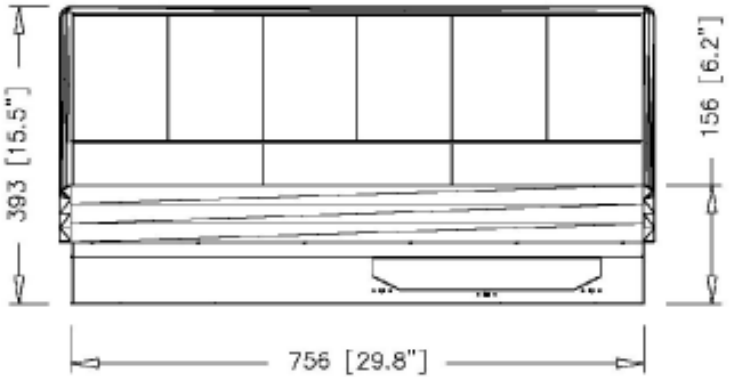


The end profile is the same for all three frame sizes. An optional floor stand is available.

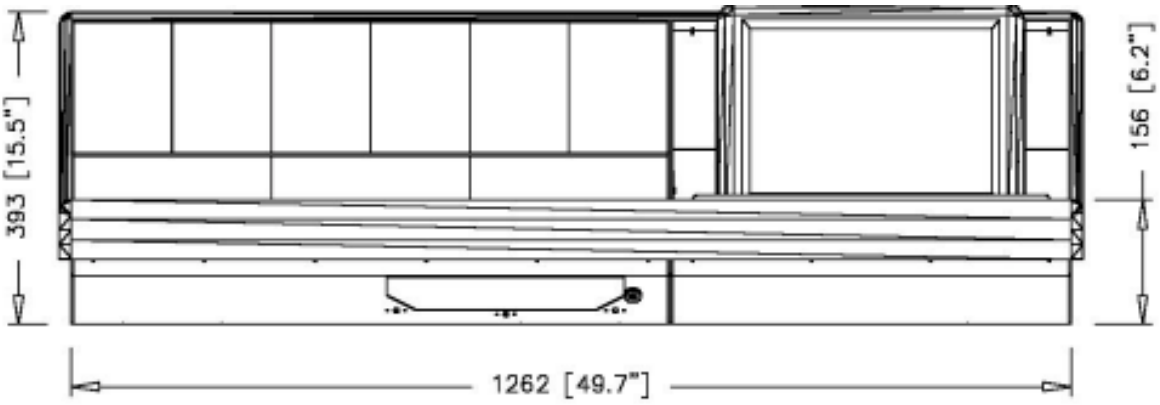


FRONT ELEVATION

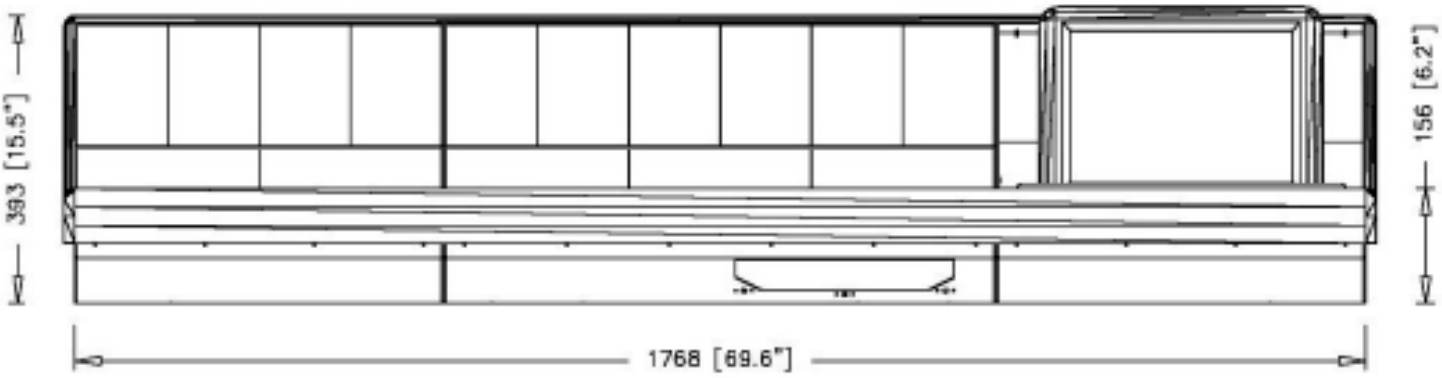
24 FADER



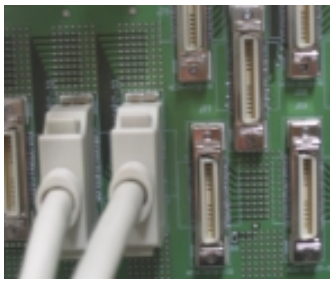
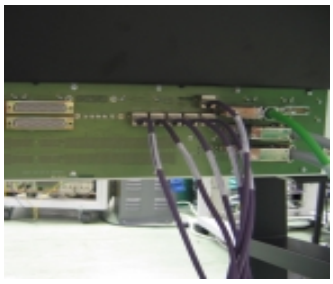
32 FADER



48 FADER

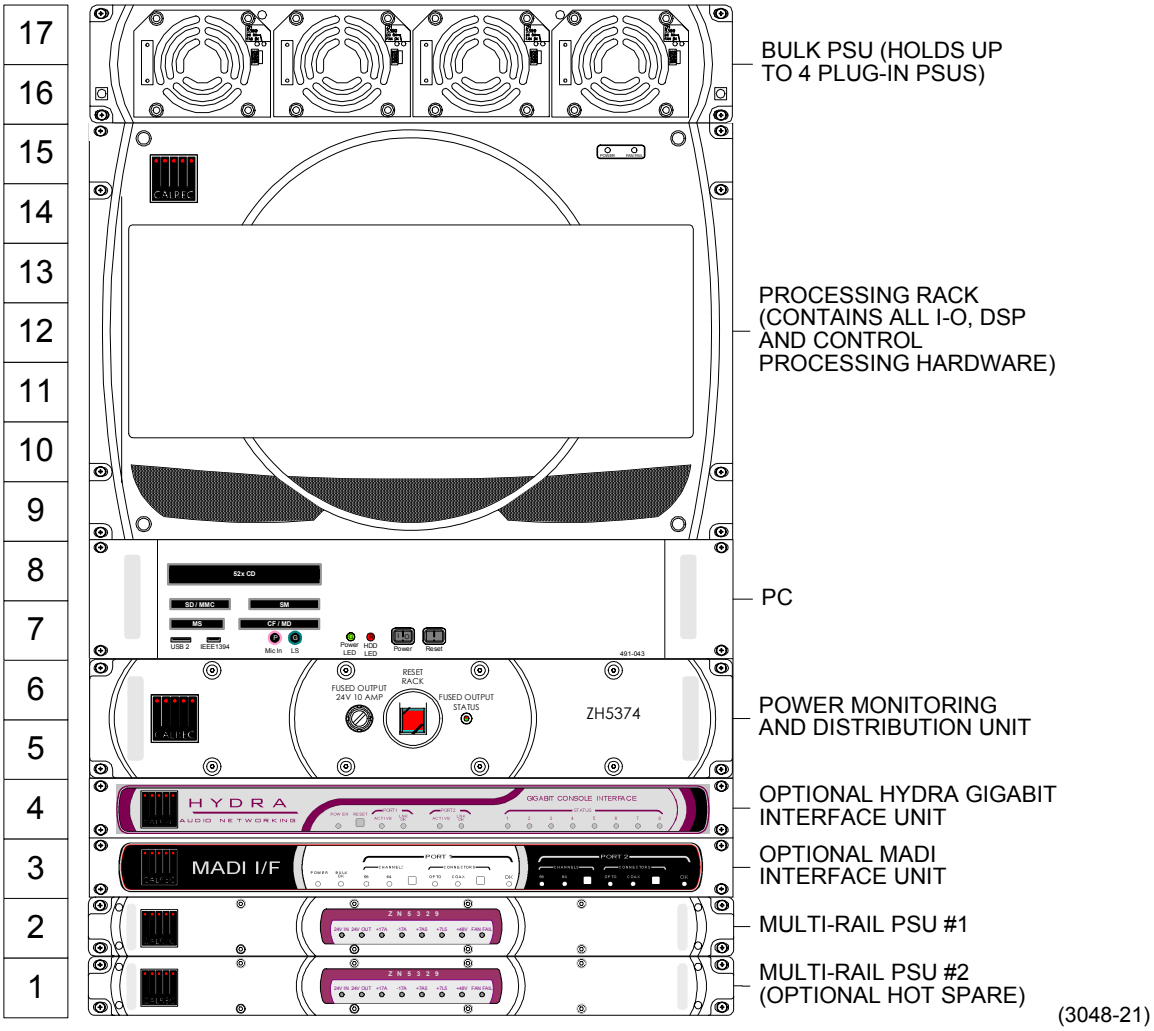


Equipment Installation Information

RACK SPECIFICATIONS

The company recommends 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.



(3048-21)

Item	Height	Approx depth (incl. mating cons)		Approx weight		Approx Power Output (W) (full load)	Approx AC Power (VA) (full load)
		inches	mm	lbs	kgs		
Bulk PSU rack with one PSU*	2U	18.5	470	17.5	8	1000	1250
Power for Bulk PSU Hot spare	-	-	-	-	-	No extra	Less than 5% extra
Processing Rack (Unpopulated)	7U	19.7	500	29.5	13.4	-	-
Processing Rack (Populated)	7U	19.7	500	53.2	24.2	-	-
PC*	2U	23.7	600	27	12.2	-	400
PSU Monitor & Distribution Unit *	2U	19.1	485	11.5	5.2	-	-
Hydra Gigabit Interface Unit	1U	10.4	265	6	2.7	-	-
MADI Unit	1U	11.9	300	7	3.2	-	-
Multi-Rail PSU *	1U	18.1	460	9.3	4.23	-	-
Power for Multi-Rail PSU Hot spare	-	-	-	-	-	No extra	Less than 5% extra

* Note: Unit has handles protruding approx 1.3” (32mm) from the surface of the front panel.

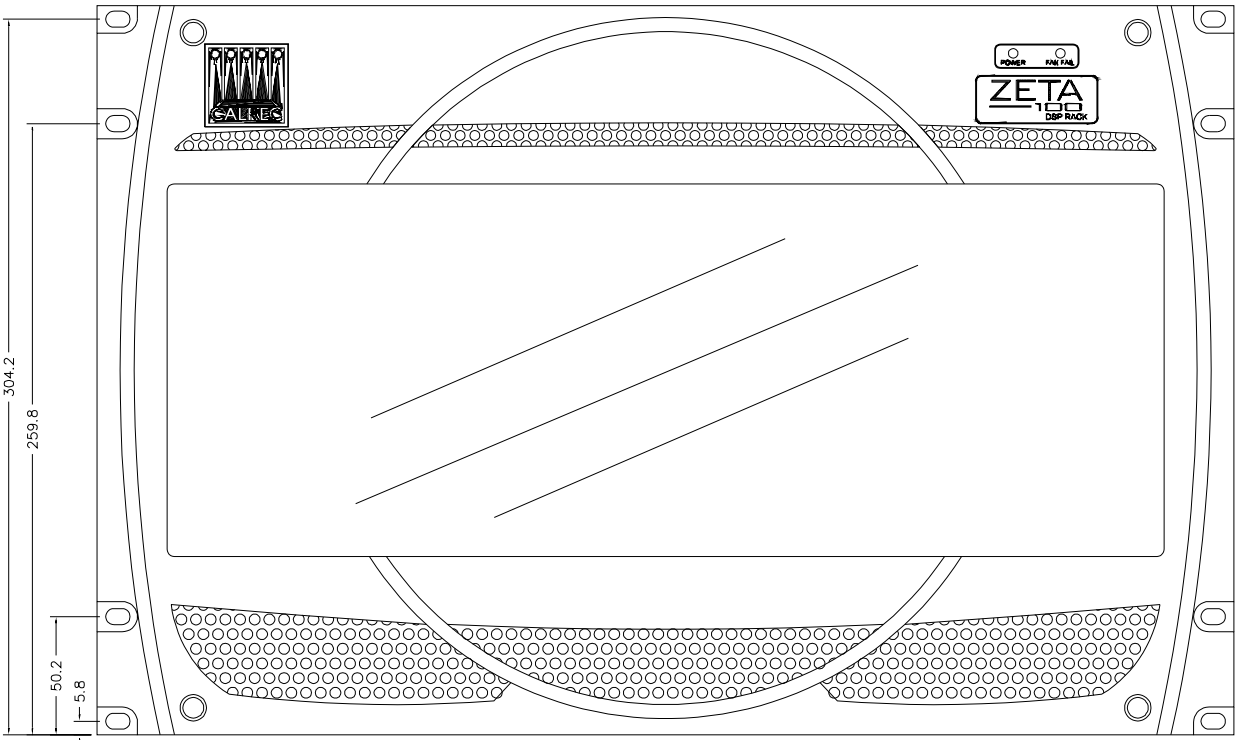
PROCESSING RACK

The 7U Processing rack houses the system's DSP, input, output and control cards. Incorporated into the rack is a built-in low noise fan tray, situated above the processing area. The fan tray incorporates a baffle such that warm air is drawn out of the rack and out through the rear of the fan tray.

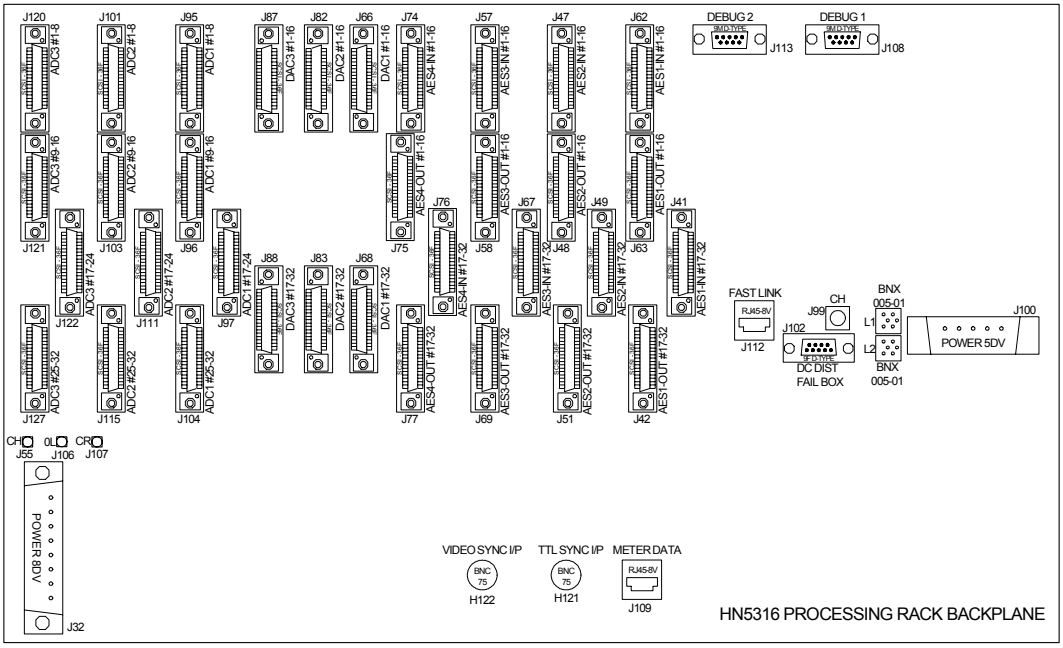
- 8 slots for DSP Cards
- 2 slots for Processor Cards
- 3 slots for ADC (Analogue Input) Cards
- 3 slots for DAC (Analogue Output) Cards
- 4 slots for AES I/O cards, 3 of which can house Wide Area Bulk Cards

This unit should be secured into the front of the bay by the four fixing holes in each of the two front angles. The unit should always be mounted in a horizontal position, located into an equipment bay which offers mechanical support from underneath, and not supported by the front flanges alone.

FRONT

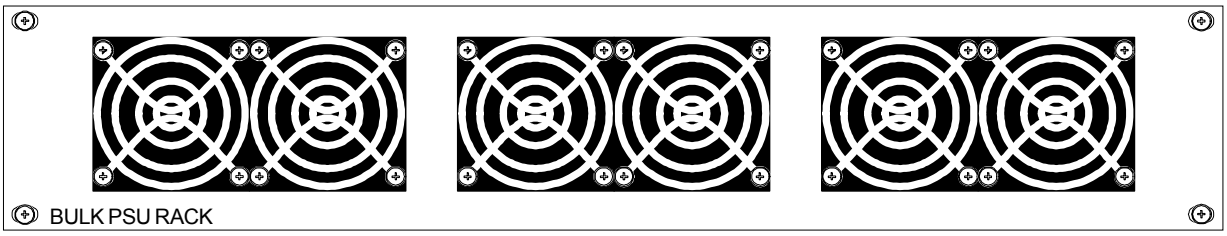


REAR

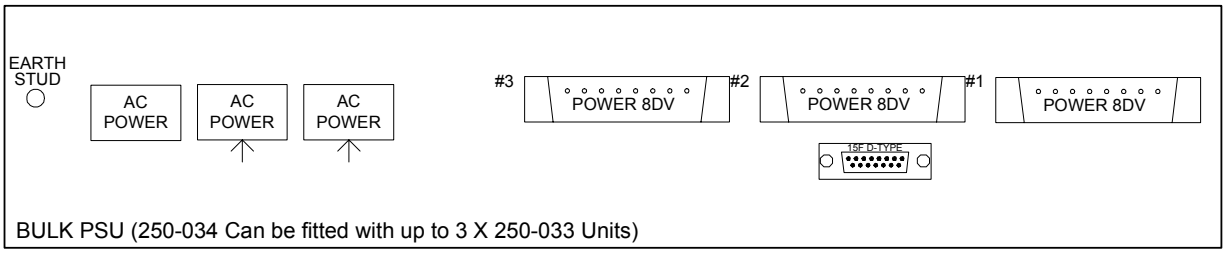


BULK PSU

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 digital components within the Processing Rack are powered as one unit from one 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.

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.

Mounting Instructions

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.

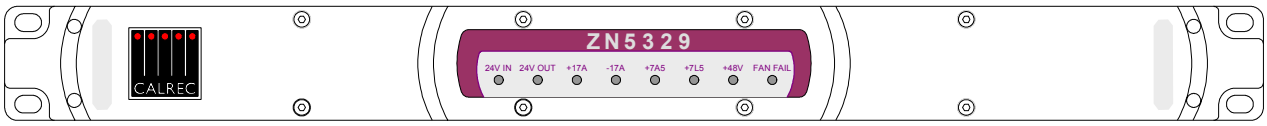
System Fan Noise (dB SPL A-Weighted)

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

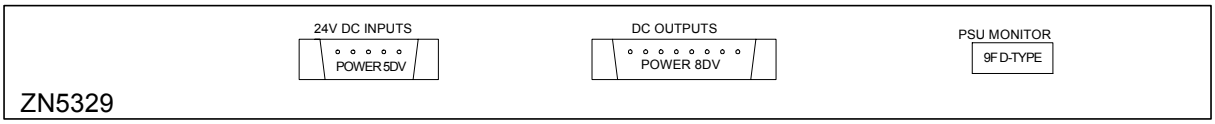
Bulk PSU Rack	
1 x 24V 1kW PSU	49dBA
2 x 24V 1kW PSU	52dBA
3 x 24V 1kW PSU	54dBA

MULTI-RAIL POWER SUPPLY UNIT

FRONT



REAR

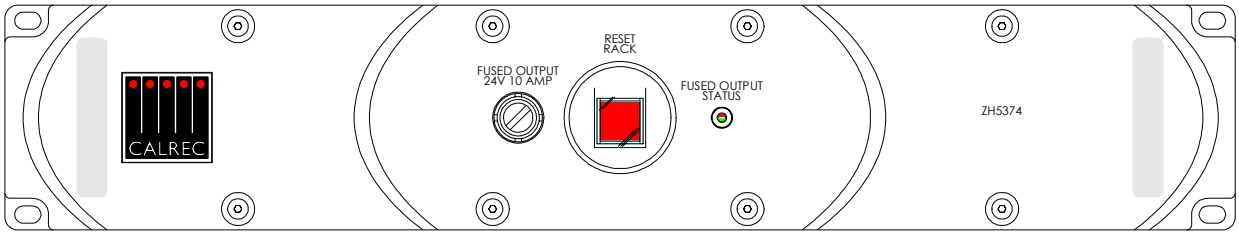


The analogue components in the system are powered using 1U Multi-Rail PSUs. Diode feeding allows supplies of the same type to be parallelled together. The number required is dependent upon the size of the system, and the "hot spare" requirement. All hot spare units are optional. The units are fan cooled using low noise fans, drawing air from side to side through the PSU instead of in from the front. 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.

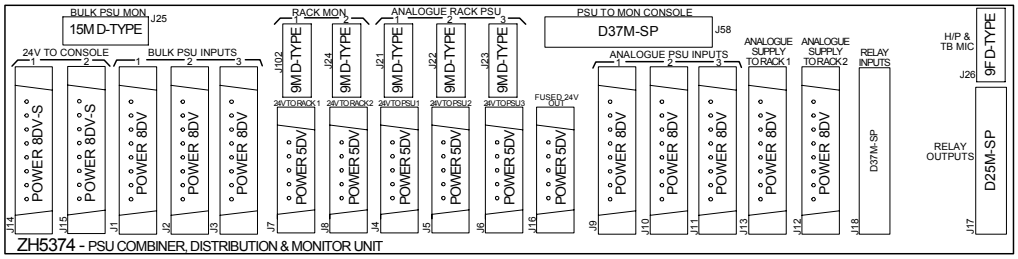
This unit should be secured into the front of the bay by the two standard fixing holes in each of the two 1RU front angles. The unit should always be mounted in a horizontal position. In outside broadcast situations, the unit should ideally be located in an equipment bay which offers mechanical support from underneath.

PSU MONITORING AND DISTRIBUTION UNIT

FRONT



REAR



The Power Monitoring and Distribution rack performs many functions. It monitors the power supplies for failures, and ensures "hot" changeover to the spare (if fitted) should a fault develop. In addition to connections for power combining and distribution, the module includes:

- A front-mounted rack reset button.
- 8 x changeover relays intended for switching balanced talkback audio.
- 2 x RS422 to RS232 converters to interface the rack control processors to the PC.
- Opto-isolated fan fail and PSU fail inputs.

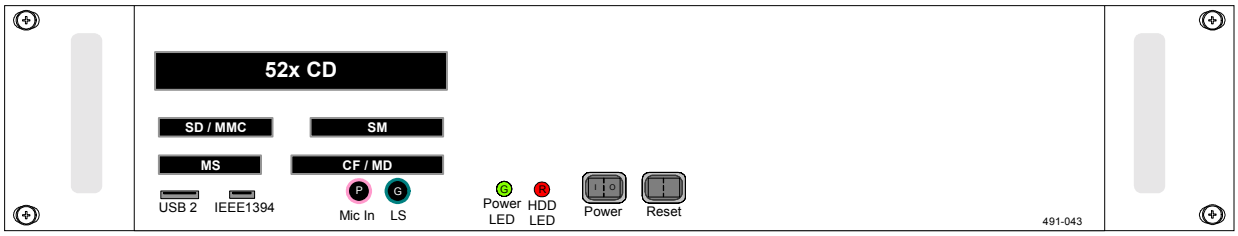
The Reset button reboots the racks only, the control surface is unaffected.
PLEASE NOTE: Resetting the racks will result in a brief audio interruption.

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.

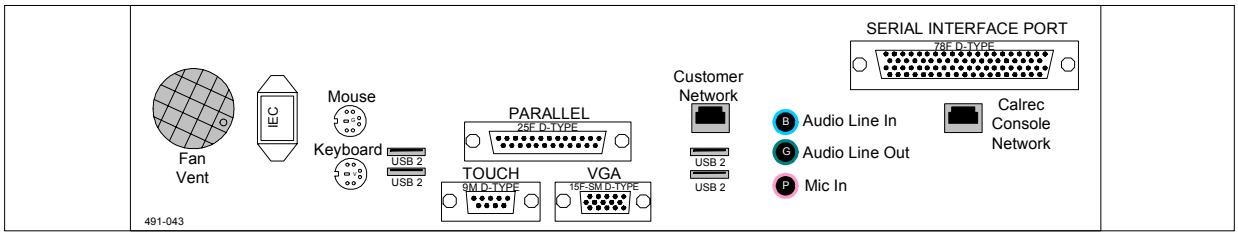
PC INFORMATION

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 and 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 Zeta console software will be pre-installed, and supplied seperately 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

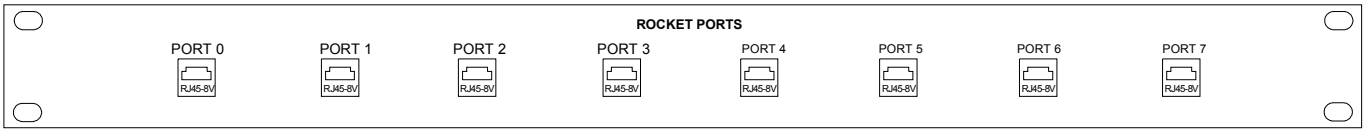
A number of flash card slots are provided on the front of the PC for file backup. In addition, backup could also be to a customer's LAN or to a USB device which can be plugged into the front or rear of the PC. It is recommended that the following files are backed up in case of PC failure:

Filename	Description
C:\Zeta\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:\Zeta\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:\Zeta\Cust1\Options\Options.bin (Or **C:\Zeta100\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:\Zeta\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:\Zeta\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:\Zeta\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:\Zeta100\Cust1\A100fe1.ini** **C:\Zeta100\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.

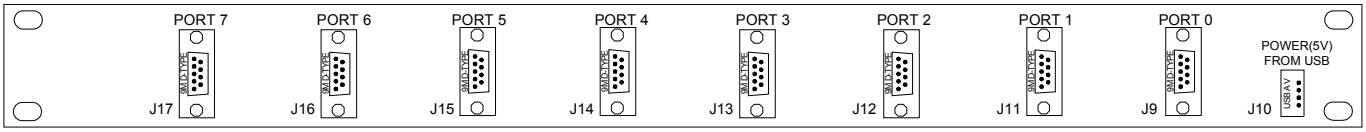
RS232/RS422 Interface Panel

This unit should be secured into the rear of the bay by the two standard fixing holes in each of the two 1RU front angles.

Front

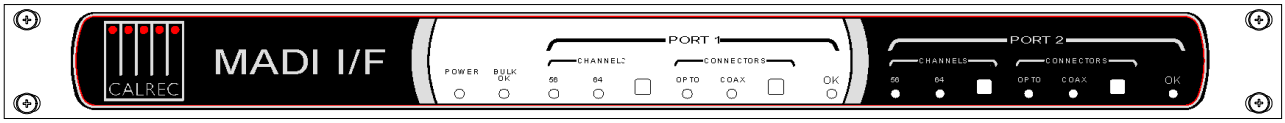


Rear



OPTIONAL I/O EXPANSION VIA WIDE AREA INTERFACES

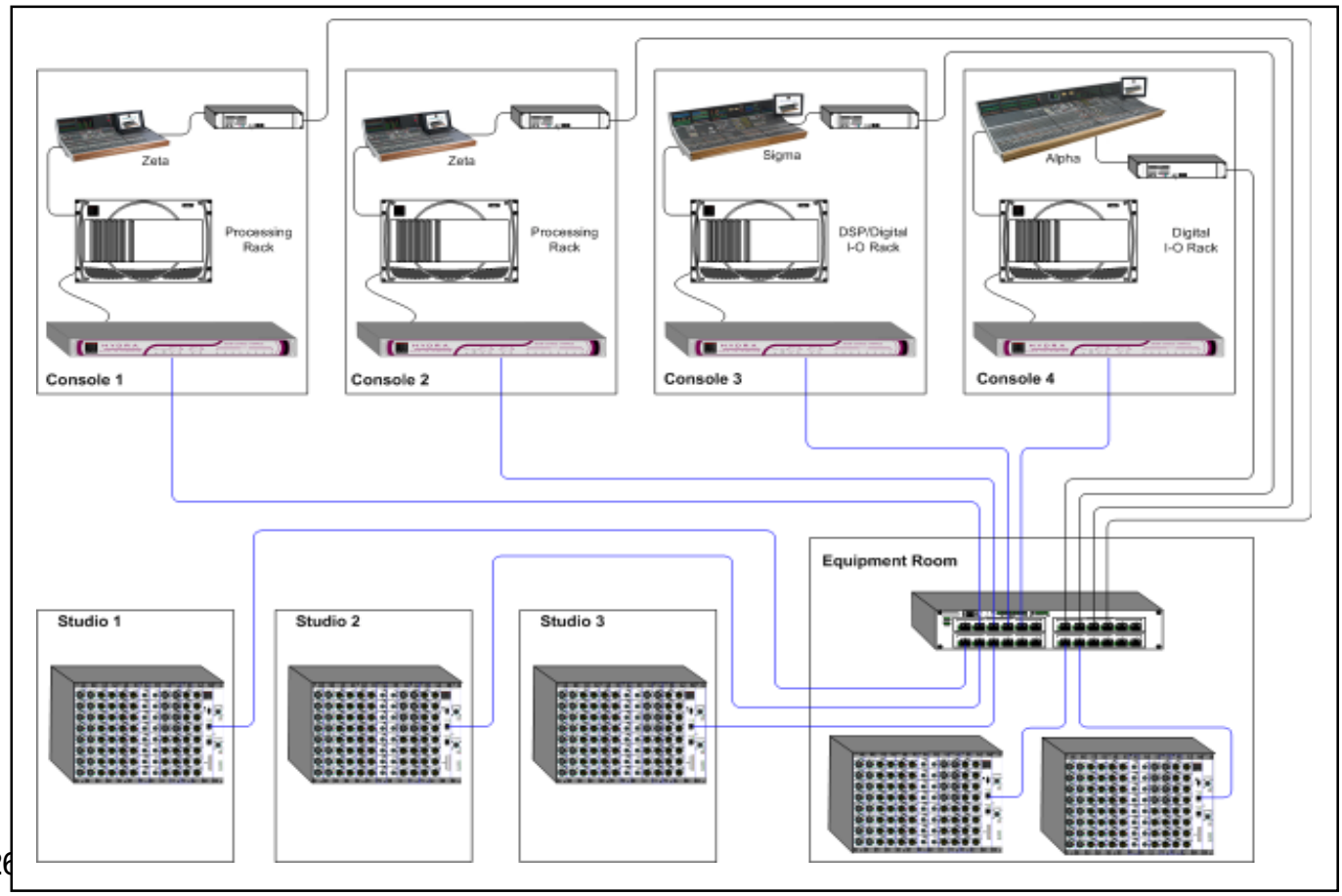
MADI



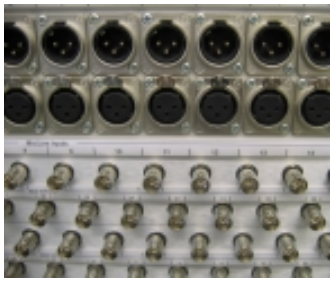
The rack mounted MADI unit contains two independent AES10 MADI compatible interfaces, and is available as an option. The two ports are interfaced to the console via a Wide Area Bulk (WAB) card, which occupies one of the AES card slots in the DSP/Digital I/O rack. Each MADI interface can operate in either 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.

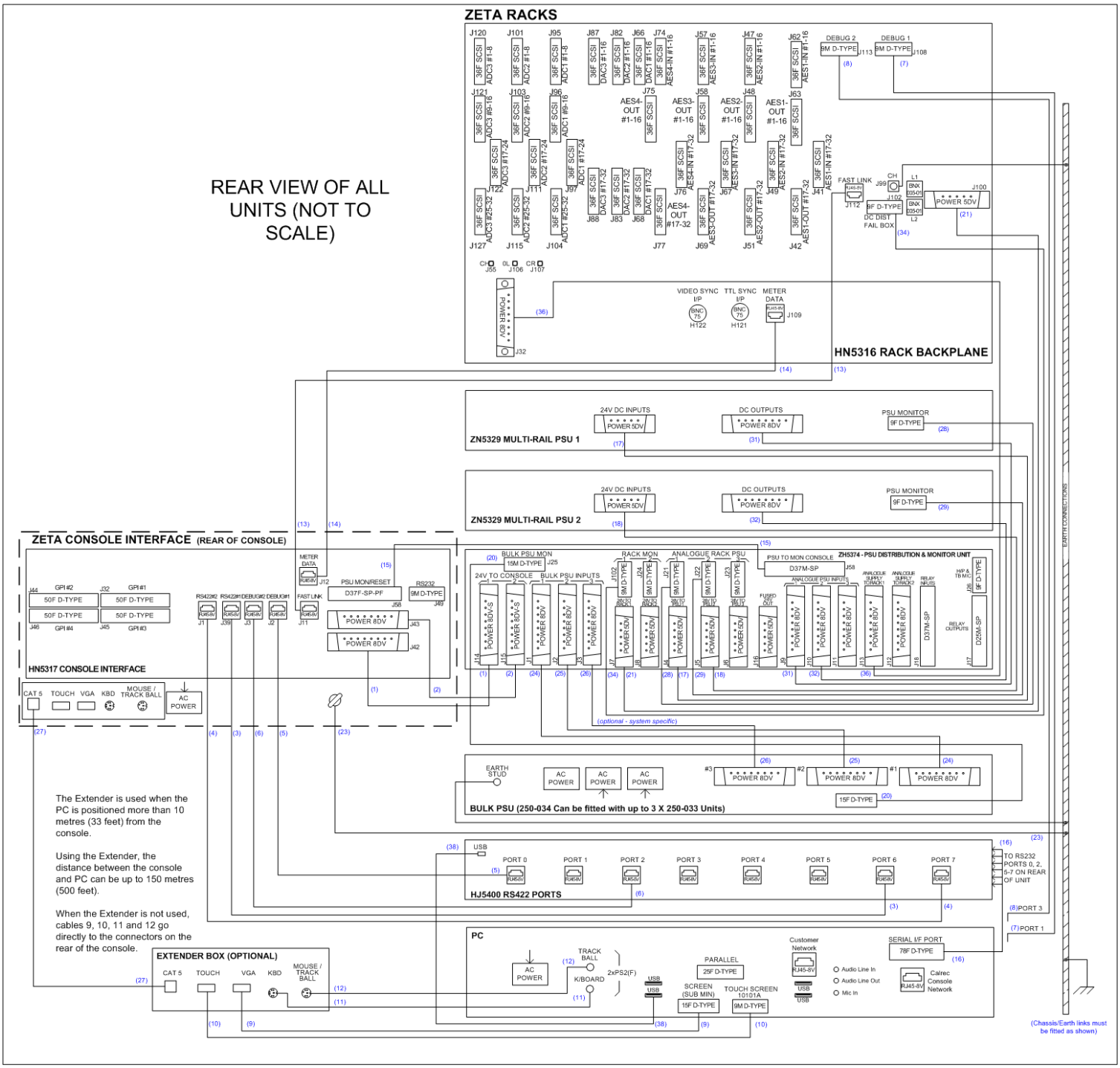


Wiring and Cabling Information



CONSOLE AND RACK WIRING DIAGRAM

This diagram shows the rear of all units and how they are connected together. Please refer to the wiring schedule and the maximum cable lengths table on the next page for connection details.



CONSOLE AND RACK WIRING SCHEDULE

CABLE No	FROM	CONN.	CONN. TYPE	TO	CONN.	CONN. TYPE	CIRCUIT
1	ZH5374	J14	8way D (M)	HN5317	J42	8way D(F)	Console DC pwr 1
2	ZH5374	J15	8way D (M)	HN5317	J43	8way D(F)	Console DC pwr 2
3	HJ5400	PORT #0	RJ45	HN5317	J2	RJ45	Console debug 1
4	HJ5400	PORT #2	RJ45	HN5317	J3	RJ45	Console debug 2
5	HJ5400	PORT #6	RJ45	HN5317	J39	RJ45	Console RS422-1
6	HJ5400	PORT #7	RJ45	HN5317	J1	RJ45	Console RS422-2
7	PC	LAVA PORT #2	9way D(F)	HN5316	9way D(F)	420-746	Rack debug 1
8	PC	LAVA PORT #4	9way D(F)	HN5316	9way D(F)	420-746	Rack debug 2
9	PC	SCREEN	15way HDD(M)	Scrn Repeater	VGA	15way HDD(M)	Console screen
10	PC	10101A	9way D(F)	Scrn Repeater	Touch	9way D(M)	C.Touch Screen
11	PC	KBD	PS2	Scrn Repeater	Keyboard	PS2	Console keyboard
12	PC	MOUSE	PS2	Scrn Repeater	Mouse	PS2	Console trackball
13	HN5316	J112	RJ45	HN5317	J11	RJ45	C.RS422 FAST
14	HN5316	J109	RJ45	HN5317	J12	RJ45	C.Meter Data
15	ZH5374	J58	37way D(M)	HN5317	J58	37way D(F)	Console PSU fail
16	HJ5400 (REAR)	PORTS 1, 3, 5-8	6x9way D(M)	PC	Serial I/F	78way HDD(F)	LAVA PORT Lead
17	ZH5374	J4	5way D(M)	ZN5329 #1	24V DC I/P	5way D(F)	24V To Analogue PSU1
18	ZH5374	J5	5way D(M)	ZN5329 #2	24V DC I/P	5way D(F)	24V To Analogue PSU2
19 (Not Shown)	ZH5374	J6	5way D(M)	ZN5329 #3	24V DC I/P	5way D(F)	24V To Analogue PSU3
20	Bulk PSU	D1	15way D(M)	ZH5374	J25	15way D(F)	Racks PSU mon
21	ZH5374	O/P 1	5way D(M)	HN5316	J100	5way D(F)	24V to Rack
23	Eqpt Bay			Console			System Earth
24	Bulk PSU	O/P 1	8way D(M)	ZH5374	J1	8way D(F)	Bulk Output 1
25	Bulk PSU	O/P 2	8way D(M)	ZH5374	J2	8way D(F)	Bulk Output 2
26	Bulk PSU	O/P 3	8way D(M)	ZH5374	J3	8way D(F)	Bulk Output 3
27	PC Extender	Cat 5	RJ45	PC Extender	Cat 5	RJ45	PC Extender CAT 5
28	ZN5329 #1	PSU MON	9way D(M)	ZH5374	J21	9way D(F)	PSU fail
29	ZN5329 #2	PSU MON	9way D(M)	ZH5374	J22	9way D(F)	PSU fail
30 (Not Shown)	ZN5329 #3	PSU MON	9way D(M)	ZH5374	J23	9way D(F)	PSU fail
31	ZN5329 #1	O/P 1	8way D(M)	ZH5374	J9	8way D(F)	Analogue PSU1
32	ZN5329 #2	O/P 2	8way D(M)	ZH5374	J10	8way D(F)	Analogue PSU2
33 (Not Shown)	ZN5329 #3	O/P 3	8way D(M)	ZH5374	J11	8way D(F)	Analogue PSU3
34	HN5316	J102	9way D(M)	ZH5374	J102	9way D(F)	Rack DC Mon
36	ZH5374	J13	8way D(M)	HN5316	J32	8way D(F)	Analogue to rack

For systems with just one multi-rail PSU, cables 18,19, 29,30,32 and 33 are not fitted.
For systems with two multi-rail PSUs, cables 19, 30 and 33 are not fitted.
For systems with three multi-rail PSUs, all cables in the table are fitted.

Maximum Cable Lengths

Cables from	To	Maximum Length	
		Feet	Metres
Control surface	PC	500	150
Control surface	Processing Rack	500	150
Control Surface *	Power Monitoring & Distribution Unit	100	30
Power Supplies	Power Monitoring & Distribution Unit	16.5	5
Processing Rack	Power Monitoring & Distribution Unit	16.5	5
Processing Rack	PC	100	30
Processing Rack	BNC/XLR I/O Interface Panels	9.8	3
Processing Rack	EDAC I/O Interface Panels	9.8	3
Processing Rack	MADI Unit	16.5	5
Processing Rack	Hydra Gigabit Interface Unit	16.5	5

* For longer distances, the control surface requires a local power supply.

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.

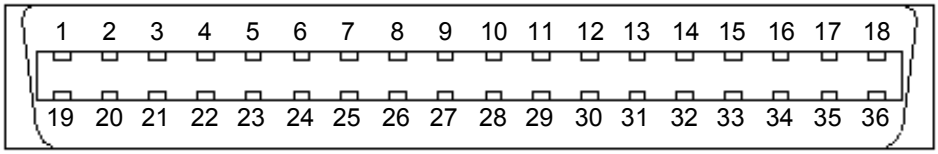
At the point of cable termination, remove only the minimum amount of cable sleeve/jacket. This ensures that the twist rate and lay of the core pairs within the cable are maintained for as much of the transmission path as possible. The twist rate of each pair of cable cores should also be maintained to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

SPECIFICATION FOR 36W SCSI STYLE CABLING

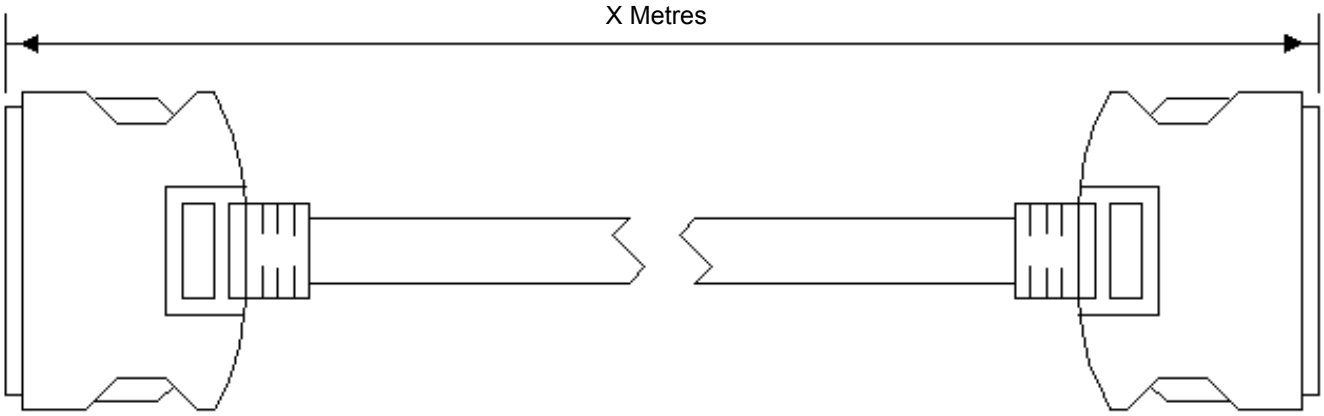
CABLE PAIRS WIRED AS:
1 . 19
2 . 20
3 . 21
4 . 22
5 . 23
6 . 24
7 . 25
8 . 26
9 . 27
10 . 28
11 . 29
12 . 30
13 . 31
14 . 32
15 . 33
16 . 34
17 . 35
18 . 36

FRONT VIEW OF MATING CONNECTOR



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

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



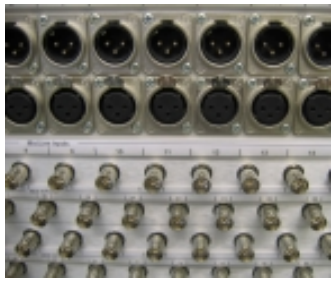
36W MDR PLUG
3M10136-6000EL
OR EQUIVALENT

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

STOCK CODES

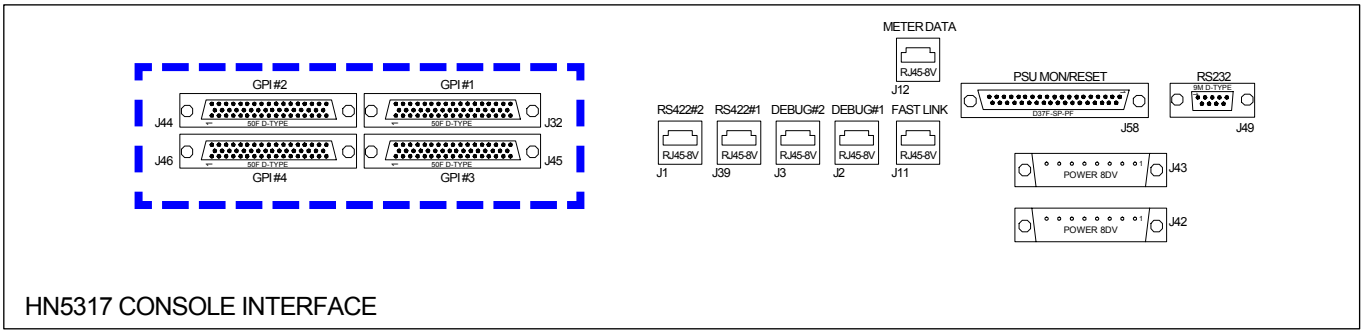
312-079	1M
312-078	3M
312-077	5M

External Connections



GPIO CONNECTIONS

Connections to the general purpose inputs and outputs are provided on 50 way female D-Type connectors on the rear of the console. 32 opto inputs, 16 opto outputs and 40 Darlington outputs are available.



HN5317 CONSOLE INTERFACE

GPI #1

Pins	Circuit
1 . 18	5L
34 . 2	Opto 1 IN
19 . 35	Opto 2 IN
3. 20	Opto 3 IN
36 . 4	Opto 4 IN
21 . 37	Opto 5 IN
5 . 22	Opto 6 IN
38 . 6	Opto 7 IN
23 . 39	Opto 8 IN
7 . 24	0L
40 . 8	5L
25 . 41	Opto 1 OUT
9 . 26	Opto 2 OUT
42 . 10	Opto 3 OUT
27 . 43	Opto 4 OUT
11 . 28	0L
44 . 12	5L
29 . 45	D OUT 1/2
13 . 30	D OUT 3/4
46 . 14	D OUT 5/6
31 . 47	D OUT 7/8
15 . 32	D OUT 9/10
48 . 16	NC
33 . 49	0L
17 . 50	CHASSIS

GPI #2

Pins	Circuit
1 . 18	5L
34 . 2	Opto 9 IN
19 . 35	Opto 10 IN
3. 20	Opto 11 IN
36 . 4	Opto 12 IN
21 . 37	Opto 13 IN
5 . 22	Opto 14 IN
38 . 6	Opto 15 IN
23 . 39	Opto 16 IN
7 . 24	0L
40 . 8	5L
25 . 41	Opto 5 OUT
9 . 26	Opto 6 OUT
42 . 10	Opto 7 OUT
27 . 43	Opto 8 OUT
11 . 28	0L
44 . 12	5L
29 . 45	D OUT 11/12
13 . 30	D OUT 13/14
46 . 14	D OUT 15/16
31 . 47	D OUT 17/18
15 . 32	D OUT 19/20
48 . 16	NC
33 . 49	0L
17 . 50	CHASSIS

GPI #3

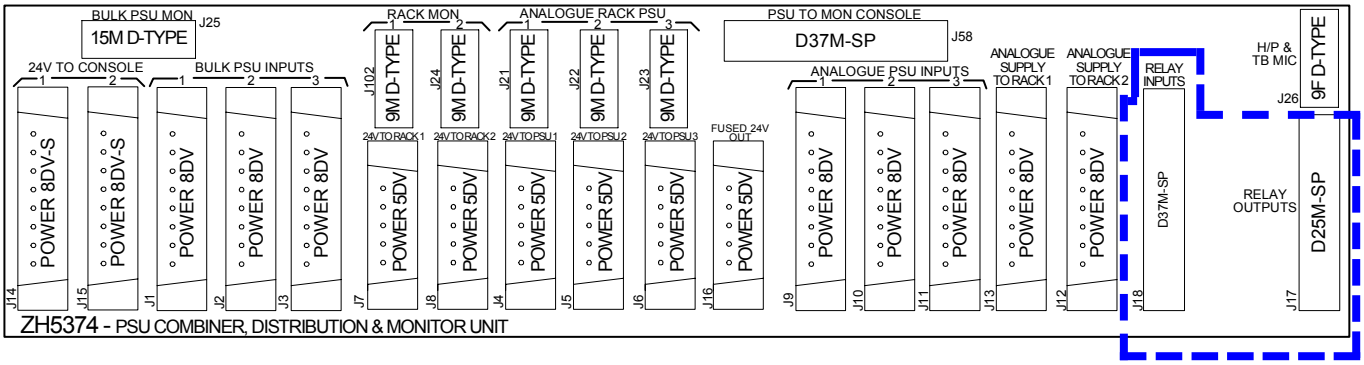
Pins	Circuit
1 . 18	5L
34 . 2	Opto 17 IN
19 . 35	Opto 18 IN
3. 20	Opto 19 IN
36 . 4	Opto 20 IN
21 . 37	Opto 21 IN
5 . 22	Opto 22 IN
38 . 6	Opto 23 IN
23 . 39	Opto 24 IN
7 . 24	0L
40 . 8	5L
25 . 41	Opto 9 OUT
9 . 26	Opto 10 OUT
42 . 10	Opto 11 OUT
27 . 43	Opto 12 OUT
11 . 28	0L
44 . 12	5L
29 . 45	D OUT 21/22
13 . 30	D OUT 23/24
46 . 14	D OUT 25/26
31 . 47	D OUT 27/28
15 . 32	D OUT 29/30
48 . 16	NC
33 . 49	0L
17 . 50	CHASSIS

GPI #4

Pins	Circuit
1 . 18	5L
34 . 2	Opto 25 IN
19 . 35	Opto 26 IN
3. 20	Opto 27 IN
36 . 4	Opto 28 IN
21 . 37	Opto 29 IN
5 . 22	Opto 30 IN
38 . 6	Opto 31 IN
23 . 39	Opto 32 IN
7 . 24	0L
40 . 8	5L
25 . 41	Opto 13 OUT
9 . 26	Opto 14 OUT
42 . 10	Opto 15 OUT
27 . 43	Opto 16 OUT
11 . 28	0L
44 . 12	5L
29 . 45	D OUT 31/32
13 . 30	D OUT 33/34
46 . 14	D OUT 35/36
31 . 47	D OUT 37/38
15 . 32	D OUT 39/40
48 . 16	NC
33 . 49	0L
17 . 50	CHASSIS

Opto Specification - 5-24V
Darlington Specification - 30V, 5mA

8 change over relays are also available on the rear of the Power Monitoring and Distribution Unit.



Relay Inputs (Connector J18)

Pins	Circuit
1 . 20	Normally Made a/b Relay 1
2 . 21	Normally Open a/b Relay 1
3 . 22	Normally Made a/b Relay 2
4 . 23	Normally Open a/b Relay 2
5 . 24	Normally Made a/b Relay 3
6 . 25	Normally Open a/b Relay 3
7 . 26	Normally Made a/b Relay 4
8 . 27	Normally Open a/b Relay 4
9 . 28	Normally Made a/b Relay 5
10 . 29	Normally Open a/b Relay 5
11 . 30	Normally Made a/b Relay 6
12 . 31	Normally Open a/b Relay 6
13 . 32	Normally Made a/b Relay 7
14 . 33	Normally Open a/b Relay 7
15 . 34	Normally Made a/b Relay 8
16 . 35	Normally Open a/b Relay 8
17 . 36	Chassis
18 . 37	Chassis
19	Chassis

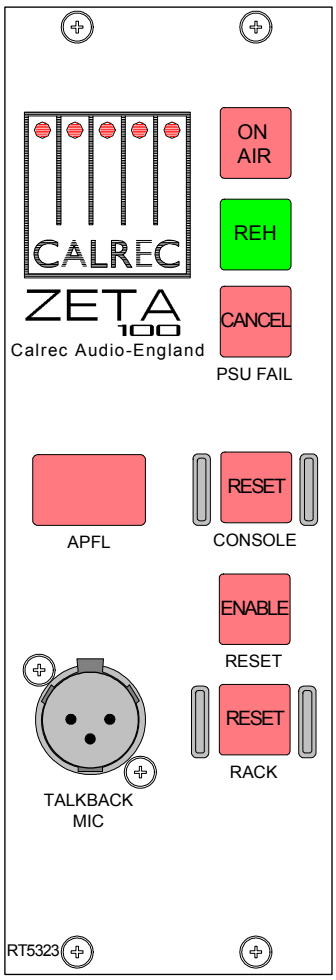
Relay Outputs (Connector J17)

Pins	Circuit
1 . 14	Common a/b Relay 1
2 . 15	Common a/b Relay 2
3 . 16	Common a/b Relay 3
4 . 17	Common a/b Relay 4
5 . 18	Common a/b Relay 5
6 . 19	Common a/b Relay 6
7 . 20	Common a/b Relay 7
8 . 21	Common a/b Relay 8
9 . 22	Chassis
10 . 23	Chassis
11 . 24	Chassis
12 . 25	Chassis
13	Chassis

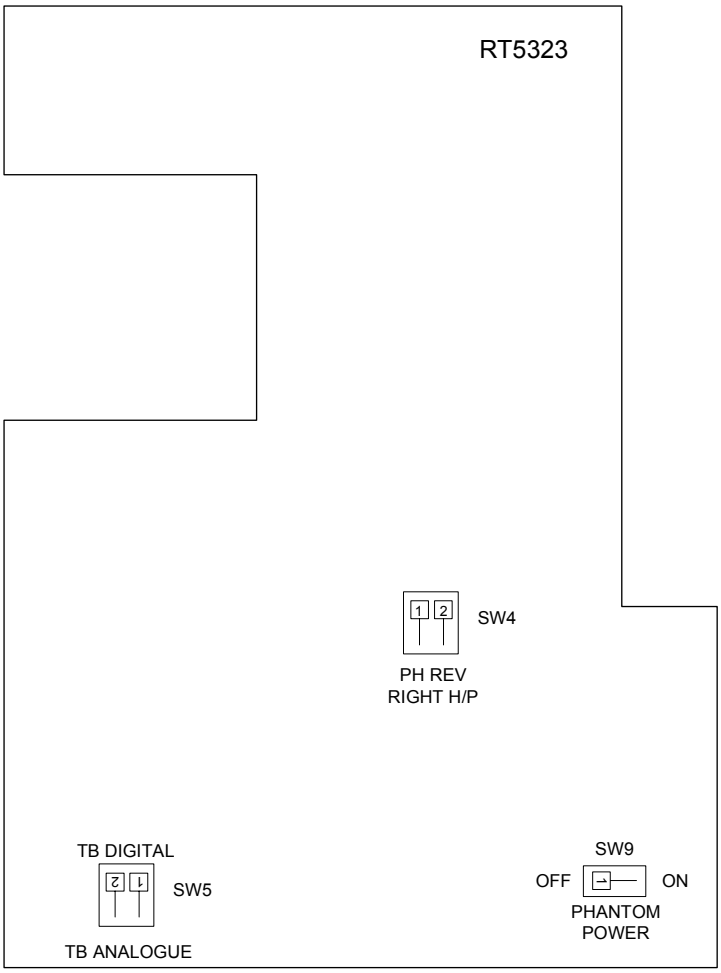
Relay Specification - 50V, 1A (switched power not exceeding 30W)

TALKBACK MICROPHONE & HEADPHONE SIGNAL FORMAT AND CONNECTIONS

Front Panel



DIL Switches



The talkback and headphone signals are carried between the console backplane and the power monitoring and distribution unit using a multi-core cable with a 37-way D-type connector at each end.

- The headphone signal is AES only
- The talkback microphone signal can be AES or analogue

Talkback Mic Connections

The talkback microphone connects to the console via the XLR connector on the reset panel. The reset panel contains the following talkback microphone circuitry:

- Talkback microphone pre-amplifier
- Internal preset resistor to adjust the gain from 18dB to 48dB
- Internal switch to enable the 16V phantom power to the talkback microphone (SW9)
- Talkback microphone ADC
- Internal switch to set the talkback output signal format to AES or analogue (SW5)

Headphone Connections

On consoles with a screen section the headphone jack is located in the well next to the screen. On single section consoles the headphone jack is located on the interface plate next to the console backplane. The headphone output is driven by circuitry on the reset panel. The reset panel contains the following headphone circuitry:

- Headphone DAC
- Headphone amplifier
- An internal DIL switch to reverse the phase of the right leg of headphone audio (SW4)

Installations that do not use an external talkback system can obtain the headphone signal from an AES output via an XLR, BNC or EDAC digital interface panel. The talkback signal will feed an analogue or AES input via the appropriate XLR, BNC or EDAC interface panel depending on the format selected using the DIL switch inside the reset panel (SW5).

Connecting External Equipment

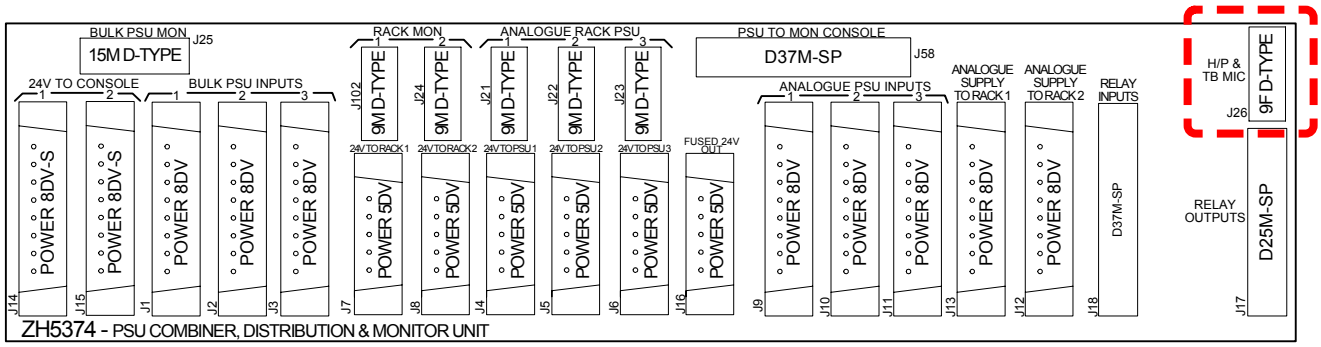
If the talkback output is required to feed an external talkback system, the desk talkback output will feed the external talkback system via a cable from the power monitoring and distribution unit, or via an extra cable wired into the 37-way D-type on the console backplane, depending on which is nearer.

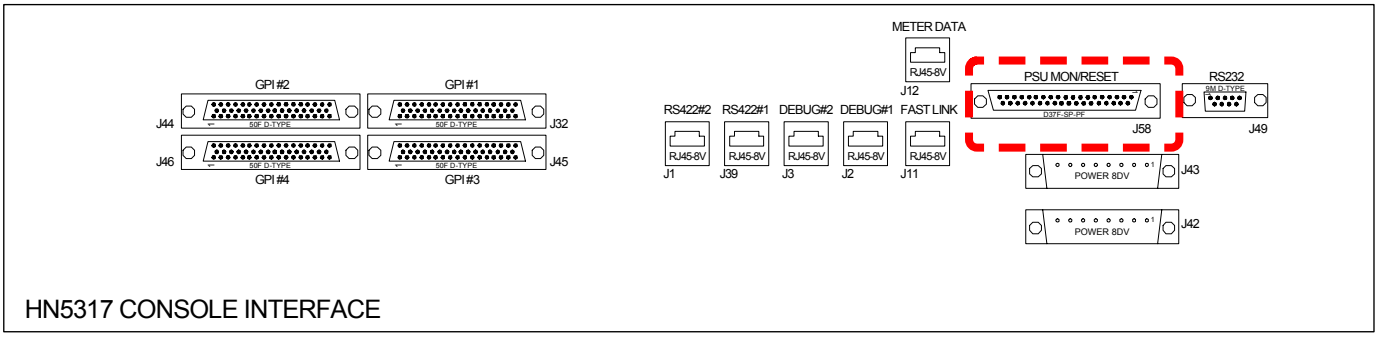
If the headphone feed is to come from external equipment, the connection will either be via a cable to the D-type connector J26 on the power monitoring and distribution unit, or via an extra cable wired into the 37-way D-type connector J58 on the rear of the console depending on which is nearer. Please note that this can be an AES signal only.

Connector J26 Pin Out Information

On the rear of the PSU monitoring and distribution unit, connector J26:-

Pins 1 and 2 - From control surface TB mic (AES or analogue)
Pins 4 and 5 - To control surface headphone jack (AES only).





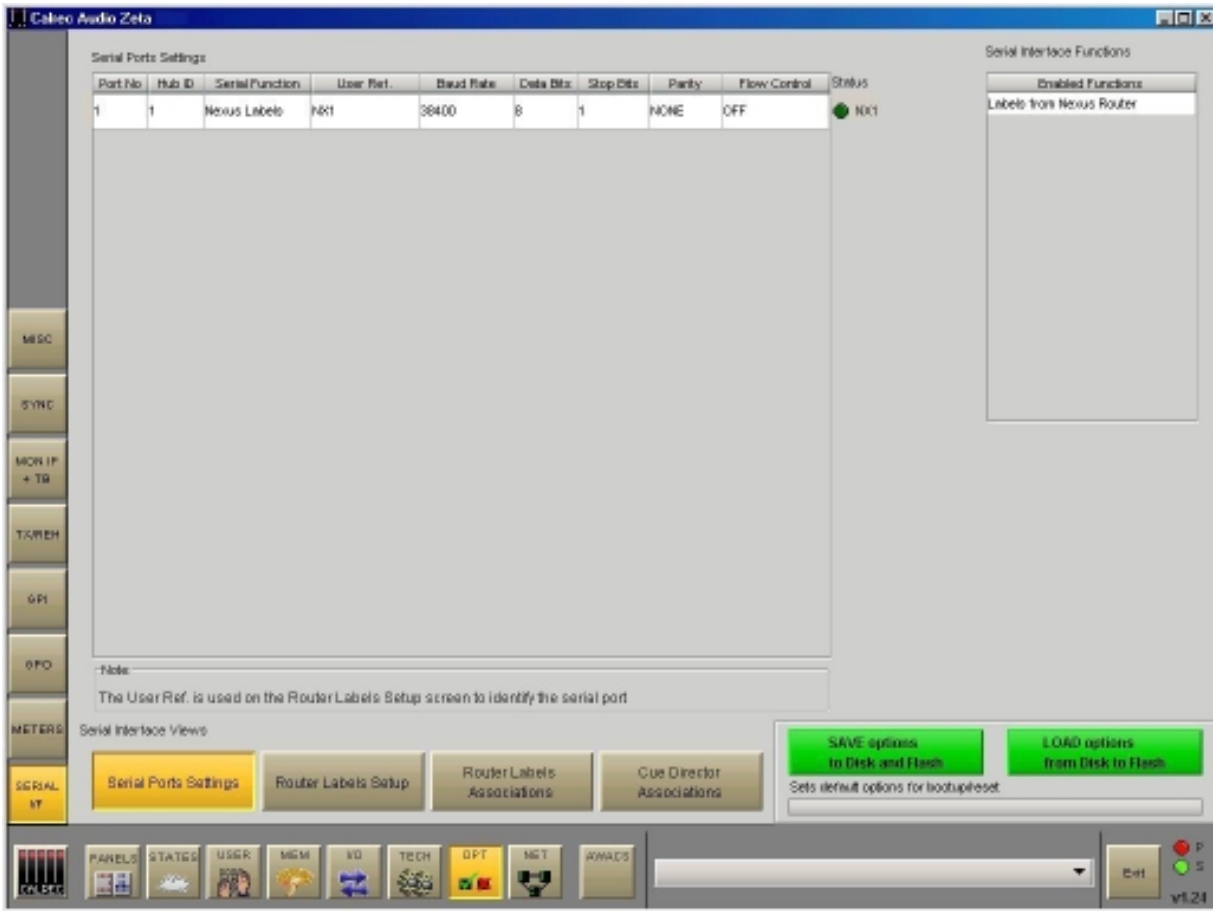
SERIAL INTERFACE

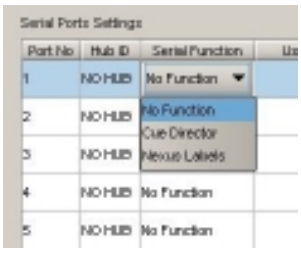
The system currently supports the following serial interfaces:

- 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 console has a serial interface port for allowing equipment to be connected to the system. The Serial Port Settings screen is used to tell the system what information it should receive from the serial interface port, by allocating a function to it from a drop down box in the Serial Function column. Only the serial functions which are enabled for the console will be available for selection.

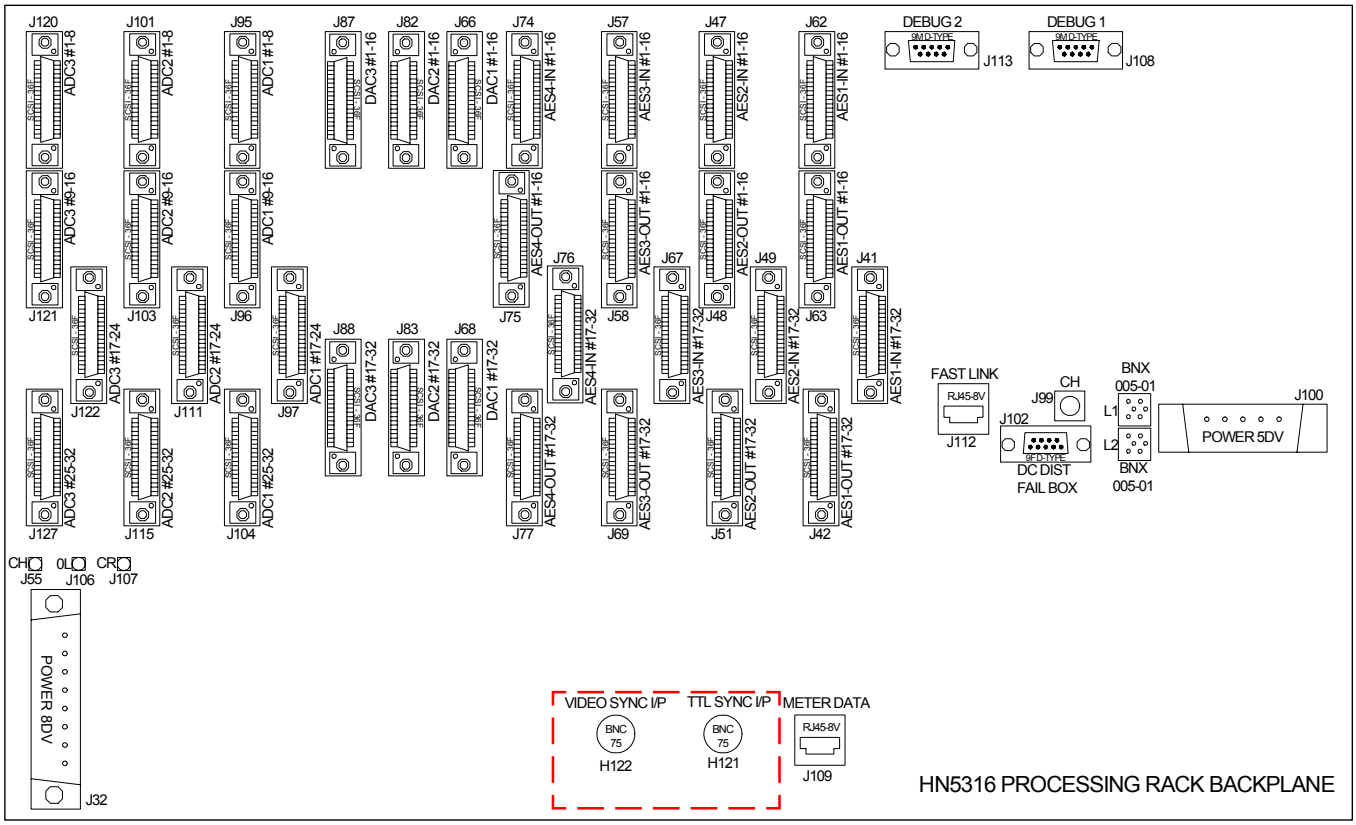
The function can be given a name by typing up to six characters in the USER REF column.

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

SYNCHRONISATION

The system can be pre-set with up to five external sync sources, plus internal, such that if the first source fails, it will automatically switch to the second, 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 Processing 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). If this is the case, other digital equipment should be synchronised to the digital outputs of the console. It is strongly recommended that all items of digital equipment connected digitally to the console are synchronised to the same sync signal.

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.

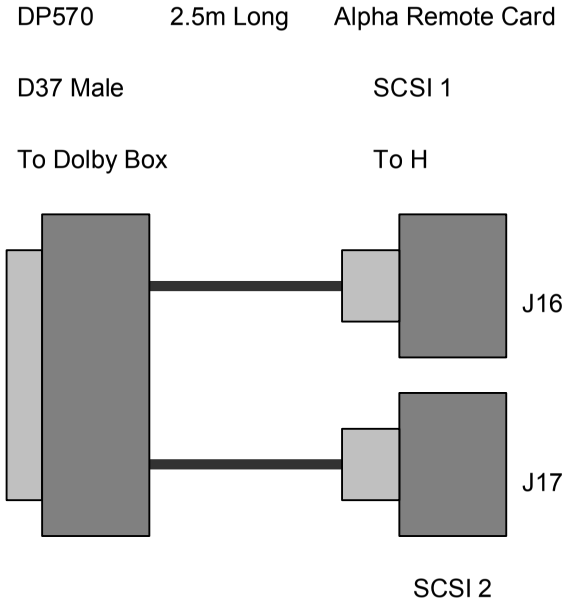
Dolby Multichannel Audio Tool Model DP570 to Alpha Remote Connection Cable (fully isolated)

Designed to be plugged in second remote card

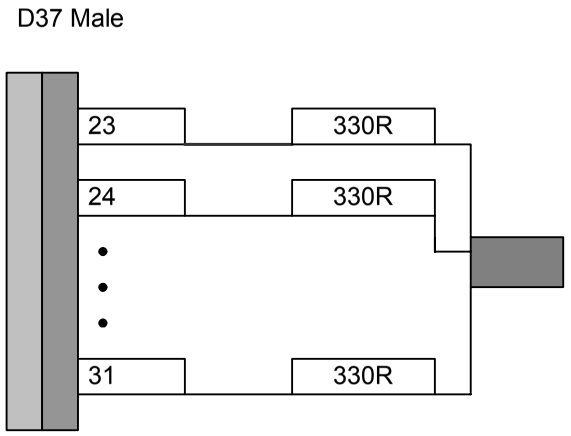
Dolby DP570 GPIO connector D37 Male	
pin	function
1	5V
2	Fault Output
3	Error_Output
4	User defined output
5	Solo tally output
6	Solo control input
7	Surround
8	Stereo
9	Mono
10	Phantom Centre
11	3Stereo
12	Prologic
13	Line
14	Custom
15	RF
16	
17	
18	
19	
20	
21	
22	
23	Surround
24	Stereo
25	Mono
26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

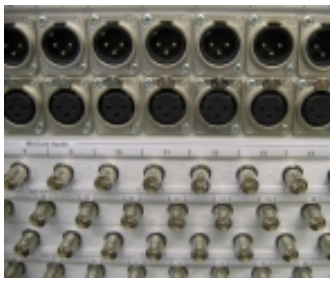


Each Relay common needs a 330R resistor in series



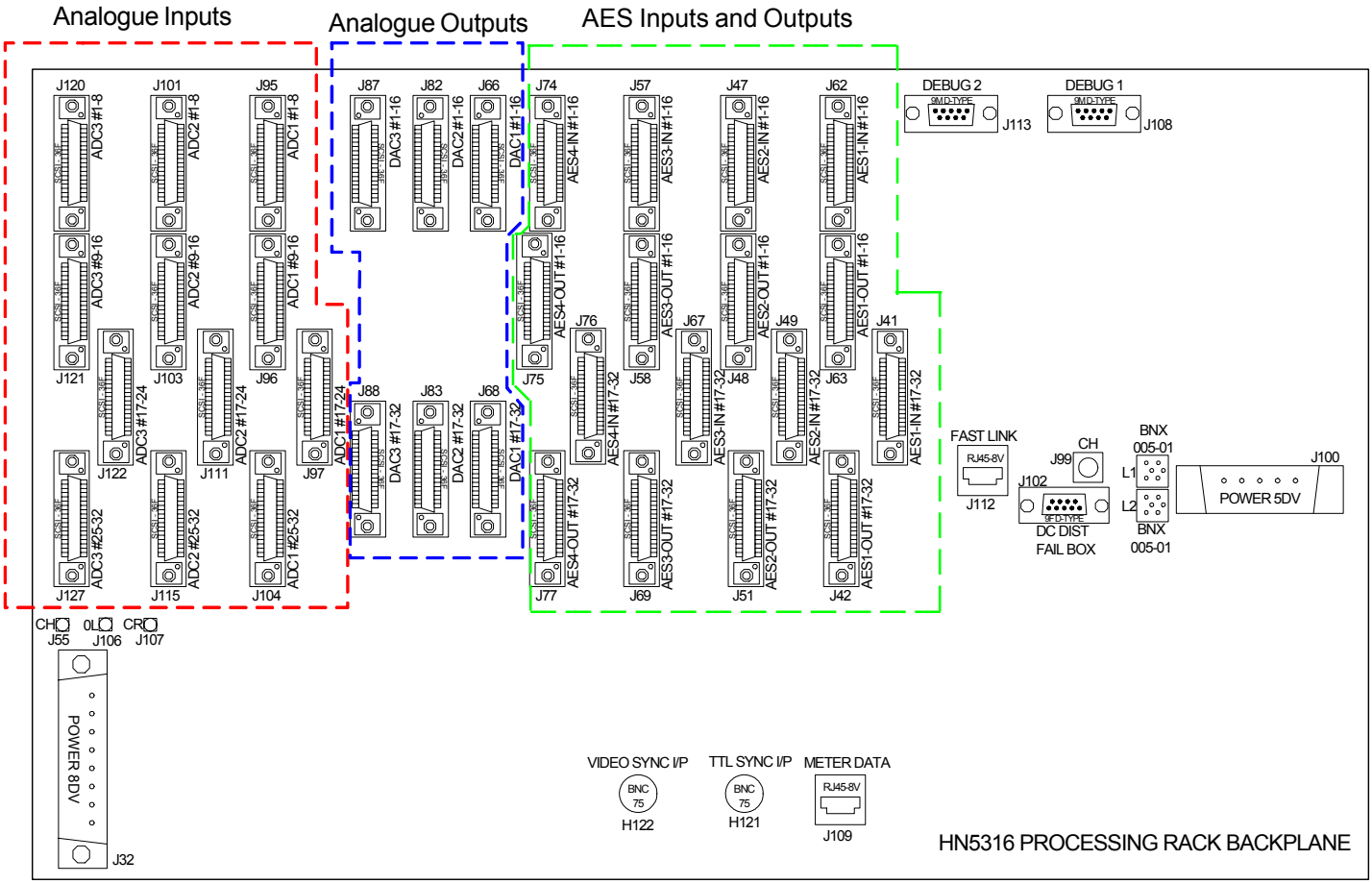
Cable schedule for Dolby DP570 & DP564 remote connection to Calrec Alpha 100													0681-87
Cable No	Cable	Cable	Length	Colours	From				To				Circuit
	Description	Type			Pins	Conn Type	Area	Con. No.	Area	Con. No.	Conn Type	Pins	
1	Alpha Rem1	BEL10 9510	8m	Bk of (Bk/R)	1*	D37MC	Eqpt Bay	GPIO	HN4916-2	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

Audio Input and Output Interface Options



AUDIO INPUTS AND OUTPUTS

All of the system's inputs and outputs are provided on 36 way female SCSI-style connectors on the rear of the Processing Rack.



AES Inputs and Outputs

The Processing Rack can house up to 4 AES I/O cards, each of which provides 32 AES inputs and 32 AES outputs. The cards are inserted into the slots within the rack, these are numbered 1-4. 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. Each of the connectors provides 16 AES pairs.

Of the 4 slots available, up to 3 can be occupied by wide area bulk I/O (WAB) cards, which are used to interface to MADI units or a Hydra audio networking 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 Processing Rack belonging to that slot are used to connect to the equipment being interfaced.

AES SLOT	AES INPUTS 1-16 CONNECTOR	AES INPUTS 17-32 CONNECTOR	AES OUTPUTS 1-16 CONNECTOR	AES OUTPUTS 17-32 CONNECTOR
1	J62	J41	J63	J42
2	J47	J49	J48	J51
3	J57	J67	J58	J69
4	J74	J76	J75	J77

Analogue Inputs (ADC Cards)

The Processing Rack can house up to 3 mic/line input (ADC) cards, each of which provides 16 stereo inputs. The cards are inserted into the slots within the rack, these are numbered 1-3. Each slot has 4 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	MIC/LINE INPUTS 17-24 CONNECTOR	MIC/LINE INPUTS 25-32 CONNECTOR
1	J95	J96	J97	J104
2	J101	J103	J111	J115
3	J120	J121	J122	J127

Analogue Outputs (DAC Cards)

In addition, the Processing Rack can house up to 3 line output (DAC) cards, each of which provides 16 stereo outputs. The cards are inserted into the slots within the rack, these are numbered 1-3. Each slot has 2 dedicated output connectors 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.

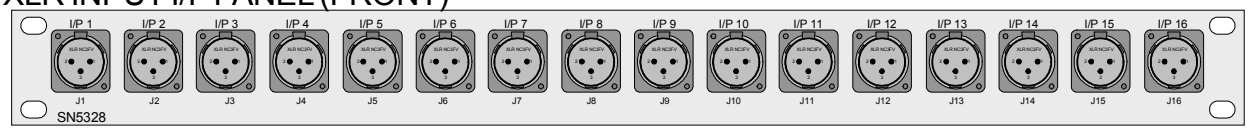
DAC SLOT	LINE OUTPUTS 1-16 CONNECTOR	LINE OUTPUTS 17-32 CONNECTOR
1	J66	J68
2	J82	J83
3	J87	J88

INTERFACE CONNECTOR PANELS

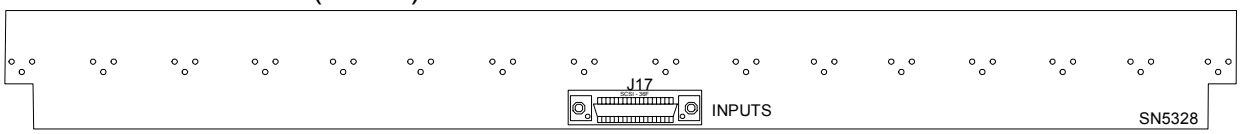
It is possible to interface directly to the console using 36 way SCSI mating connectors. Optionally, break out connector panels and cabling can be provided. Please note that interface panels must be fitted within 3m (9.8ft) of the backplane they connect to.

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

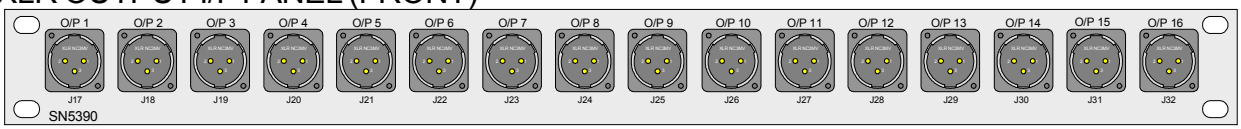
XLR INPUT I/F PANEL (FRONT)



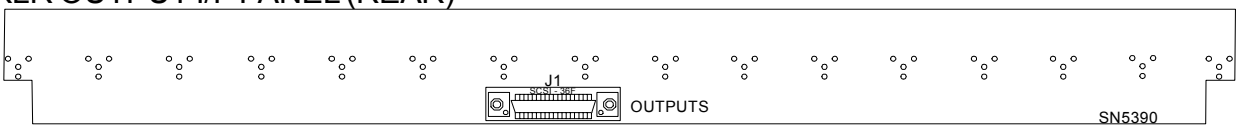
XLR INPUT I/F PANEL (REAR)



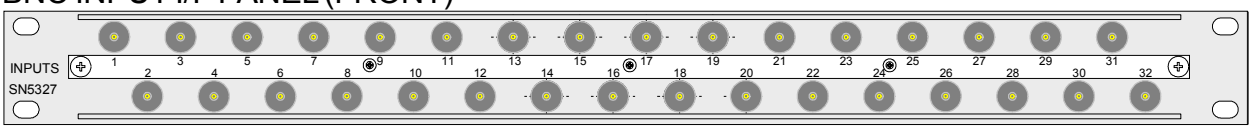
XLR OUTPUT I/F PANEL (FRONT)



XLR OUTPUT I/F PANEL (REAR)

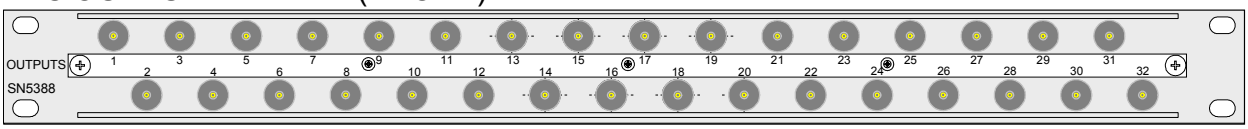


BNC INPUT I/F PANEL (FRONT)

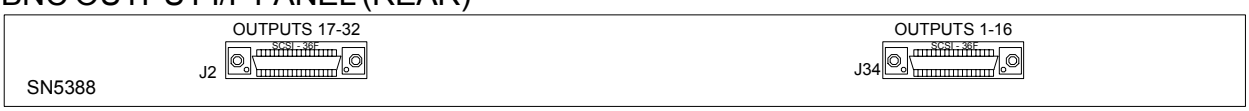


BNC INPUT I/F PANEL (REAR)

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:

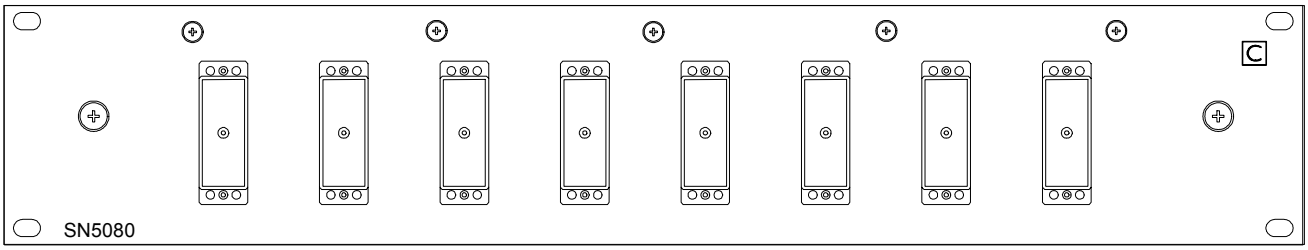
Interface	Style 1	Style 2
Mic/Line or Line Inputs	4 pairs per EDAC	6 pairs per EDAC
Line Only Inputs	8 pairs per EDAC	6 pairs per EDAC
Line Outputs	8 pairs per EDAC	6 pairs per EDAC

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

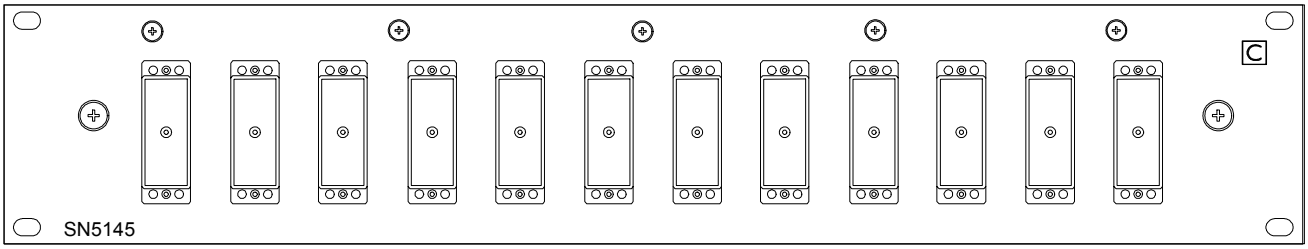
- The number of connections available in the external cabling
- Restricted amount of interface space available within 1m(3.2ft) of the backplane.

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).

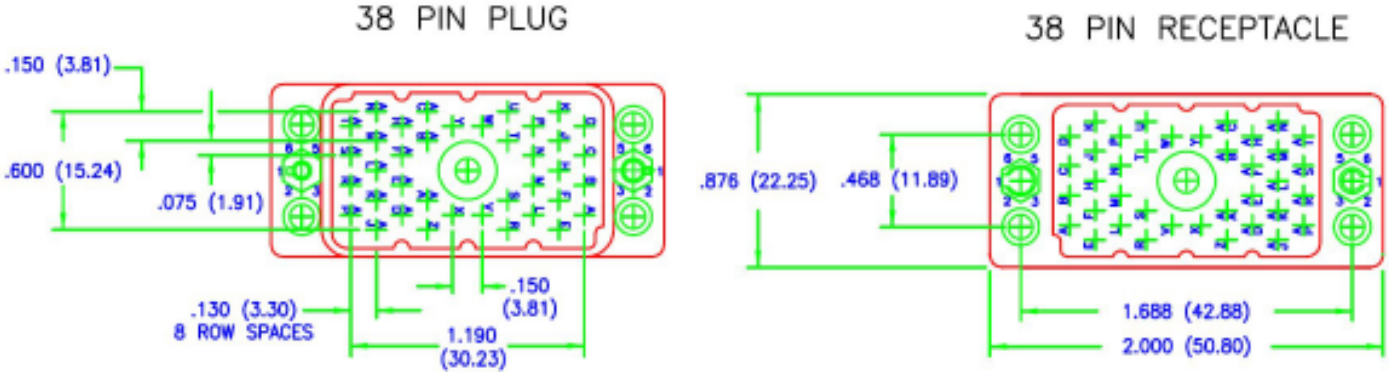
8X38W EDAC PANEL



12X38W EDAC PANEL

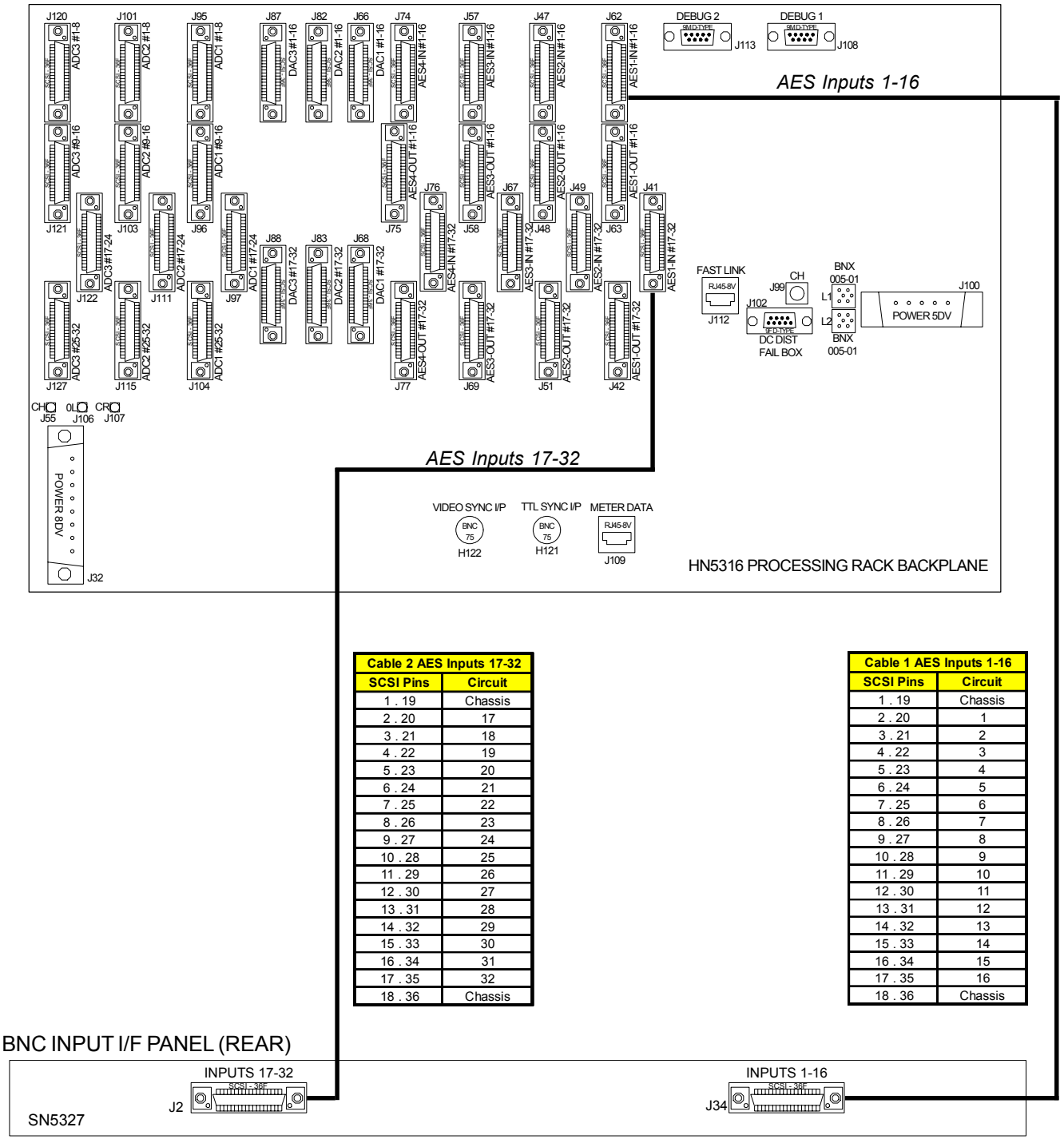


The connectors on these panels are 38 pin, male panel-mounted EDAC connectors (38MP-plug). Therefore, cables interfacing to these panels need 38 pin, female cabling connectors (38FC-receptacle).



AES INPUTS - BNC INTERFACE

Each AES I/O card in the Processing Rack provides 32 AES inputs and 32 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 are connected to 32 way BNC interface panels via SCSI-style cabling. For clarity, input connections from just 1 AES card (occupying AES slot 1) to an interface panel are shown here.



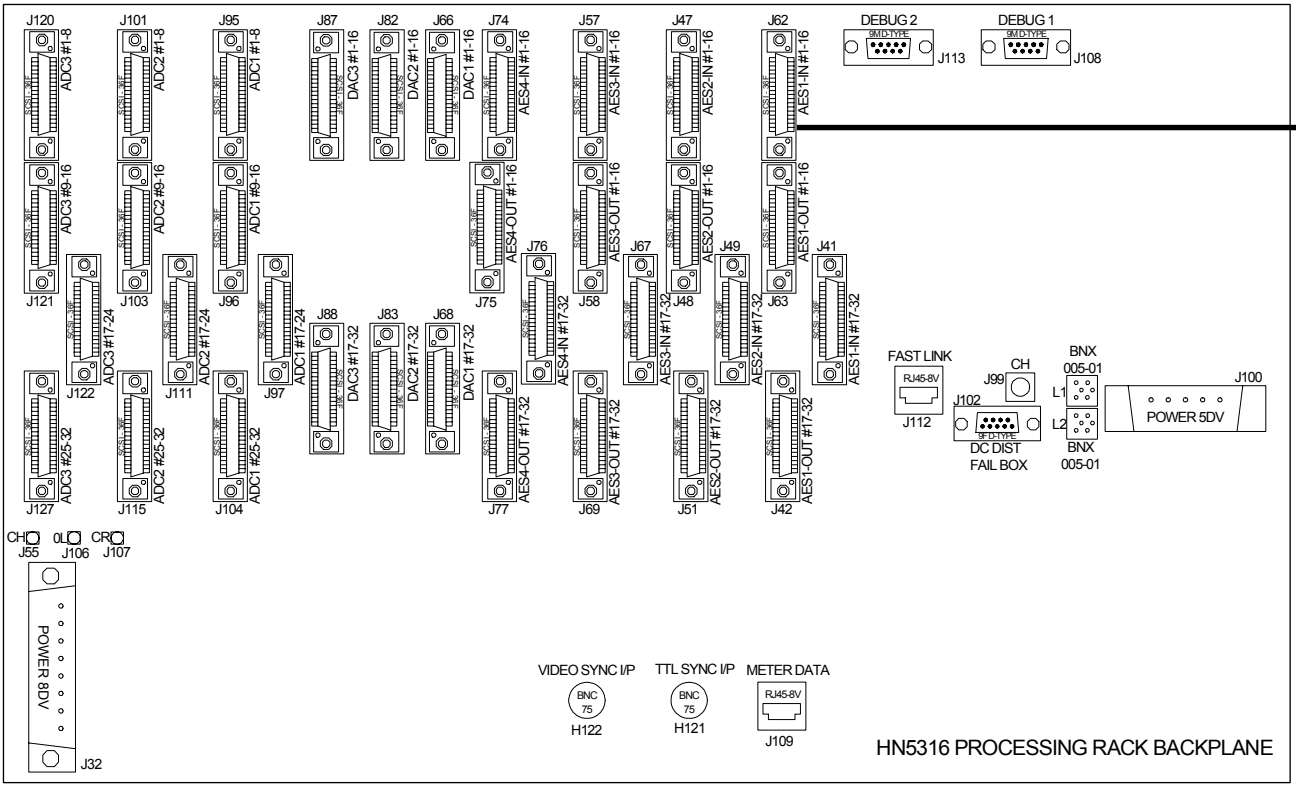
Cable 2 AES Inputs 17-32	
SCSI Pins	**Circuit**
1 . 19	Chassis
2 . 20	17
3 . 21	18
4 . 22	19
5 . 23	20
6 . 24	21
7 . 25	22
8 . 26	23
9 . 27	24
10 . 28	25
11 . 29	26
12 . 30	27
13 . 31	28
14 . 32	29
15 . 33	30
16 . 34	31
17 . 35	32
18 . 36	Chassis

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

The BNC interface panels must be located within 3m (9.8ft) of the Processing Rack. Each BNC interface panel can interface 32 AES inputs. Therefore if all AES inputs are used, 4 BNC interface panels would be needed. For clarity, connections from a BNC interface panel to the inputs on just 1 AES card are shown here.

AES INPUTS - XLR INTERFACE

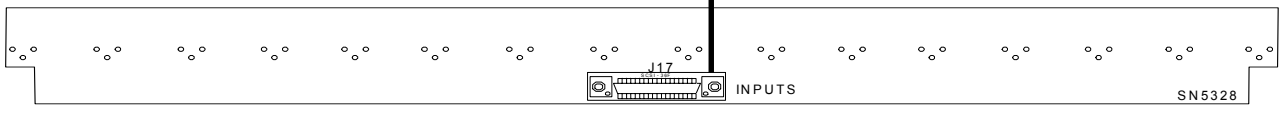
Each AES I/O card in the Processing Rack provides 32 AES inputs and 32 AES outputs. Each slot has dedicated input and output connectors on the rear of the rack, to which the system's AES inputs and outputs are connected. The diagram below shows how the AES input connectors are connected to 16 way XLR interface panels via SCSI-style cabling. For clarity, connections from the first 16 AES inputs on AES card 1 to an XLR interface panel are shown here.



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

On 3 pin XLR:
Pin 1 is Chassis Connections
Pin 2 is HOT (PHASE)
Pin 3 is COLD (ANTI-PHASE)

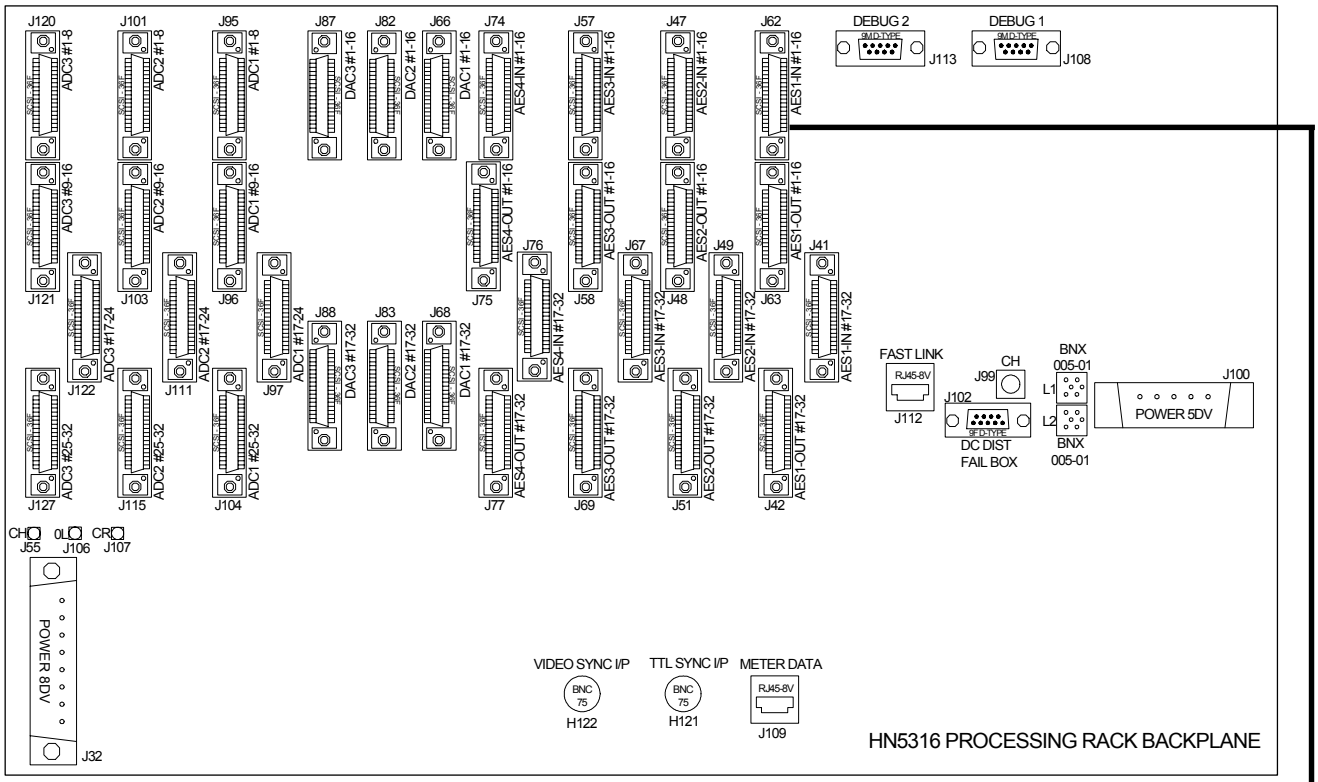
XLR INPUT I/F PANEL (REAR)



The XLR interface panels must be located within 3m (9.8ft) of the rack. Each XLR interface panel can interface 16 AES inputs. Therefore if all AES inputs are used, 8 XLR interface panels would be needed.

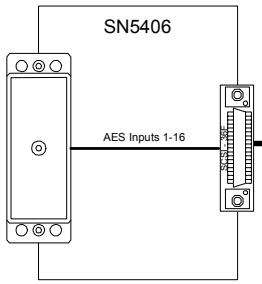
AES INPUTS - EDAC INTERFACE

Each AES I/O card in the Processing Rack provides 32 AES inputs and 32 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 AES inputs are connected to an 8 way EDAC interface panel via SCSI-style cabling. For clarity, connections from the first 16 AES inputs on AES card 1 to an EDAC connector on the interface panel are shown here.



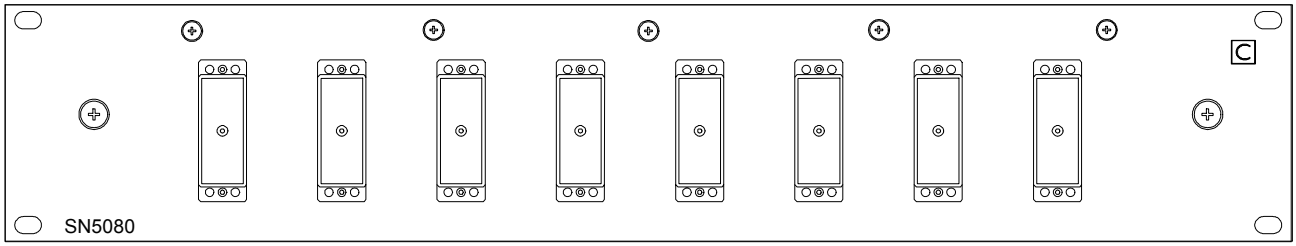
Via SN5406 SCSI to 38W EDAC converter card - Rear of Interface Panel

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



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

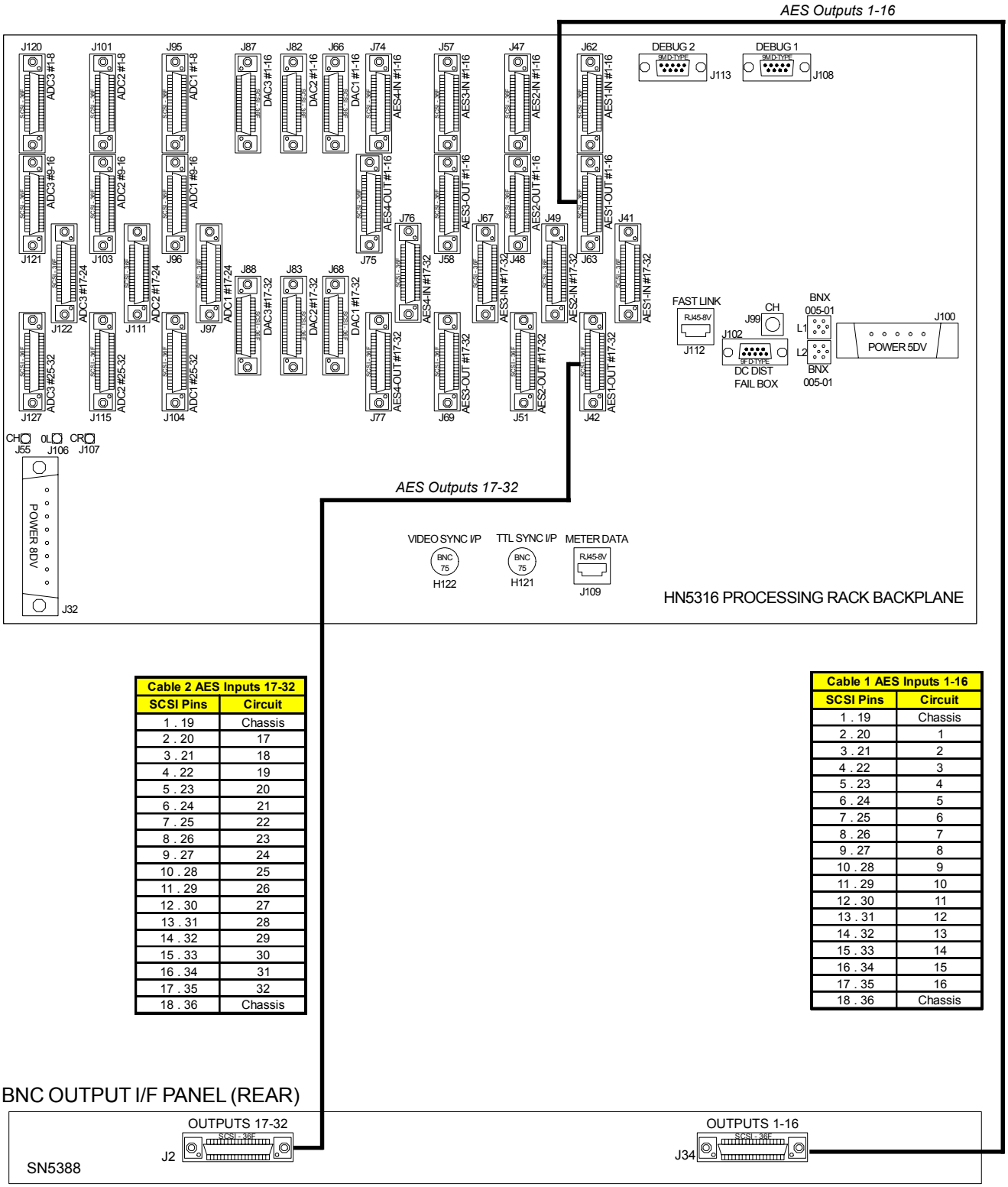
8 WAY EDAC INTERFACE PANEL



The EDAC Interface panels must be located within 3m (9.8ft) of the rack. Each connector on the panel can interface 16 AES inputs. Therefore if all AES inputs are used, all 8 connectors on the panel would be needed.

AES OUTPUTS - BNC INTERFACE

Each AES I/O card in the Processing Rack provides 32 AES inputs and 32 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 are connected to BNC interface panels via SCSI-style cabling. For clarity, connections from the outputs on just 1 AES card to an interface panel is shown here.



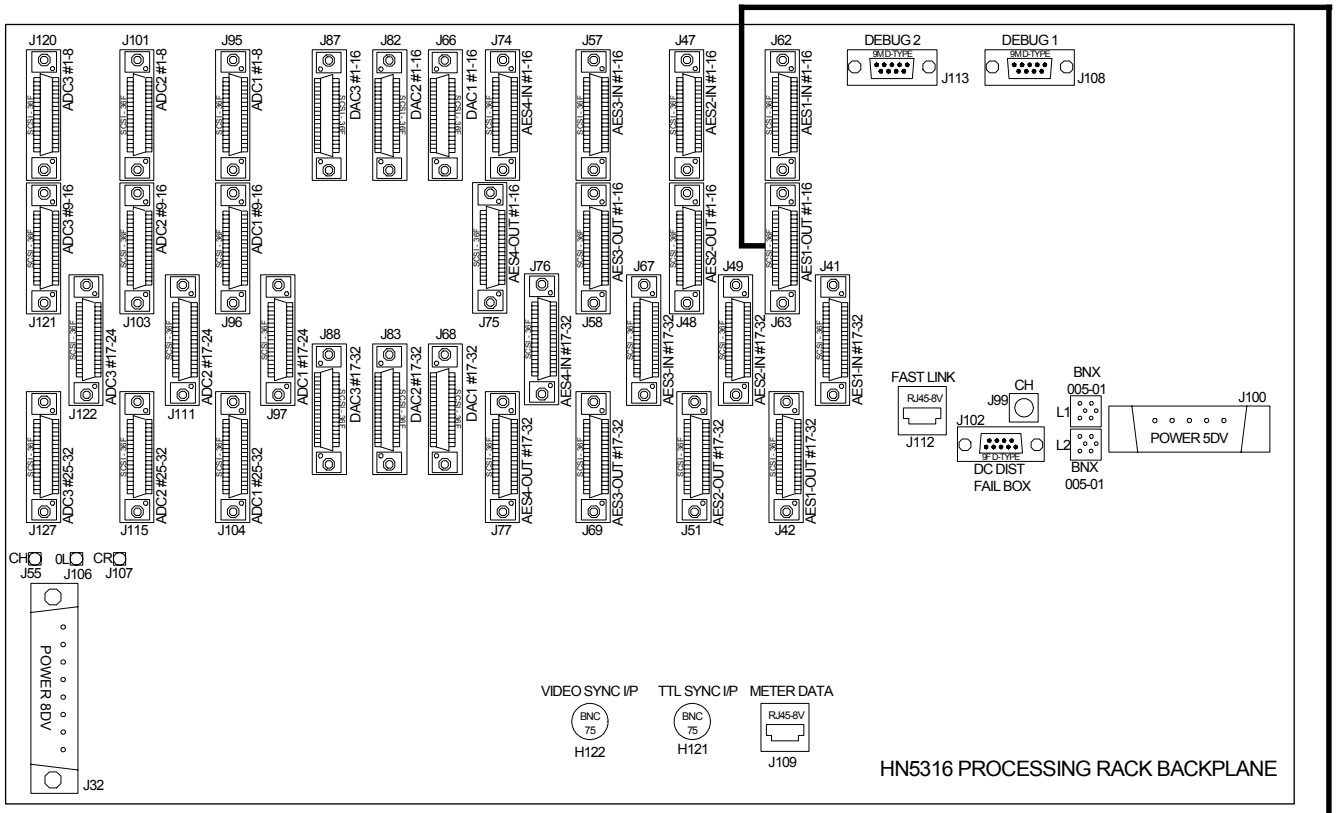
Cable 2 AES Inputs 17-32	
SCSI Pins	Circuit
1 . 19	Chassis
2 . 20	17
3 . 21	18
4 . 22	19
5 . 23	20
6 . 24	21
7 . 25	22
8 . 26	23
9 . 27	24
10 . 28	25
11 . 29	26
12 . 30	27
13 . 31	28
14 . 32	29
15 . 33	30
16 . 34	31
17 . 35	32
18 . 36	Chassis

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

The BNC interface panels must be located within 3m (9.8ft) of the Processing Rack. Each panel can interface 32 AES outputs. Therefore if all AES outputs are used, 4 panels would be needed.

AES OUTPUTS - XLR INTERFACE

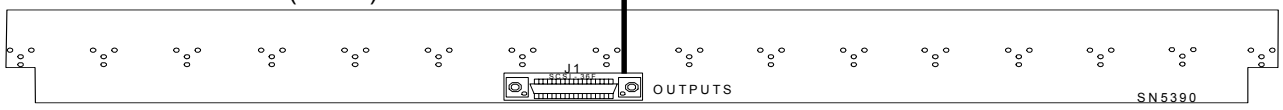
Each AES I/O card in the Processing Rack provides 32 AES inputs and 32 AES outputs. Each slot has dedicated input and output connectors on the rear of the rack, to which the system's AES inputs and outputs are connected. The diagram below shows how the AES output connectors are connected to XLR interface panels via SCSI-style cabling. For clarity, just the connections from the first 16 outputs on AES card 1 to an interface panel are shown here.



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

On 3 pin XLR:
Pin 1 is Chassis Connections
Pin 2 is HOT (PHASE)
Pin 3 is COLD (ANTI-PHASE)

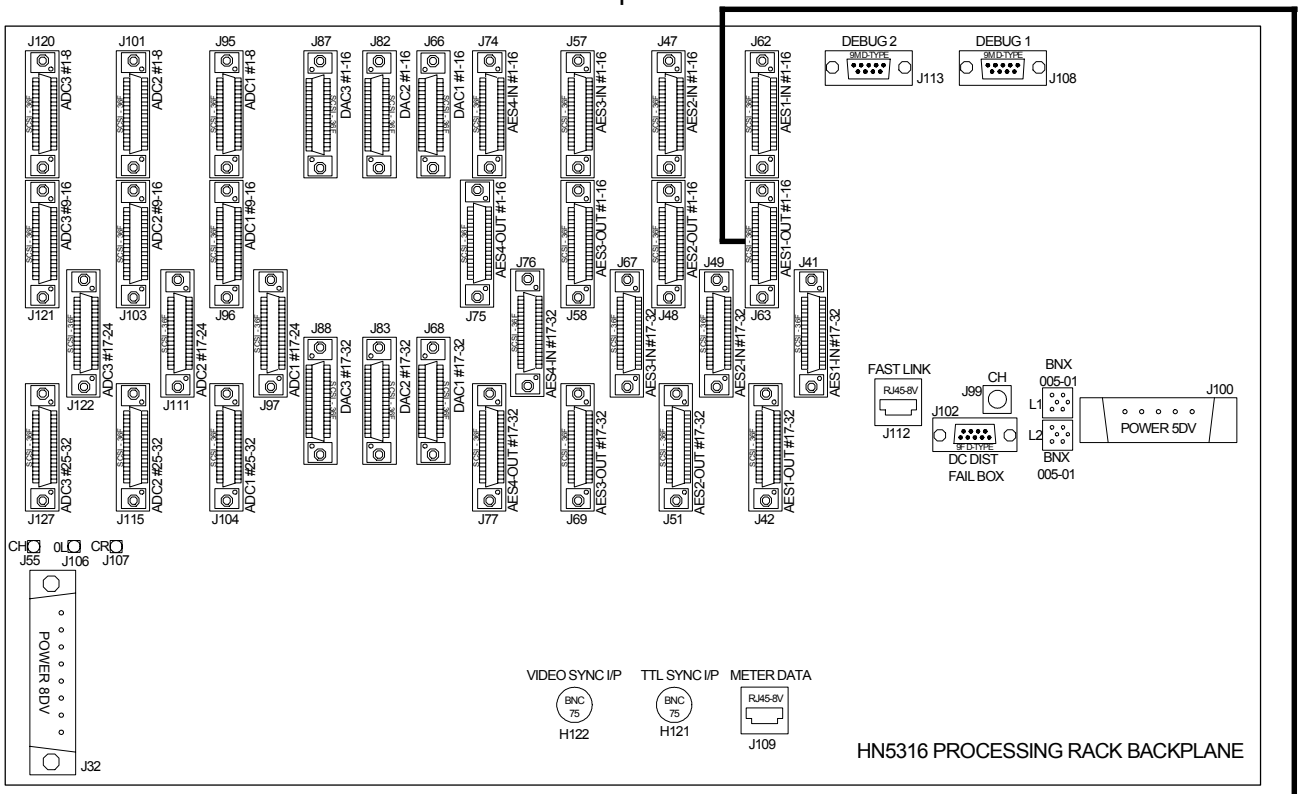
XLR OUTPUT I/F PANEL (REAR)



The XLR Interface panels must be located within 3m (9.8ft) of the rack. Each XLR interface panel can interface 16 AES outputs. Therefore if all AES outputs are used, 8 XLR interface panels would be needed.

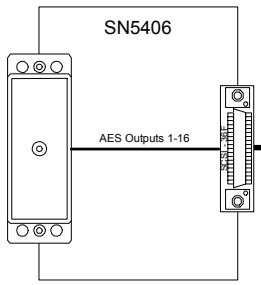
AES OUTPUTS - EDAC INTERFACE

Each AES I/O card in the Processing Rack provides 32 AES inputs and 32 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 are connected to XLR interface panels via SCSI-style cabling. For clarity, just the connections from the first 16 outputs on AES card 1 to an EDAC connector on the interface panel are shown here.



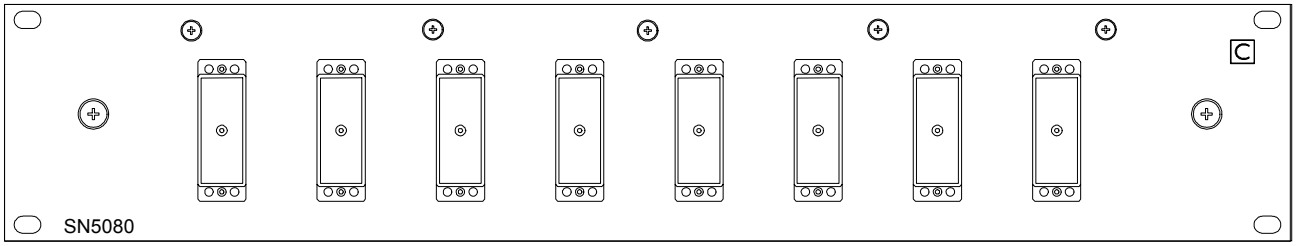
Via SN5406 SCSI to 38W EDAC converter card - Rear of Interface Panel

A.B	AES 1
C.D	AES 2
E.F	AES 3
J.K	AES 4
L.M	AES 5
N.P	AES 6
R.S	AES 7
T.U	AES 8
Z.AA	AES 9
BB.CC	AES 10
DD.EE	AES 11
FF.HH	AES 12
JJ.KK	AES 13
MM.NN	AES 14
PP.RR	AES 15
SS.TT	AES 16
H.LL	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

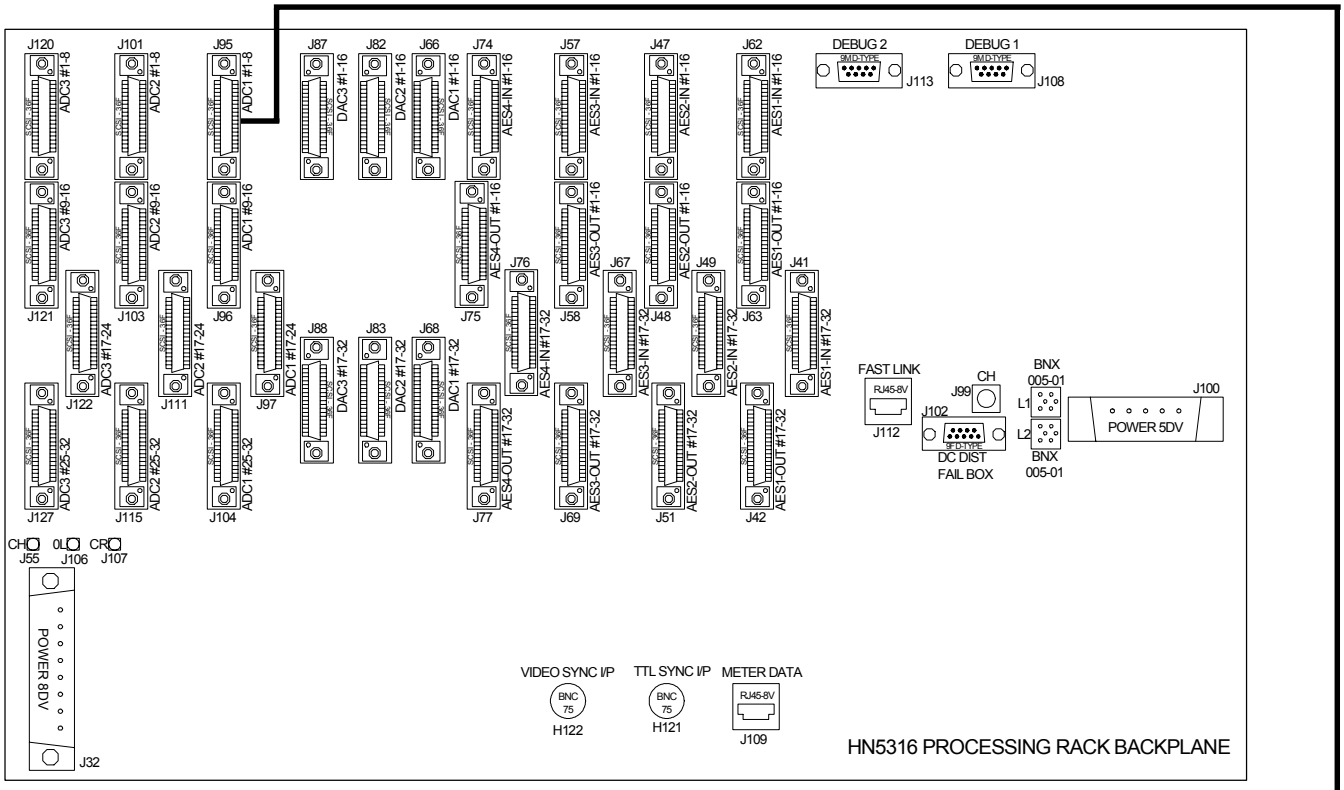
8 WAY EDAC INTERFACE PANEL



The EDAC interface panels must be located within 3m (9.8ft) of the rack. Each EDAC connector on the panel can interface 16 AES outputs. Therefore if all AES outputs are used, all 8 connectors on the panel would be needed.

ANALOGUE MIC/LINE INPUTS - STYLE 1

Up to 3 analogue input (ADC) cards can be fitted into the Processing Rack, each providing 16 stereo inputs. The cards are inserted into the slots within the rack, and each slot has 4 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. The diagram below shows how 8 or 12 way EDAC Input Interface panels can be connected to the ADC connectors on the rear of the rack via Calrec custom cabling to achieve Style 1 (4 pairs per EDAC).



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 Inputs 1-4

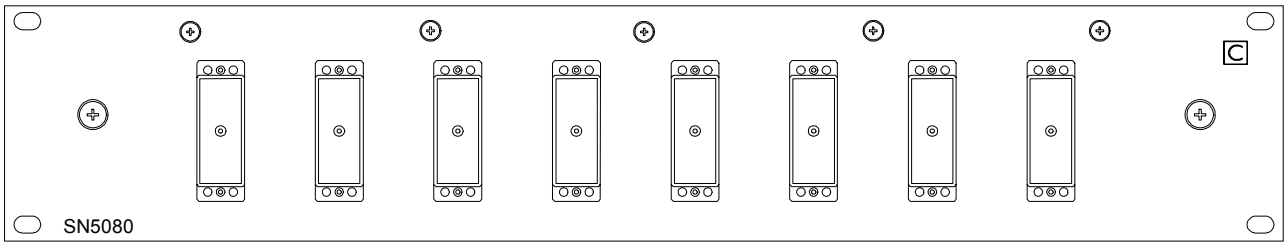
On EDACs, pin 1 (A) is HOT (phase), pin 2 (E) is COLD (anti-phase) and pin 3 (B) is chassis connections.

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

4 Cables for each ADC card fitted - 4 stereo inputs on each cable (Just one shown here).

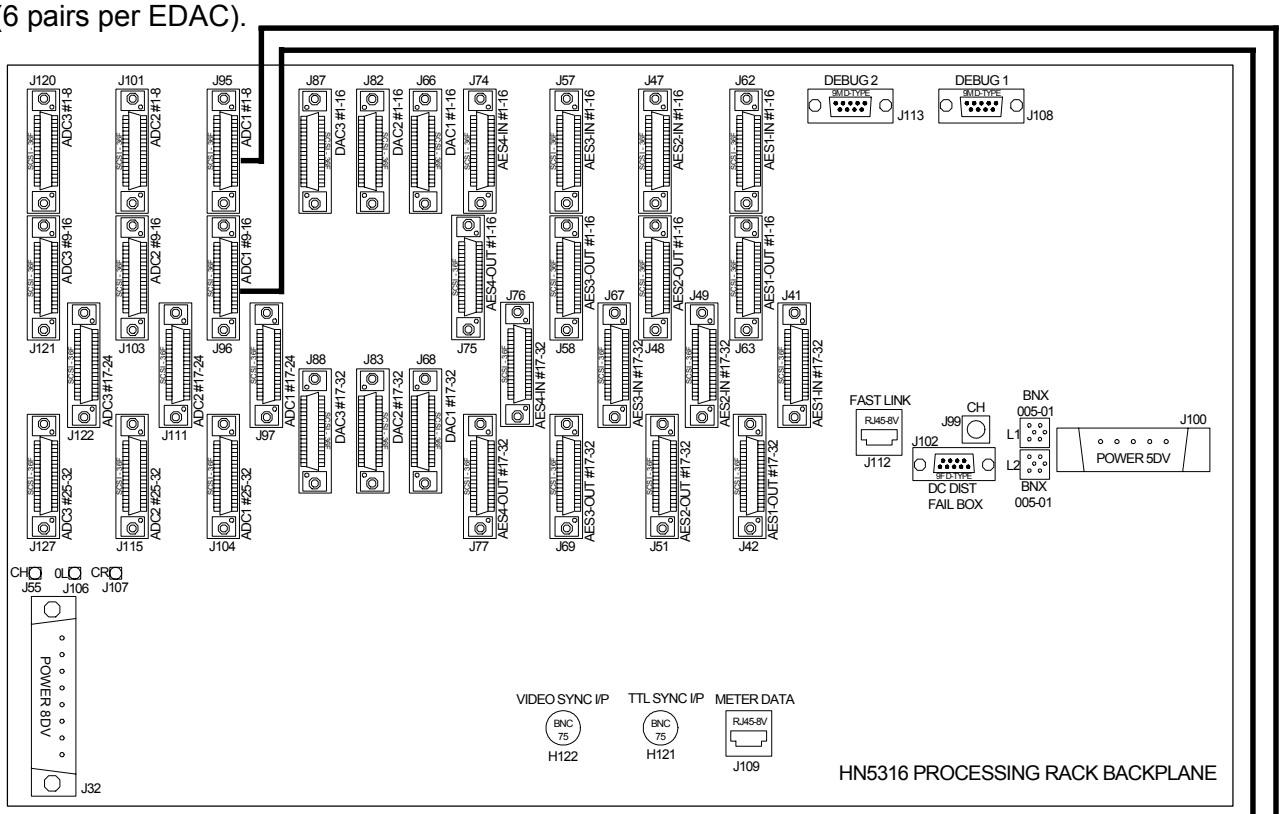
8 WAY EDAC INTERFACE PANEL



Ideally the EDAC interface panels should be located within 3m (9.8ft) of the Rack.

ANALOGUE MIC/LINE INPUTS - STYLE 2

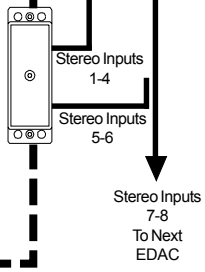
Up to 3 analogue input (ADC) cards can be fitted into the Processing Rack, each providing 16 stereo inputs. The cards are inserted into the slots within the rack, and each slot has 4 dedicated input connectors on the rear of the rack, to which the system's analogue inputs are connected. Each of the input connectors provides connections for 4 stereo inputs. The diagram below shows how 8 or 12 way EDAC Input Interface panels are connected to the ADC connectors on the rear of the rack via Calrec custom cabling to achieve Style 2 (6 pairs per EDAC).



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



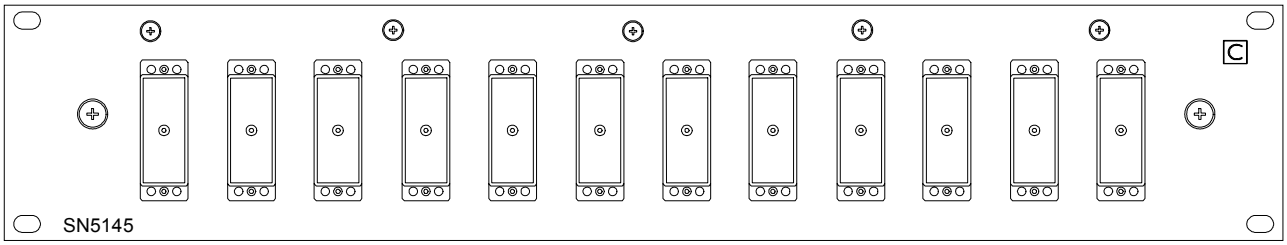
Cable 1 Stereo Inputs 1-4	
SCSI Pins	Circuit
1 . 19	Chassis
2 . 20	1L
3 . 21	Chassis
4 . 22	1R
5 . 23	Chassis
6 . 24	2L
7 . 25	Chassis
8 . 26	2R
9 . 27	Chassis
10 . 28	Chassis
11 . 29	3L
12 . 30	Chassis
13 . 31	3R
14 . 32	Chassis
15 . 33	4L
16 . 34	Chassis
17 . 35	4R
18 . 36	Chassis

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

4 Cables are required for each ADC card fitted. Cable 2 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.

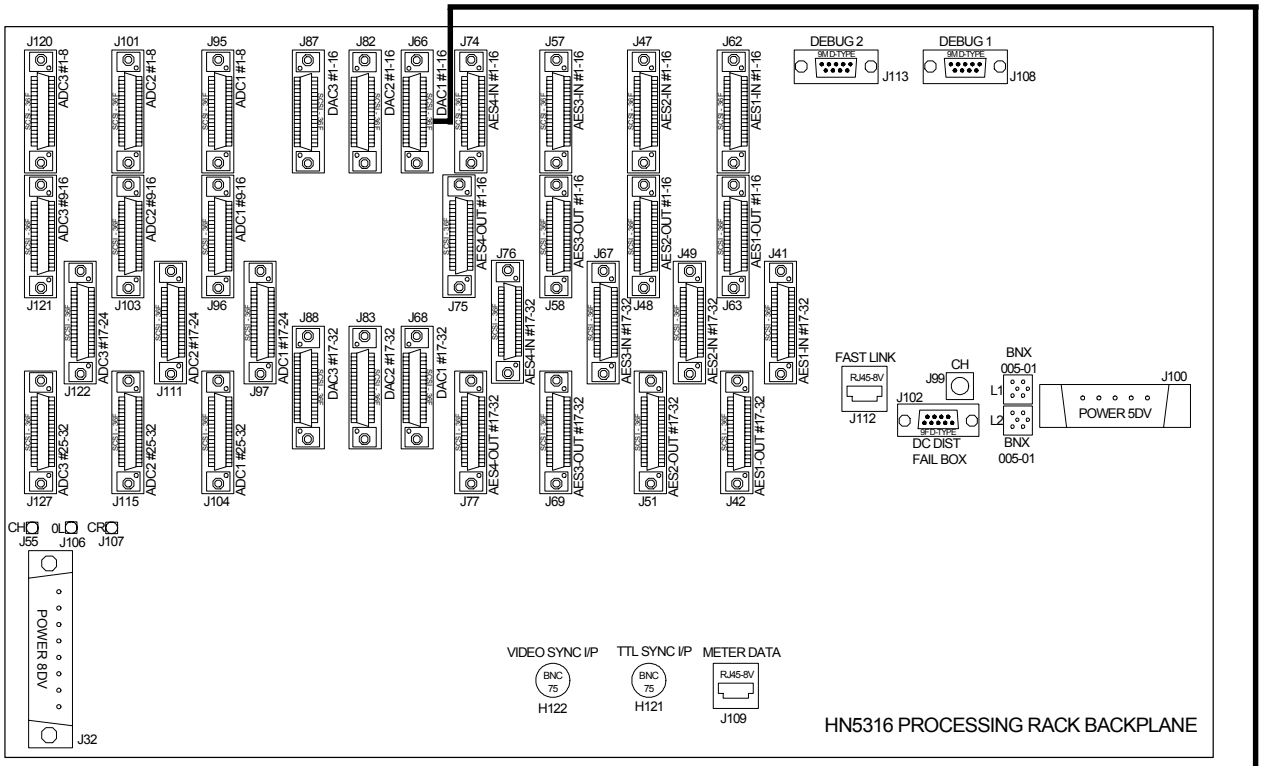
12 WAY EDAC INTERFACE PANEL



Ideally the EDAC interface panels should be located within 3m (9.8ft) of the Rack.

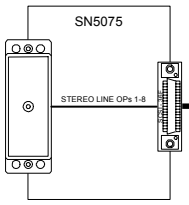
ANALOGUE LINE OUTPUTS - STYLE 1

Each analogue output (DAC) card in the Processing Rack, provides 16 stereo outputs. The cards are inserted into the slots within the rack, these are numbered 1-3. Each slot has 2 dedicated output connectors 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 8 way EDAC interface panels are connected to the DAC connectors on the rear of the rack via SCSI style cabling to achieve Style 1 (8 pairs per EDAC connector).



Via SN5075 SCSI to 38W EDAC converter card - Rear of Interface Panel

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



Stereo O/Ps 1-8

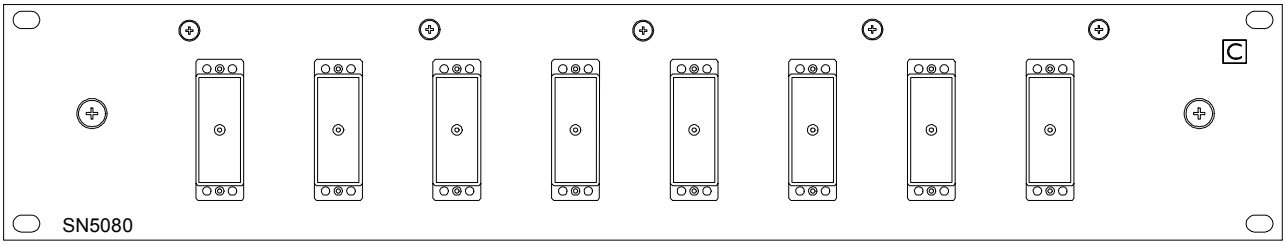
Style 1 - 8 pairs per 38 way EDAC

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

2 Cables 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.

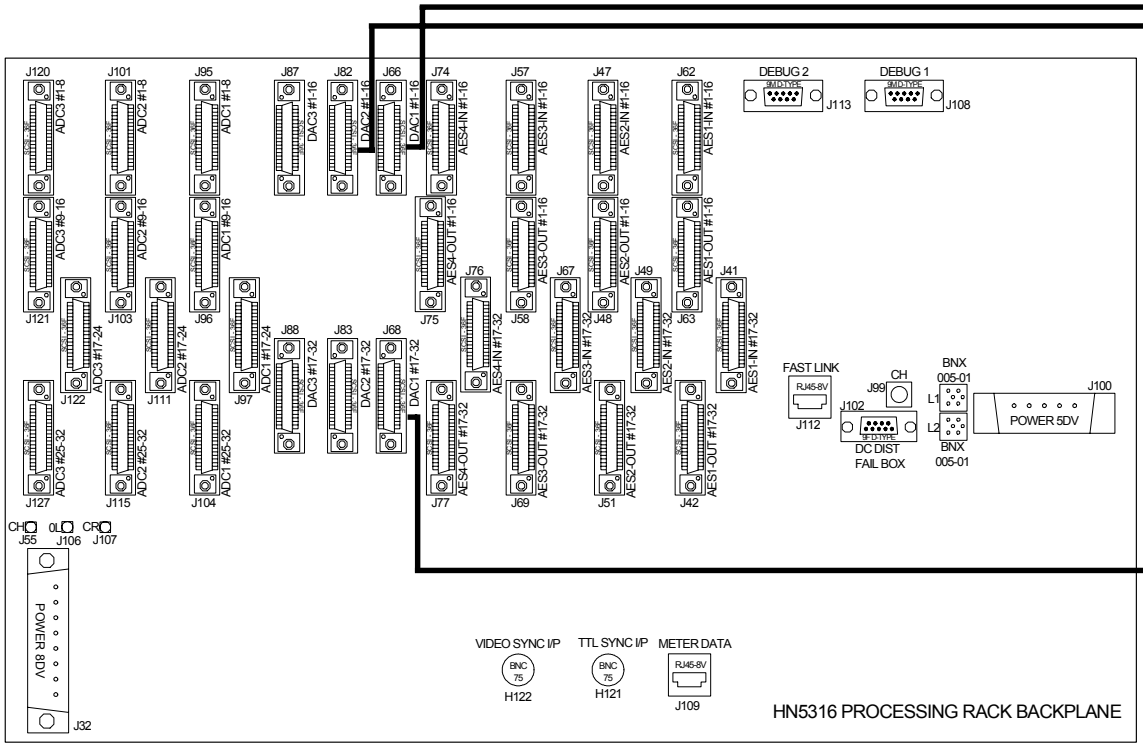
8 WAY EDAC INTERFACE PANEL

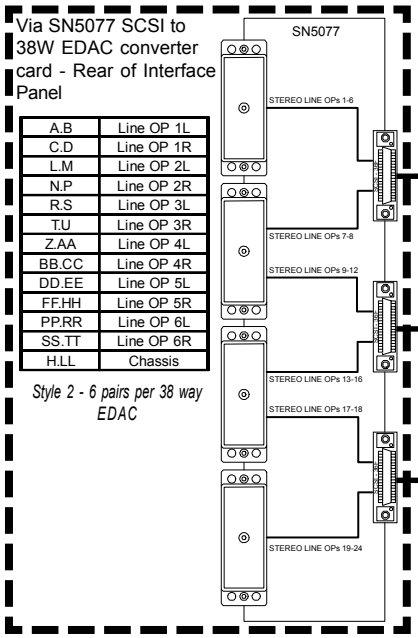


Ideally the EDAC interface panels should be located within 3m (9.8ft) of the Rack.

ANALOGUE LINE OUTPUTS - STYLE 2

Up to 3 analogue output (DAC) cards can be fitted into the Processing Rack, each providing 16 stereo outputs. The cards are inserted into the slots within the rack, these are numbered 1-3. Each slot has 2 dedicated output connectors 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 8 way EDAC interface panels are connected to the DAC connectors on the rear of the rack via SCSI style cabling to achieve Style 2 (6 pairs per EDAC connector).





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

Stereo Outputs 1-8

Stereo Outputs 9-16

Stereo Outputs 17-24

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

2 Cables 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.

Ideally the EDAC interface panels should be located within 3m (9.8ft) of the 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. The only rules imposed on this are:

- The I/O must be labelled in pairs.
- The label must be no more than six characters.
- No two inputs can have the same label, 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, a stereo signal, or parts of a surround signal.

One exception to these rules is allowed:

When I/O is dedicated to mono signals only, (e.g phone lines, mono reverbs, mono distribution feeds) it 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 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, I/O 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.

Lists

In addition to labelling, each port can be allocated to one of a number of lists. This allows I/O which is wired for similar purposes to be grouped together for selection. Each list is automatically sorted alphabetically/numerically.

There are 12 separate lists for inputs and 8 for outputs. Each list can contain a mixture of normal I/O (labelled in pairs) and I/O dedicated to mono signals.

Each list will have been given a six character “list label” and the lists will have been sorted into the order in which they appear on the selection screens. The lists will appear in the same order on the I/O matrix panel. It is possible to determine which lists appear for selection on the I/O Matrix panel. This reduces the number of times the pot needs to be pushed, to go through all the available lists.

INPUT/OUTPUT LABELLING SHEETS

AES Inputs

AES Card 1 Inputs 1-32

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)
J62	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		
J41	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		

AES Card 2 Inputs 1-32

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)
J47	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		
J49	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

AES Card 3 Inputs 1-32

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)
J57	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		
J67	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		

AES Card 4 Inputs 1-32

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)
J74	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		
J76	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

AES Card 1 Outputs 1-32

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)
J63	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		
J42	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		

AES Card 2 Outputs 1-32

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)
J48	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		
J51	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

AES Card 3 Outputs 1-32

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)
J58	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		
J69	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		

AES Card 4 Outputs 1-32

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)
J75	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		
J77	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

Analogue Inputs

ADC Card 1 Inputs 1-32

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)
J95	1L + 1R							L R		
	2L + 2R							L R		
	3L + 3R							L R		
	4L + 4R							L R		
J96	5L + 5R							L R		
	6L + 6R							L R		
	7L + 7R							L R		
	8L + 8R							L R		
J97	9L + 9R							L R		
	10L + 10R							L R		
	11L + 11R							L R		
	12L + 12R							L R		
J104	13L + 13R							L R		
	14L + 14R							L R		
	15L + 15R							L R		
	16L + 16R							L R		

ADC Card 2 Inputs 1-32

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)
J101	1L + 1R							L R		
	2L + 2R							L R		
	3L + 3R							L R		
	4L + 4R							L R		
J103	5L + 5R							L R		
	6L + 6R							L R		
	7L + 7R							L R		
	8L + 8R							L R		
J111	9L + 9R							L R		
	10L + 10R							L R		
	11L + 11R							L R		
	12L + 12R							L R		
J115	13L + 13R							L R		
	14L + 14R							L R		
	15L + 15R							L R		
	16L + 16R							L R		

INPUT/OUTPUT LABELLING SHEETS

Analogue Inputs

ADC Card 3 Inputs 1-32

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)
J95	1L + 1R							L R		
	2L + 2R							L R		
	3L + 3R							L R		
	4L + 4R							L R		
J96	5L + 5R							L R		
	6L + 6R							L R		
	7L + 7R							L R		
	8L + 8R							L R		
J97	9L + 9R							L R		
	10L + 10R							L R		
	11L + 11R							L R		
	12L + 12R							L R		
J104	13L + 13R							L R		
	14L + 14R							L R		
	15L + 15R							L R		
	16L + 16R							L R		

INPUT/OUTPUT LABELLING SHEETS

Analogue Outputs

DAC Card 1 Outputs 1-32

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)
J66	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		
J68	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		

DAC Card 2 Outputs 1-32

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)
J82	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		
J83	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

Analogue Outputs

DAC Card 3 Outputs 1-32

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)
J87	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		
J88	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		

NOTES

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