

# Libra Live

## Installation Manual

527-237  
Issue 14

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## INSTALLING LIBRA LIVE

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### Important note for customer attention - this could affect your warranty:

It is important that you refer to this document. Information is provided concerning the installation procedure from unpacking and assembling to powering up the system ready for use.

-  *Failure to follow these procedures and recommendations could invalidate the manufacturer's warranty.*
-  *Failure to follow these procedures or performing unauthorised modifications to the equipment could also invalidate compliance to EMC regulations.*
-  *Please check carefully the packages you have been supplied. If there is a shortage or evidence that any item has suffered transit damage then inform the carrier and AMS Neve as soon as possible.*
-  *Please note that modules, cards or cables should not be "hot-plugged" (i.e. inserted or removed with the power on). Hot-plugging can stress the interface components which may lead to failure. Items returned for repair with this kind of damage are not covered under warranty.*
-  *All front panels must be fitted to the racks to achieve the required cooling. If the rack units are operated with the panels removed overheating will occur and may lead to component failure not covered under warranty.*
-  *Read the following section before starting to power up the system. It is extremely important that the following checks are carried out prior to switch-on.*

### Initial Checks

- Refer to the correct procedures described on the following page when handling static sensitive devices.
- Remove the transit packing carefully and check for any signs of shipment damage.
- Remove the transit disk from the floppy drive in the 4U Encore Processor Unit.
- Ensure all keys on the Keyboard are free from any packing material.

### System Configuration

Two typical system configurations (24 and 48 fader) are included as a guide only and may not necessarily represent your system. Custom interconnects when required are included in a separate section - see contents.

## Static Sensitive Devices Handling Precautions

### Introduction

This Specification details the precautions to be used for the Protection of Semi-Conductor Devices.

Static Charge build up in humans, tools, fixtures etc., could appear as a voltage difference applied between the leads of a device, leaving either immediate or latent damage.

### Component and Package Identification from AMS Neve plc

Containers and Packages holding Semi-Conductive Devices will be suitably marked.

#### Approved containers consist of

- ☐ A rigid plastic container lined with conductive foam.
- ☐ A conductive plastic bag of a size adequate to completely contain the item.

### Handling of Static Sensitive Devices

#### General Precautions

- ☐ Personnel handling these must not wear outer clothing which will generate a static charge. Cotton or linen is preferred. Wool frequently contains man made additives. Nylon or man made fibre outer garments or dust coats must not be worn.
- ☐ Freshly xeroxed/photostat copies can hold a substantial static charge and should be kept well away from static sensitive devices.
- ☐ All bench surfaces where these devices may be handled must be conductive and maintained at earth potential.
- ☐ Before removing a device from the protective material personnel must be adequately earthed. The device should not be handled by its leads.

### Static Sensitive Devices to be returned to AMS Neve plc

All containers and packages containing semi-conductive devices should be suitably marked with a warning 'STATIC SENSITIVE'.

#### Approved containers consist of

- ☐ A rigid plastic container lined with conductive foam.
- ☐ A conductive plastic bag of a size adequate to completely contain the item.

## Cable Lengths

The maximum length of the digital communication cable (Tranlink) between the console and the racks which can be guaranteed to work is 30 metres. However, lengths of up to 50 metres have worked successfully but care must be taken to avoid sharp kinks in the cable and runs in the proximity of interfering signals. The standard length supplied is 10 metres. Any other length should be specified at the time of ordering.

Please note that the AMS Neve AES/EBU interface complies with the BBC AES/EBU specification. This includes operational lengths of interconnecting cable of up to 100 meters. If lengths greater than this are needed, please contact the AMS Neve Contract Engineering Department, stating the operational cable length required.

AES/EBU cable characteristic impedance - 110ohm +/- 20%.

The maximum length of the Keyboard, Trackball and VGA cables between the Encore Processor Unit and the console is 10 metres. Libra is supplied as standard with a 10 metre cable bundle consisting of the following :

|                |                                             |
|----------------|---------------------------------------------|
| Tranlink       | Audio cables for talkback, monitoring, etc. |
| Two VGA cables | Trackball cable                             |
| Keyboard cable |                                             |

If the cable run from the racks to the console is greater than 10 metres then a different set of cables must be specified at the time of ordering. Under these circumstances, the Encore rack must be sited separately from the other rack mounted components no more than 10m cable length away from the console.

There will be three different cable lengths to consider:

- 1) The VGA, Trackball & Keyboard cables will be 10 metres in length.
- 2) The Racks to Console Tranlink is subject to the usual limits for a Tranlink. The Racks to Console Audio cable will be the same length as this Tranlink.
- 3) The Tranlink from the Racks to the Encore rack will need to be specified, depending on where the Encore rack is to be sited, again subject to the usual limits for a Tranlink.

Where screened cables are specified it is important that these are used to maintain EMC compliance.

## Rack-Mounting



The rack units should be installed in a 19" cabinet with access to the front and rear. A rack depth of 700mm minimum is required for clearance of cabling and connectors. Ventilation panels must be provided to allow a free flow of air both across the rack and from the front to the back. It is recommended that chassis support rails are used to provide rear support to all units over 3U.

The 17U rack units are very heavy (over 40kg) and no attempt should be made to move or lift these without assistance.

## Cooling



No specific air conditioning is required for the racks, provided that there is a free flow of air through the rack from front to back, and that the ambient air is maintained below 30 degrees centigrade. Therefore it is an installation requirement that all racks are mounted horizontally.

-  *The bulk power supply requires 150mm (6inches) of clearance front and rear to maintain adequate airflow.*
-  *The MIOS rack is fan cooled and it is recommended that it should not be sited in noise critical environments.*
-  *If the MIOS rack is a 'Stage box' it will use natural cooling and a minimum of 4U should be left above the rack to maintain adequate cooling - **a Stage MIOS box has a vented lid and is fitted with mic-line modules only.***
-  *As the **Encore Processor Unit** and **Multichannel AES I/O Unit** are fan cooled, it is recommended that they should not be sited in noise critical environments. If it is required that the Encore unit is located in the control room, then an enclosure which minimises the noise is recommended.*
-  *Console ventilation slots should not be blocked and air should be free to convect through the console.*
-  *The console must not be powered up or operated with the dust cover in place.*

## Technical Earth



To comply with safety regulations, all AMS Neve systems are supplied to the customer with the mains earth cable connected to the system chassis. It is the customer's responsibility to comply with the local safety regulations; but it is normal practice, after connecting the system to technical earth to remove the 0V to chassis links as shown on the Power and Technical Earth Interconnect diagram.

The mains earth connection to the power supplies must not be disconnected.

## Safety Earth



Some components of this system are designated high earth leakage (>3.5mA from Live to Earth) this means that an earth connection is essential to ensure the safety of the equipment. If this is the case the equipment will be labelled adjacent to the safety earth stud. Separate earth studs are provided on the equipment which can be strapped together with green/yellow cable of 1.25mm<sup>2</sup> or greater. These should be taken to a guaranteed secure earth point within the installation. The reason for this is to guarantee the safety of the equipment even if the safety earth within the mains supply cable should become detached.

## Mains Power

Typical power consumption given below is based on fully populated racks.

The operating voltage of the Console will be supplied set to the correct operating voltage for the customer's application. Check that the voltage selector on the rear of the Encore Processor Rack, Relay Control Unit and Remote 8 Channel Level Control Unit is set to the correct operating voltage. All other rack units are auto voltage sensing.

The input voltage range and fuse rating are engraved on the equipment label adjacent to the mains input connector.

## Power Requirements

| Console          | Power Consumption (Watts) |
|------------------|---------------------------|
| 12 Fader Console | 200                       |
| 24 Fader Console | 250                       |
| 36 Fader Console | 300                       |
| 48 Fader Console | 450                       |
| Meter Bridge     | 150                       |

| System Racks                  | Power Consumption (Watts) |
|-------------------------------|---------------------------|
| Encore Processor Rack         | 150                       |
| Combi-Rack                    | 400                       |
| Combi-Rack (Dual IOS)         | 400                       |
| SPS Rack                      | 800                       |
| MIOS Rack                     | 150                       |
| Relay Control Unit            | 20                        |
| Remote 8Ch Level Control Unit | 20                        |
| Multichannel AES I/O Unit     | 60                        |

## PSU Redundancy



Power supply redundancy is built into the Console Surface, the Encore Processor Rack, the Combi-Racks, the SPS Rack, the MIOS Rack and the Multichannel AES I/O Unit.

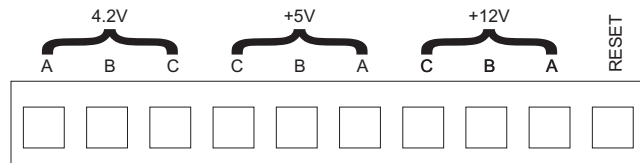
To ensure PSU redundancy is fully supported ALL IEC mains input connectors **MUST** be present at System POWER UP.

### Console Surface Power Supplies - 48 Fader Systems

The console is fed with three separate mains inputs.

 The PSU status LEDs can be viewed from the rear of the console through the rear panel slots.

There are 10 red LEDs, the extreme right hand LED indicates RESET, the other 9 LEDs indicate the status of the 3 rails, +4.2V, +5V and +12V of the three current sharing PSUs A,B and C.



PSU Status indicators for 48 Fader Libra Live  
View on Rear of Console through rear panel slots

Under normal load conditions (i.e. **console booted**), ALL 9 LEDs of the PSU monitoring circuit board should be illuminated. If ANY of the red LEDs are OFF then this indicates a PSU rail failure which should be investigated as soon as possible.

 During the boot sequence or if the console fails to boot some of the PSU monitoring LEDs may not be illuminated. This is an indeterminate state which may or may not indicate PSU failure.

### Encore Processor Rack

The Encore processor rack is fitted with two separate PSU switches located adjacent to the mains input connector. In normal operation, (to provide redundancy) both switches must be ON. The LED will illuminate green when the supply rails are healthy. If a fault develops or one of the two supplies is switched off the LED will indicate red. This will be accompanied by an audible warning which can be switched off by toggling the adjacent red button if desired. Any fault should be investigated as soon as possible.

### Combi-Racks, SPS Rack, MIOS Rack and Multichannel AES I/O Unit

These racks are fitted with a red indicator on the front panel. If all power supplies are healthy then the red indicator will be constantly illuminated.

If a red indicator on a front panel is flashing then this indicates a PSU rail failure on the rack which should be investigated as soon as possible.

### Power Supply Unit (PSU) Status Port

The Combi-Racks, SPS Rack and Multichannel AES I/O Unit are fitted with a PSU Status Port located on the rear panel above the mains input connectors. This is a 9 way D type connected to two relays.

With both supplies healthy Relays 1 and 2 will be closed. If one of the supplies fails then the respective relay will open.

These relay connections can be used to provide remote indication of power supply status if required.

**Mating Connector Required:** 9-way D Type Female

**Relay Switch Contact Rating:** 100V(max) , 0.5A(max), 10W(max)



## Console Data

Refer to the drawings at the back of this manual.

 The height figures given below include the Meter Bridge.

| Frame Size | Length<br>mm (inches) | Depth<br>mm (inches) | Height<br>mm (inches) | Approx. Weight<br>kg (lbs) |
|------------|-----------------------|----------------------|-----------------------|----------------------------|
| 12 Fader   | 950 (37¼)             | 975 (38¼)            | 395 (15½)             | 80 (176)                   |
| 24 Fader   | 1464 (57½)            | 921 (36)             | 1032 (40½)            | 120 (264)                  |
| 30 Fader   | 1711 (67)             | 921 (36)             | 1032 (40½)            | 135 (297)                  |
| 48 Fader   | 2452 (96½)            | 921 (36)             | 1032 (40½)            | 175 (385)                  |

## Rack Data

| Rack Type                     | U  | Depth<br>mm (inches) | Height<br>mm (inches) | Approx. Weight<br>kg (lbs) |
|-------------------------------|----|----------------------|-----------------------|----------------------------|
| Encore Processor              | 4  | 460 (18)             | 178 (7)               | 30 (66)                    |
| Combi-Rack                    | 17 | 572 (22½)            | 756 (29¾)             | 70 (154)                   |
| Combi-Rack (Dual IOS)         | 17 | 572 (22½)            | 756 (29¾)             | 70 (154)                   |
| System SPS Rack               | 17 | 572 (22½)            | 756 (29¾)             | 70 (154)                   |
| MIOS Rack                     | 4  | 490 (19)             | 178 (7)               | 21 (46) *                  |
| Relay Control Unit            | 2  | 254 (10)             | 89 (3½)               | 8 (18)                     |
| Remote 8Ch Level Control Unit | 2  | 254 (10)             | 89 (3½)               | 8 (18)                     |
| Multichannel AES I/O Unit     | 2  | 425 (17)             | 89 (3½)               | 9 (20)                     |

\* The weight of the MIOS rack is based on a rack populated with 6 mic modules.

## Connecting the System

When the units are in position and all the cables have been identified and prepared, connect the system as shown in the Custom Interconnect section.

### Console to Racks Audio Interconnect

The Audio Cable from the Console is supplied with cable ends stripped and tinned only ready for custom installation requirements.

### XLR Pin Outs

The pin out for XLRs is:

- ☐ Pin 1, Screen
- ☐ Pin 2, Phase (or Hot)
- ☐ Pin 3, Anti-Phase (or Cold)

and for dual circuit connectors:

- ☐ Pin 4, Phase (or Hot), second circuit (or B channel)
- ☐ Pin 5, Anti-Phase (or Cold), second circuit (or B channel)

Pin 1 for outputs is directly connected to the chassis. Pin 1 for inputs is R.F. coupled to the chassis to provide a screen but avoiding hum loop problems. The exception is the Mic/Line Unit where pin 1 for inputs is directly connected to chassis to provide phantom power.

The shell connection of the XLR connector is a direct connection to the chassis and should be used for the O/P screen connection as this gives an improved R.F. connection and screening.

### Meter Bridge VU Meters

If the console is supplied with the optional Meter Bridge the input connector to the 2 VU meters is made via the 'AUXILIARY' port on the console connector panel.

#### Mating Connector Required: 15-way D type male

| VU Meter | Signal | Pin No. |
|----------|--------|---------|
| L        | Hot    | 1       |
|          | Cold   | 10      |
| R        | Hot    | 2       |
|          | Cold   | 11      |

### Audio Signals

All audio from the ADC and DAC cards are balance audio signals.

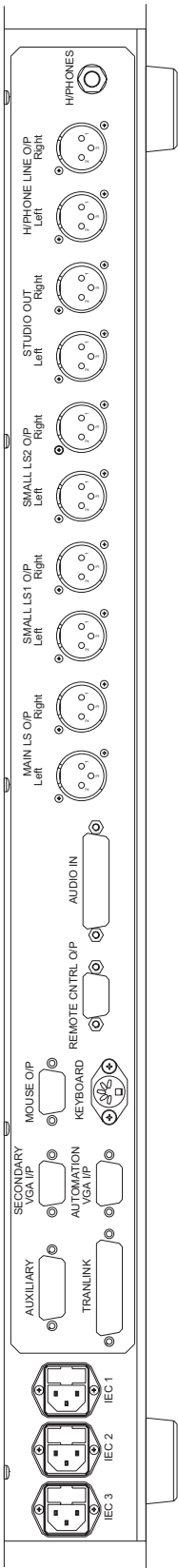
## **VARICON TABLES AND CUSTOM INTERCONNECTS**

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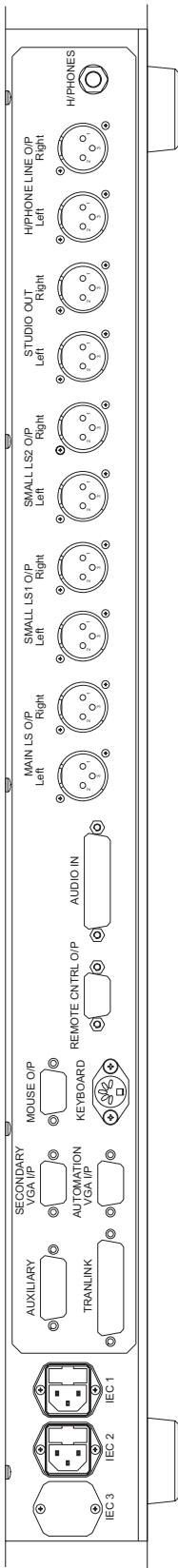
Varicon tables and custom interconnects are shown on the following pages:

CONNECTOR DETAILS

Console Connections



48 Fader Console



24 Fader Console

## Audio Input Cable Wiring

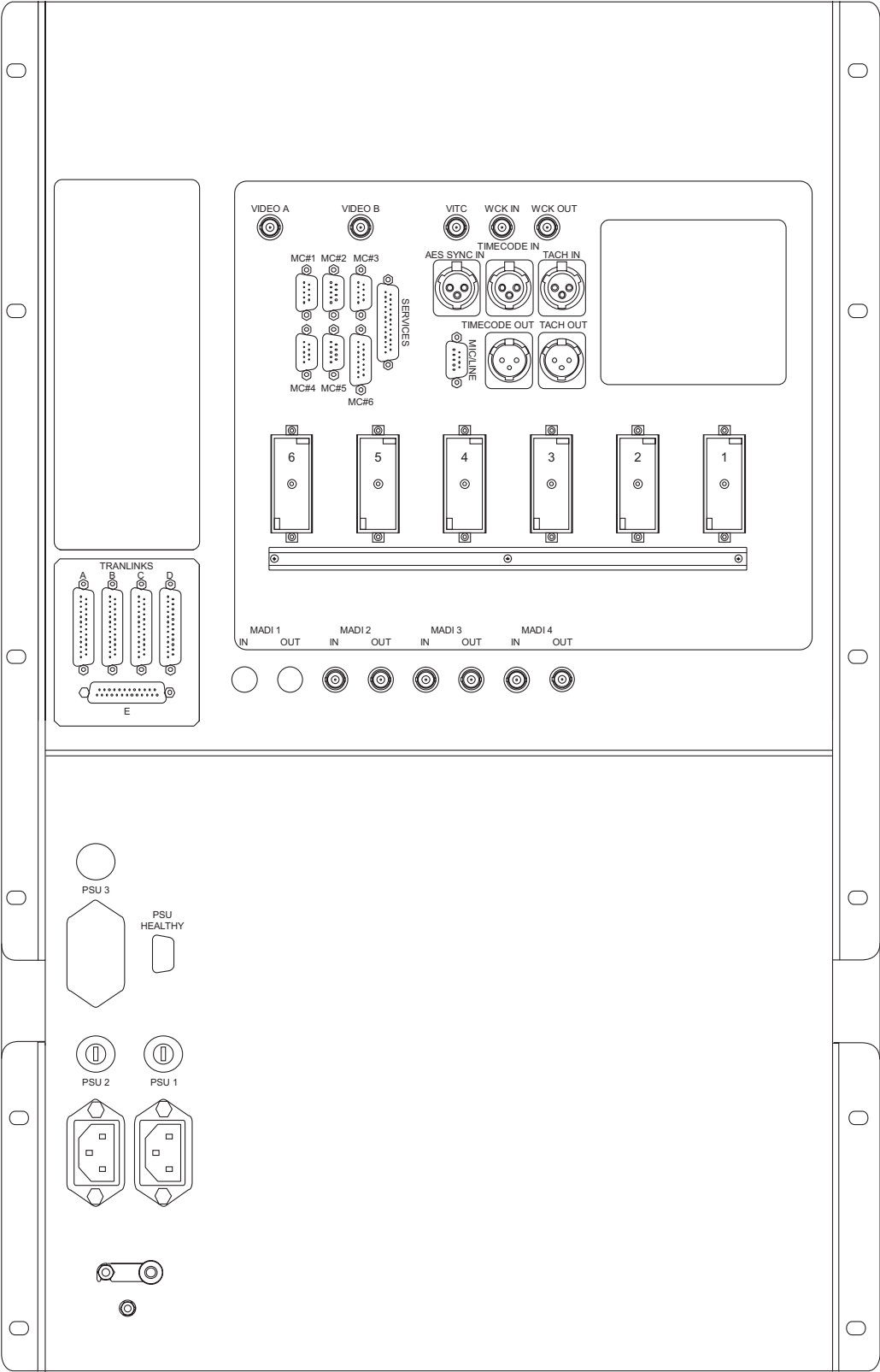
**Location:** Rear of Console

**Mating Connector:** 25-way D type male

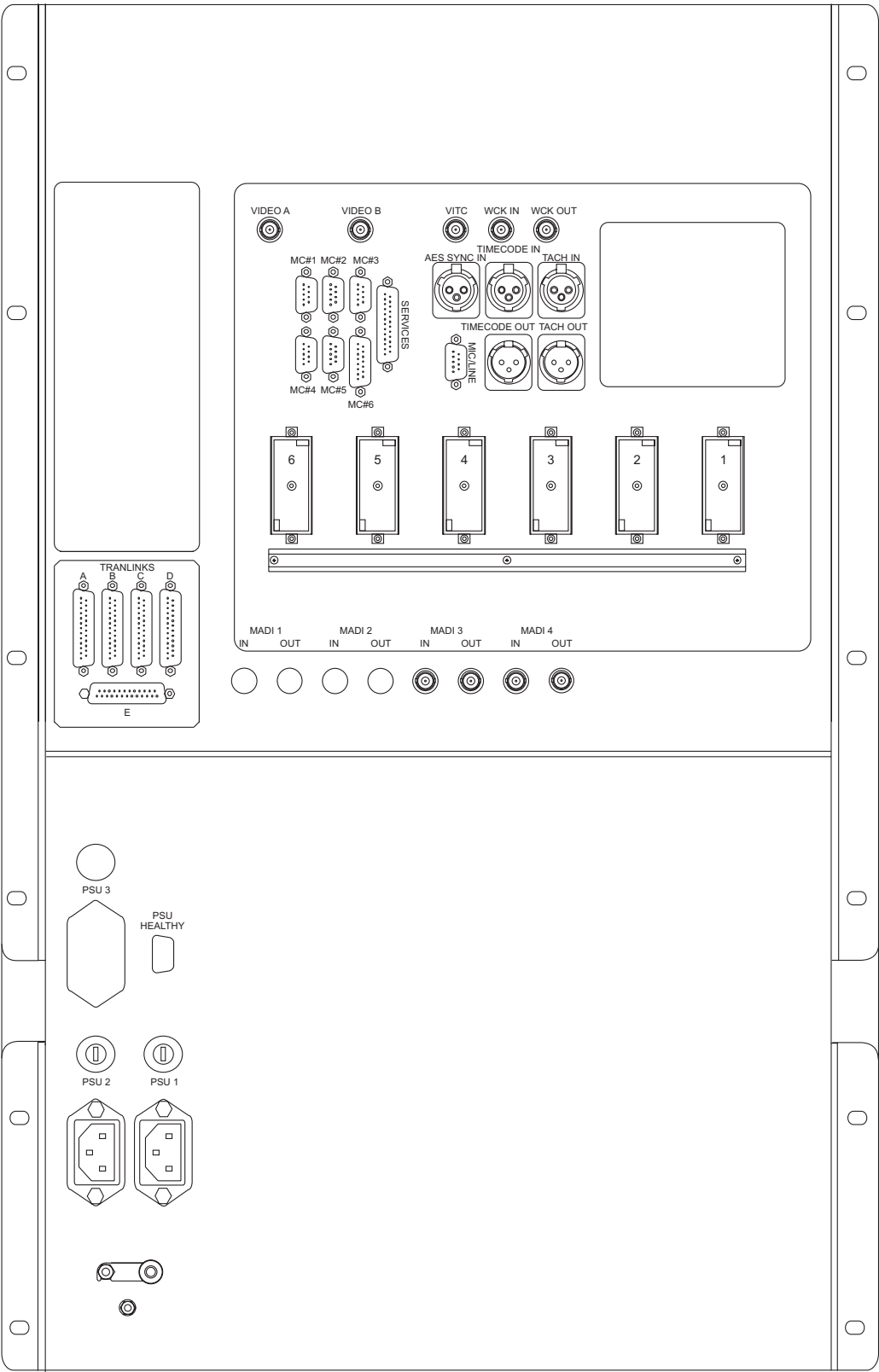
**Cabling Information:** Use high quality screened twisted-pair cable

| Pin No.  |        | Signal          |
|----------|--------|-----------------|
| 1<br>14  | +<br>- | Monitor 1 Left  |
| 2<br>15  | +<br>- | Monitor 1 Right |
| 3<br>16  | +<br>- | Monitor 2 Left  |
| 4<br>17  | +<br>- | Monitor 2 Right |
| 5<br>18  | +<br>- | Studio Left     |
| 6<br>19  | +<br>- | Studio Right    |
| 7<br>20  | +<br>- | Phones Left     |
| 8<br>21  | +<br>- | Phones Right    |
| 9<br>22  | +<br>- | VU Left         |
| 10<br>23 | +<br>- | VU Right        |
| 11<br>24 | +<br>- | Talkback        |

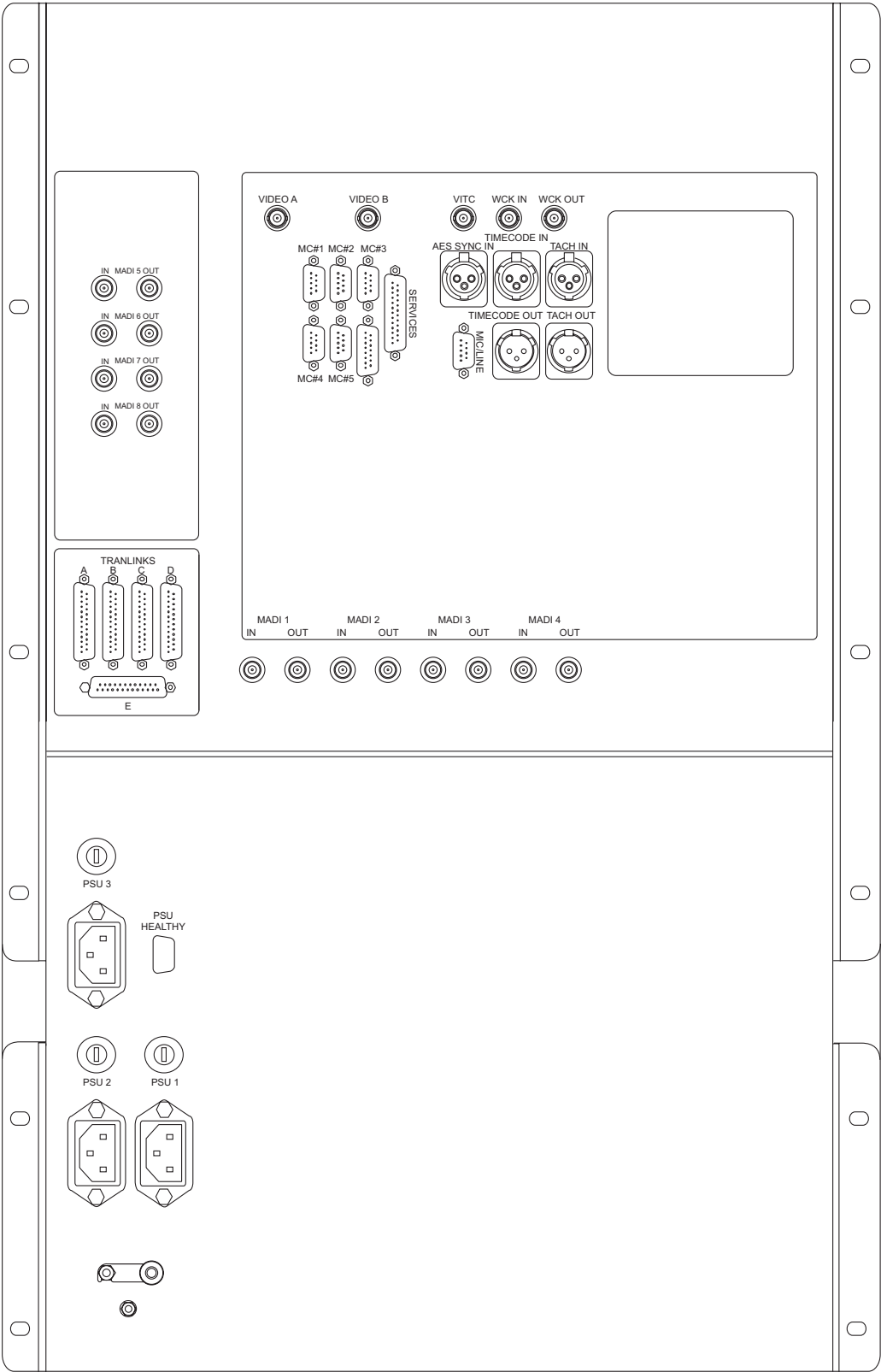
Combi-Rack



Combi-Rack (Dual IOS)



SPS Rack



# **MACHINE CONTROL PORTS #1,#2,#3,#4 and #5**

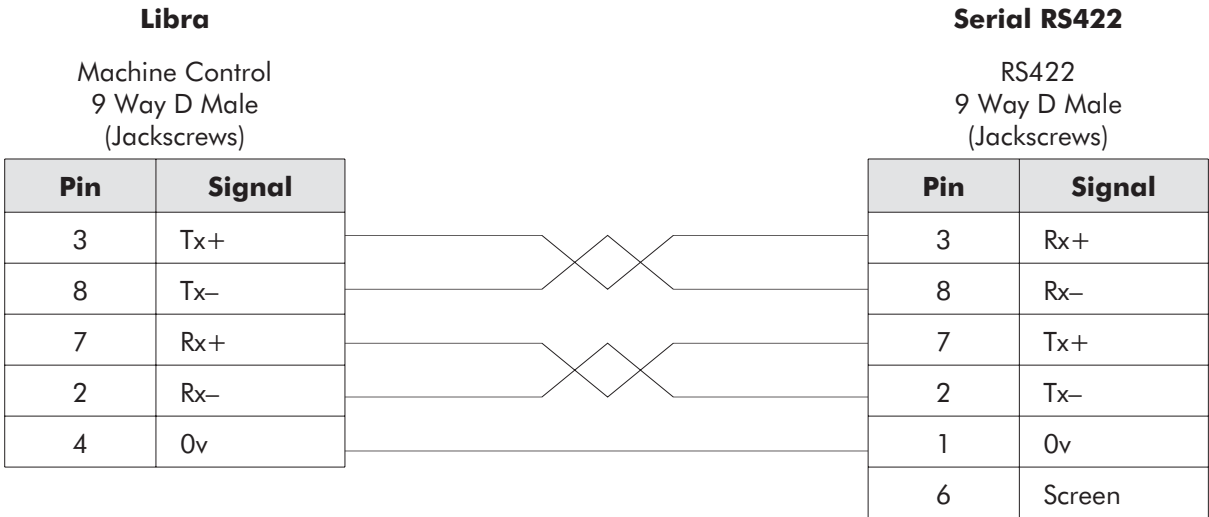
**Location:** Rear of Combi-Rack or SPS Rack  
**Mating connector:** DE 9P  
**Cabling Information:** Use a twisted pair screened cable with EMC hoods. Twisted pairs should be used with Rx-, Rx+ and Tx-, Tx+ as twisted pairs. The cable screen should be 360° terminated to an EMC backshell at each end.

| Pin No. | Signal |
|---------|--------|
| 1       | GND    |
| 2       | RX-    |
| 3       | TX+    |
| 4       | GND    |
| 5       | RTS    |
| 6       | GND    |
| 7       | RX+    |
| 8       | TX-    |
| 9       | GND    |

**MACHINE CONTROL PORTS #1,#2,#3,#4 and #5**

**Serial RS422 Device e.g. Sony 9-pin (P2 Protocol)**

**Location:** Rear of Combi-Rack or SPS Rack  
**Cabling Information:** Use high quality screened twisted-pair cable, paying careful attention to correct pairing. Screens should be 360° terminated to EMC backshells at both ends. Length as required – recommended maximum 50m.

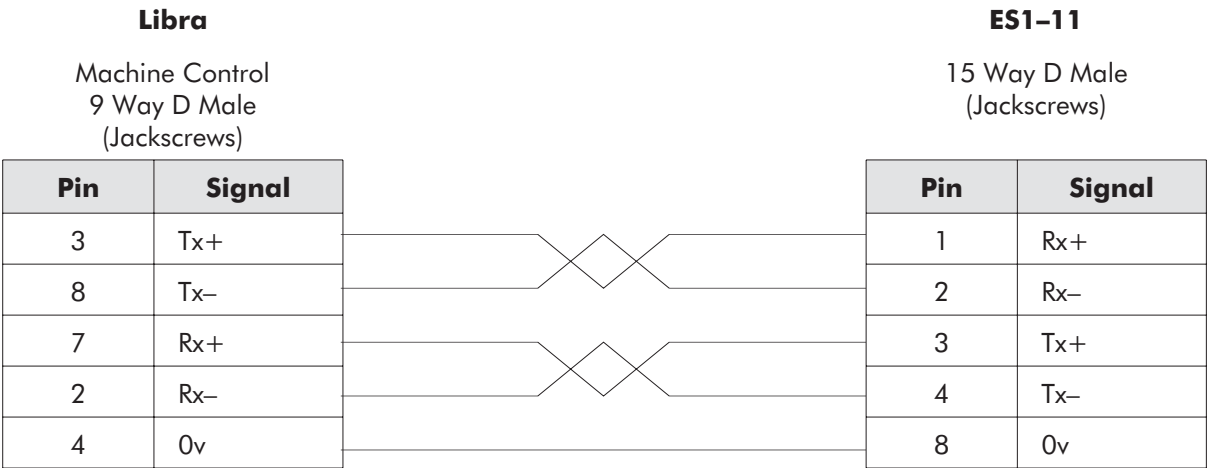


MACHINE CONTROL PORT #2 & #4

ES1-11 Cable (also ES1-12, ES/2, Synchronet)

Location:  
Cabling Information:

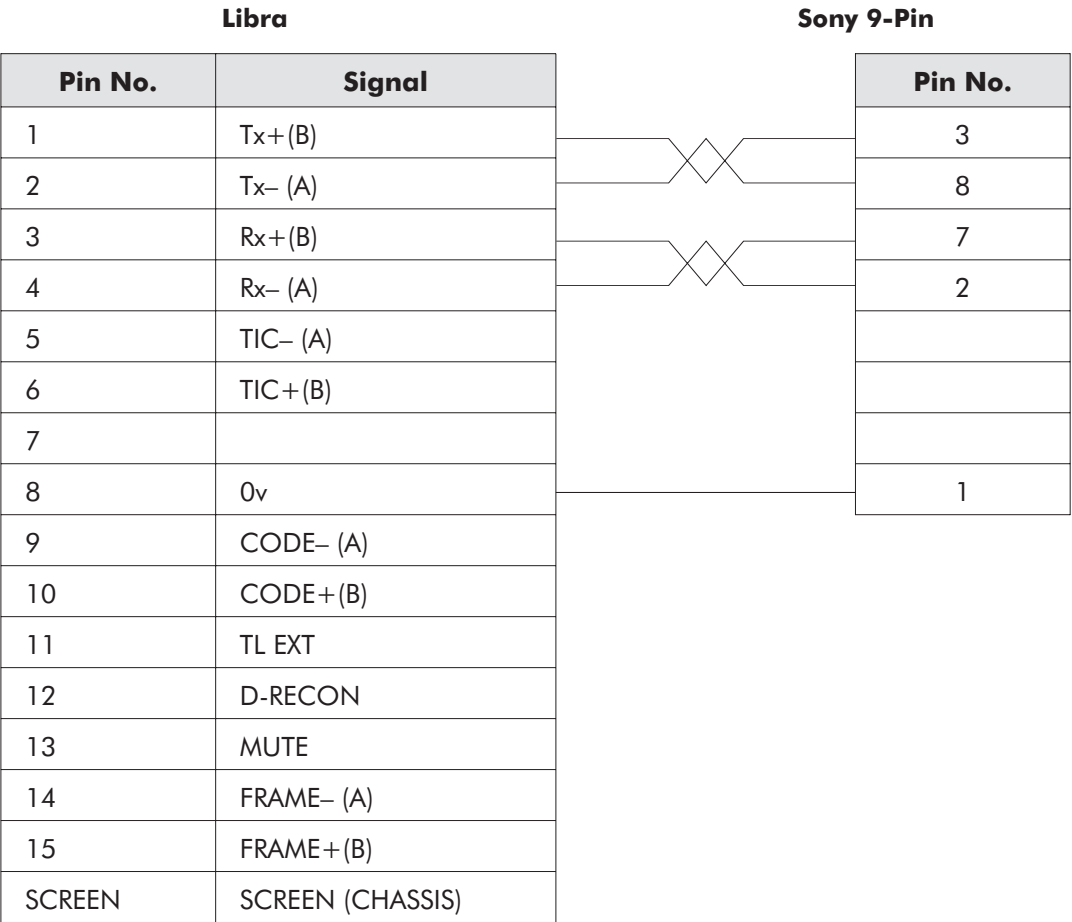
Rear of Combi-Rack or SPS Rack  
Use high quality screened twisted-pair cable, paying careful attention to correct pairing.  
A screened twisted-pair cable should also be used for the XLR connection with the screens connected to both ends.  
Screens should be 360° terminated to EMC backshells at both ends.  
Length as required – recommended maximum 50m.



MACHINE CONTROL PORT #6

Location:  
Mating connector:  
Cabling Information:

Rear of Combi-Rack or SPS Rack  
DA 15 P  
A screened twisted-pair cable should be used with the screens 360° terminated to EMC backshells at both ends.  
Signal pairs 1 & 2, 3 & 4, 5 & 6, 9 & 10 and 14 & 15 should all use twisted pairs of the same cable.



# **MACHINE CONTROL PORT #6**

**Location:** Rear of Combi-Rack or SPS Rack  
**Mating connector:** DA 15 P

| Libra   |                  | Standard ES Bus Cable | ES1-11, ES1- 12, ES/2, Synchronet |                  |
|---------|------------------|-----------------------|-----------------------------------|------------------|
| Pin No. | Signal           |                       | Pin No.                           | Signal           |
| 1       | Tx+(B)           |                       | 1                                 | RX+              |
| 2       | Tx- (A)          |                       | 2                                 | RX-              |
| 3       | Rx+(B)           |                       | 3                                 | TX+              |
| 4       | Rx- (A)          |                       | 4                                 | TX-              |
| 5       | TIC- (A)         |                       | 5                                 | TIC-             |
| 6       | TIC+(B)          |                       | 6                                 | TIC+             |
| 7       |                  | NO WIRE               | 7                                 | +5               |
| 8       | 0v               |                       | 8                                 | 0v               |
| 9       | CODE- (A)        |                       | 9                                 | CODE- (A)        |
| 10      | CODE+(B)         |                       | 10                                | CODE+(B)         |
| 11      | TL EXT           |                       | 11                                | TL EXT           |
| 12      | D-RECON          |                       | 12                                | D-RECON          |
| 13      | MUTE             |                       | 13                                | MUTE             |
| 14      | FRAME- (A)       |                       | 14                                | FRAME- (A)       |
| 15      | FRAME+(B)        |                       | 15                                | FRAME+(B)        |
| SCREEN  | SCREEN (CHASSIS) |                       | SHELL                             | SCREEN (CHASSIS) |

## SERVICES PORT

**Location:**  
**Mating connector:**  
**Cabling Information:**

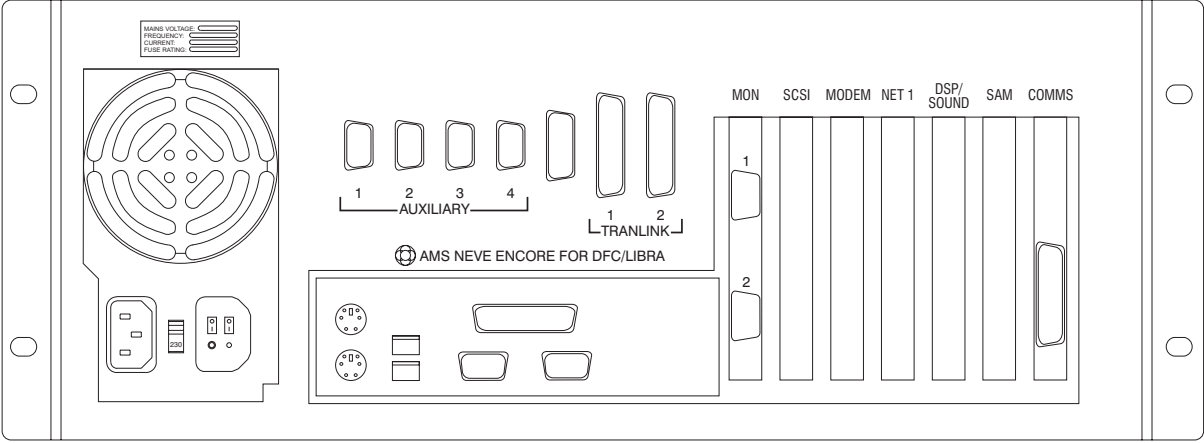
**Rear of Combi-Rack or SPS Rack**  
**DB 25 P**

**A screened twisted-pair cable should be used with the screens 360° terminated to EMC backshells at both ends.**

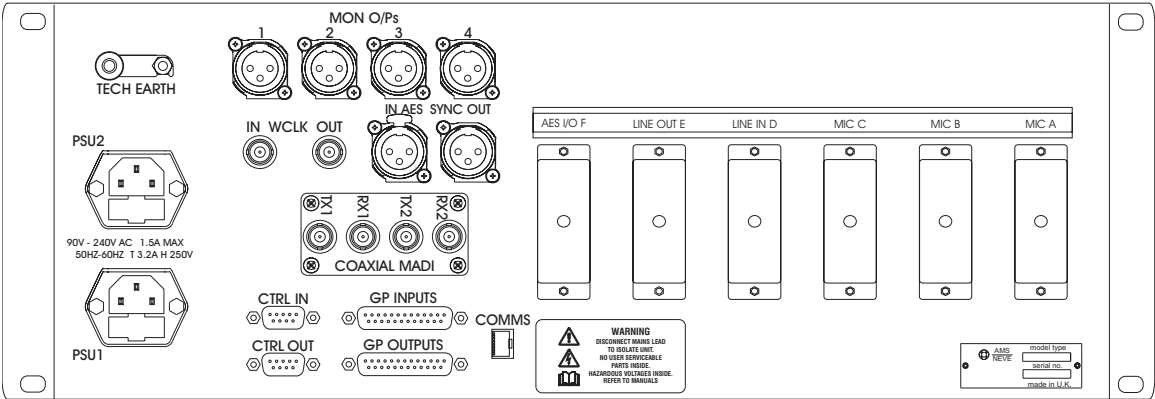
**If this port is taken to more than one destination then all cable screens must still be terminated to EMC backshells.**

| Pin No. | Signal           |
|---------|------------------|
| 1       |                  |
| 2       |                  |
| 3       |                  |
| 4       |                  |
| 5       |                  |
| 6       |                  |
| 7       |                  |
| 8       |                  |
| 9       |                  |
| 10      |                  |
| 11      |                  |
| 14      | SYNC COM         |
| 15      | SYNC NC          |
| 16      | SYNC NO          |
| 17      | RL1 COM REC      |
| 18      | RL1 NC REC       |
| 19      | RL1 NO REC       |
| 20      | RL2 COM PLAY/ADR |
| 21      | RL2 NC PLAY/ADR  |
| 22      | RL2 NO PLAY/ADR  |

Encore Processor Rack



MIOS Rack



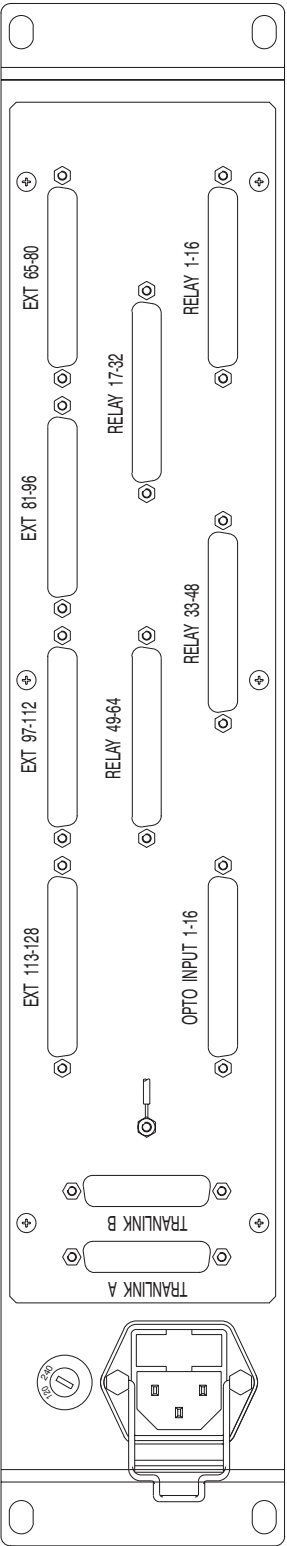
See MIOS User Guide for more information.

56 Way Varicon Connections

All connectors on the rear panel are 56 pin Varicon (Elco, Varelco, etc), male.

| PIN |        | Mic In Module | Line In Module | Line Out Module | AES I/O Module |
|-----|--------|---------------|----------------|-----------------|----------------|
| E   | Hot    | Mic In 1 A    | Line In 1      | Line Out 1      | AES In 1/2     |
| F   | Cold   |               |                |                 |                |
| A   | Screen |               |                |                 |                |
| B   | Hot    | Mic In 2 A    | Line In 2      | Line Out 2      | AES In 3/4     |
| C   | Cold   |               |                |                 |                |
| H   | Screen |               |                |                 |                |
| J   | Hot    | Mic In 2 B    | Line In 3      | Line Out 3      | AES In 5/6     |
| K   | Cold   |               |                |                 |                |
| D   | Screen |               |                |                 |                |
| R   | Hot    | Mic In 1 B    | Line In 4      | Line Out 4      | AES In 7/8     |
| S   | Cold   |               |                |                 |                |
| L   | Screen |               |                |                 |                |
| M   | Hot    | Mic In 3 A    | Line In 5      | Line Out 5      | AES In 9/10    |
| N   | Cold   |               |                |                 |                |
| T   | Screen |               |                |                 |                |
| U   | Hot    | Mic In 4 A    | Line In 6      | Line Out 6      | AES In 11/12   |
| V   | Cold   |               |                |                 |                |
| P   | Screen |               |                |                 |                |
| a   | Hot    | Mic In 3 B    | Line In 7      | Line Out 7      | AES In 13/14   |
| b   | Cold   |               |                |                 |                |
| W   | Screen |               |                |                 |                |
| c   | Hot    | Mic In 4 B    | Line In 8      | Line Out 8      | AES In 15/16   |
| d   | Cold   |               |                |                 |                |
| Z   | Screen |               |                |                 |                |
| k   | Hot    |               | Line In 9      | Line Out 9      | AES Out 1/2    |
| l   | Cold   |               |                |                 |                |
| p   | Screen |               |                |                 |                |
| m   | Hot    |               | Line In 10     | Line Out 10     | AES Out 3/4    |
| n   | Cold   |               |                |                 |                |
| t   | Screen |               |                |                 |                |
| u   | Hot    |               | Line In 11     | Line Out 11     | AES Out 5/6    |
| v   | Cold   |               |                |                 |                |
| z   | Screen |               |                |                 |                |
| AA  | Hot    |               | Line In 12     | Line Out 12     | AES Out 7/8    |
| BB  | Cold   |               |                |                 |                |
| w   | Screen |               |                |                 |                |
| x   | Hot    | Line In 2     | Line In 13     | Line Out 13     | AES Out 9/10   |
| y   | Cold   |               |                |                 |                |
| CC  | Screen |               |                |                 |                |
| DD  | Hot    | Line In 1     | Line In 14     | Line Out 14     | AES Out 11/12  |
| EE  | Cold   |               |                |                 |                |
| KK  | Screen |               |                |                 |                |
| LL  | Hot    | Line In 3     | Line In 15     | Line Out 15     | AES Out 13/14  |
| MM  | Cold   |               |                |                 |                |
| FF  | Screen |               |                |                 |                |
| HH  | Hot    | Line In 4     | Line In 16     | Line Out 16     | AES Out 15/16  |
| JJ  | Cold   |               |                |                 |                |
| NN  | Screen |               |                |                 |                |

Relay Control Unit (Fader Start)



## RELAY CONNECTORS

**Location:** Rear of Relay Control Unit

**Mating connector required:** 37-way D type male

**PINOUT : 37 WAY RELAY LOOP D'S**

**MAX CURRENT THROUGH EACH PAIR : 0.5A**

**MAX VOLTAGE ON RELAY CONTACTS : 100V**

| 'RELAY 1-16' |     |     |
|--------------|-----|-----|
|              | PIN | PIN |
| RELAY 1      | 1   | 20  |
| RELAY 2      | 2   | 21  |
| RELAY 3      | 3   | 22  |
| RELAY 4      | 4   | 23  |
| RELAY 5      | 5   | 24  |
| RELAY 6      | 6   | 25  |
| RELAY 7      | 7   | 26  |
| RELAY 8      | 8   | 27  |
| RELAY 9      | 9   | 28  |
| RELAY 10     | 10  | 29  |
| RELAY 11     | 11  | 30  |
| RELAY 12     | 12  | 31  |
| RELAY 13     | 13  | 32  |
| RELAY 14     | 14  | 33  |
| RELAY 15     | 15  | 34  |
| RELAY 16     | 16  | 35  |

| 'RELAY 17-32' |     |     |
|---------------|-----|-----|
|               | PIN | PIN |
| RELAY 17      | 1   | 20  |
| RELAY 18      | 2   | 21  |
| RELAY 19      | 3   | 22  |
| RELAY 20      | 4   | 23  |
| RELAY 21      | 5   | 24  |
| RELAY 22      | 6   | 25  |
| RELAY 23      | 7   | 26  |
| RELAY 24      | 8   | 27  |
| RELAY 25      | 9   | 28  |
| RELAY 26      | 10  | 29  |
| RELAY 27      | 11  | 30  |
| RELAY 28      | 12  | 31  |
| RELAY 29      | 13  | 32  |
| RELAY 30      | 14  | 33  |
| RELAY 31      | 15  | 34  |
| RELAY 32      | 16  | 35  |

| 'RELAY 33-48' |     |     |
|---------------|-----|-----|
|               | PIN | PIN |
| RELAY 33      | 1   | 20  |
| RELAY 34      | 2   | 21  |
| RELAY 35      | 3   | 22  |
| RELAY 36      | 4   | 23  |
| RELAY 37      | 5   | 24  |
| RELAY 38      | 6   | 25  |
| RELAY 39      | 7   | 26  |
| RELAY 40      | 8   | 27  |
| RELAY 41      | 9   | 28  |
| RELAY 42      | 10  | 29  |
| RELAY 43      | 11  | 30  |
| RELAY 44      | 12  | 31  |
| RELAY 45      | 13  | 32  |
| RELAY 46      | 14  | 33  |
| RELAY 47      | 15  | 34  |
| RELAY 48      | 16  | 35  |

| 'RELAY 49-64' |     |     |
|---------------|-----|-----|
|               | PIN | PIN |
| RELAY 49      | 1   | 20  |
| RELAY 50      | 2   | 21  |
| RELAY 51      | 3   | 22  |
| RELAY 52      | 4   | 23  |
| RELAY 53      | 5   | 24  |
| RELAY 54      | 6   | 25  |
| RELAY 55      | 7   | 26  |
| RELAY 56      | 8   | 27  |
| RELAY 57      | 9   | 28  |
| RELAY 58      | 10  | 29  |
| RELAY 59      | 11  | 30  |
| RELAY 60      | 12  | 31  |
| RELAY 61      | 13  | 32  |
| RELAY 62      | 14  | 33  |
| RELAY 63      | 15  | 34  |
| RELAY 64      | 16  | 35  |

## OPTO-ISOLATED READER INPUTS

**Location:**            **Rear of Relay Control Unit**

**Mating connector required: 37-way D type male**

OPTO-ISOLATED READER INPUTS : 'OPTO INPUT 1-16'

**Notes :**

+5v MUST be connected via 470 ohm resistor to limit current into opto inputs to 10mA.

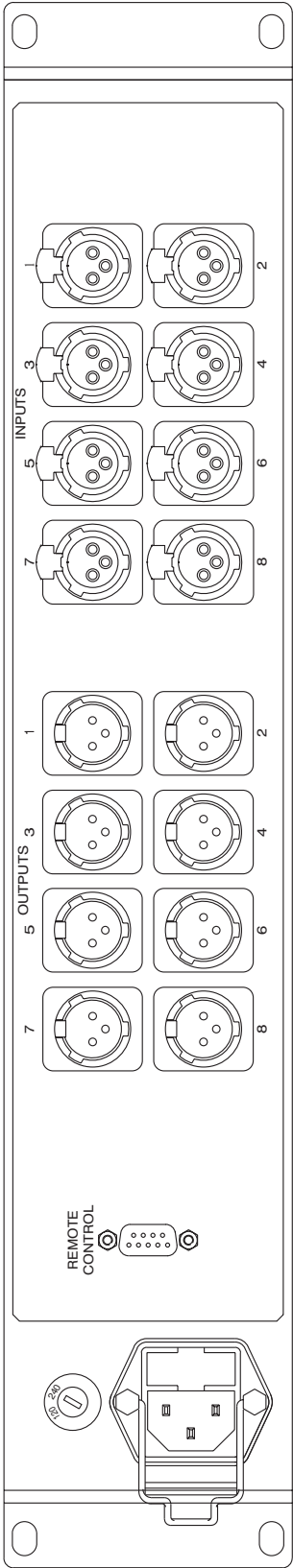
Rec Tally MUST be connected via a series 2.7k ohm resistor to limit current into opto inputs.

Record & Play Tallies for Multitrack shown below are Active Low.

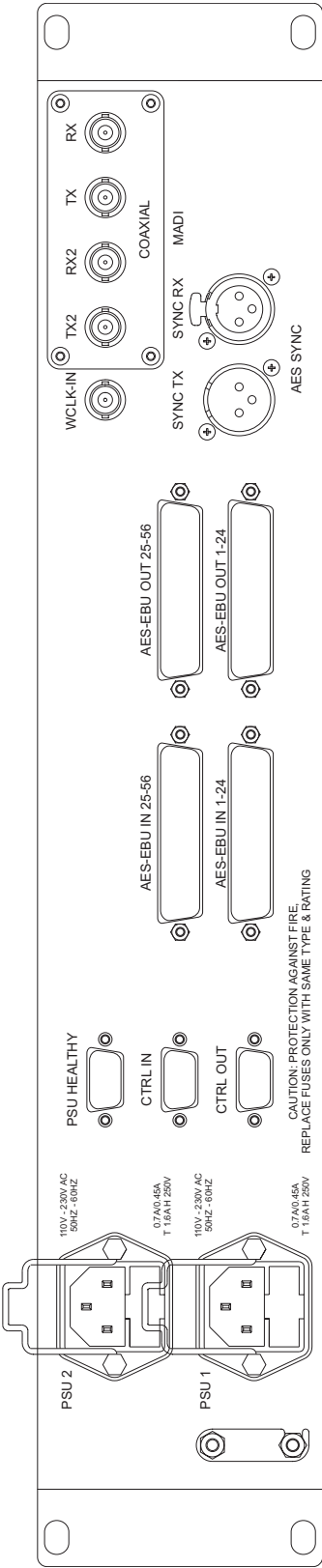
To make Multitrack Rec & Play Tallies High, connect Relay Pin #1 via a 470 ohm resistor to the +5V (Record) line, and connect Relay Pin #20 to +0v without any resistor.

| 'OPTO-INPUT 1-16' |     |     |
|-------------------|-----|-----|
|                   | PIN | PIN |
| INPUT 1           | 1   | 20  |
| INPUT 2           | 2   | 21  |
| INPUT 3           | 3   | 22  |
| INPUT 4           | 4   | 23  |
| INPUT 5           | 5   | 24  |
| INPUT 6           | 6   | 25  |
| INPUT 7           | 7   | 26  |
| INPUT 8           | 8   | 27  |
| INPUT 9           | 9   | 28  |
| INPUT 10          | 10  | 29  |
| INPUT 11          | 11  | 30  |
| INPUT 12          | 12  | 31  |
| INPUT 13          | 13  | 32  |
| INPUT 14          | 14  | 33  |
| INPUT 15          | 15  | 34  |
| INPUT 16          | 16  | 35  |

Remote 8 Channel Level Control Unit



Multichannel AES I/O Unit



## AES-EBU IN - Standard I/O

**Location:** Rear of Multichannel AES I/O Unit

**Mating connector required:** 37-way D type male

| Pin No. | Signal type | Channel     |
|---------|-------------|-------------|
| 37      | Hot         | AES 1AB In  |
| 36      | Cold        |             |
| 18      | Screen      |             |
| 17      | Hot         | AES 2AB In  |
| 16      | Cold        |             |
| 35      | Screen      |             |
| 34      | Hot         | AES 3AB In  |
| 33      | Cold        |             |
| 15      | Screen      |             |
| 14      | Hot         | AES 4AB In  |
| 13      | Cold        |             |
| 32      | Screen      |             |
| 31      | Hot         | AES 5AB In  |
| 30      | Cold        |             |
| 12      | Screen      |             |
| 11      | Hot         | AES 6AB In  |
| 10      | Cold        |             |
| 29      | Screen      |             |
| 28      | Hot         | AES 7AB In  |
| 27      | Cold        |             |
| 9       | Screen      |             |
| 8       | Hot         | AES 8AB In  |
| 7       | Cold        |             |
| 26      | Screen      |             |
| 25      | Hot         | AES 9AB In  |
| 24      | Cold        |             |
| 6       | Screen      |             |
| 5       | Hot         | AES 10AB In |
| 4       | Cold        |             |
| 23      | Screen      |             |
| 22      | Hot         | AES 11AB In |
| 21      | Cold        |             |
| 3       | Screen      |             |
| 2       | Hot         | AES 12AB In |
| 1       | Cold        |             |
| 20      | Screen      |             |

## AES-EBU OUT - Standard I/O

**Location:** Rear of Multichannel AES I/O Unit

**Mating connector required:** 37-way D type male

| Pin No. | Signal type | Channel      |
|---------|-------------|--------------|
| 37      | Hot         | AES 1AB Out  |
| 36      | Cold        |              |
| 18      | Screen      |              |
| 17      | Hot         | AES 2AB Out  |
| 16      | Cold        |              |
| 35      | Screen      |              |
| 34      | Hot         | AES 3AB Out  |
| 33      | Cold        |              |
| 15      | Screen      |              |
| 14      | Hot         | AES 4AB Out  |
| 13      | Cold        |              |
| 32      | Screen      |              |
| 31      | Hot         | AES 5AB Out  |
| 30      | Cold        |              |
| 12      | Screen      |              |
| 11      | Hot         | AES 6AB Out  |
| 10      | Cold        |              |
| 29      | Screen      |              |
| 28      | Hot         | AES 7AB Out  |
| 27      | Cold        |              |
| 9       | Screen      |              |
| 8       | Hot         | AES 8AB Out  |
| 7       | Cold        |              |
| 26      | Screen      |              |
| 25      | Hot         | AES 9AB Out  |
| 24      | Cold        |              |
| 6       | Screen      |              |
| 5       | Hot         | AES 10AB Out |
| 4       | Cold        |              |
| 23      | Screen      |              |
| 22      | Hot         | AES 11AB Out |
| 21      | Cold        |              |
| 3       | Screen      |              |
| 2       | Hot         | AES 12AB Out |
| 1       | Cold        |              |
| 20      | Screen      |              |

## AUX AES-EBU IN - Optional Expansion 1 or 2 Cards

**Location:** Rear of Multichannel AES I/O Unit

**Mating connector required:** 50-way D type male

| Pin No.        | Signal type           | Channel     |             |
|----------------|-----------------------|-------------|-------------|
|                |                       | 1 Exp. Card | 2 Exp.Card  |
| 33<br>49<br>16 | Hot<br>Cold<br>Screen | AES 13AB In | AES 13AB In |
| 15<br>32<br>48 | Hot<br>Cold<br>Screen | AES 14AB In | AES 14AB In |
| 31<br>47<br>14 | Hot<br>Cold<br>Screen | AES 15AB In | AES 15AB In |
| 13<br>30<br>46 | Hot<br>Cold<br>Screen | AES 16AB In | AES 16AB In |
| 29<br>45<br>12 | Hot<br>Cold<br>Screen | AES 17AB In | AES 17AB In |
| 11<br>28<br>44 | Hot<br>Cold<br>Screen | AES 18AB In | AES 18AB In |
| 27<br>43<br>10 | Hot<br>Cold<br>Screen | AES 19AB In | AES 19AB In |
| 9<br>26<br>42  | Hot<br>Cold<br>Screen | AES 20AB In | AES 20AB In |
| 25<br>41<br>8  | Hot<br>Cold<br>Screen |             | AES 21AB In |
| 7<br>24<br>40  | Hot<br>Cold<br>Screen |             | AES 22AB In |
| 23<br>39<br>6  | Hot<br>Cold<br>Screen |             | AES 23AB In |
| 5<br>22<br>38  | Hot<br>Cold<br>Screen |             | AES 24AB In |
| 21<br>37<br>4  | Hot<br>Cold<br>Screen |             | AES 25AB In |
| 3<br>20<br>36  | Hot<br>Cold<br>Screen |             | AES 26AB In |
| 19<br>35<br>2  | Hot<br>Cold<br>Screen |             | AES 27AB In |
| 1<br>18<br>34  | Hot<br>Cold<br>Screen |             | AES 28AB In |

## AUX AES-EBU OUT - Optional Expansion 3 or 4 Cards

**Location:** Rear of Multichannel AES I/O Unit

**Mating connector required:** 50-way D type male

| Pin No.        | Signal type           | Channel      |              |
|----------------|-----------------------|--------------|--------------|
|                |                       | 3 Exp. Card  | 4 Exp. Card  |
| 33<br>49<br>16 | Hot<br>Cold<br>Screen | AES 13AB Out | AES 13AB Out |
| 15<br>32<br>48 | Hot<br>Cold<br>Screen | AES 14AB Out | AES 14AB Out |
| 31<br>47<br>14 | Hot<br>Cold<br>Screen | AES 15AB Out | AES 15AB Out |
| 13<br>30<br>46 | Hot<br>Cold<br>Screen | AES 16AB Out | AES 16AB Out |
| 29<br>45<br>12 | Hot<br>Cold<br>Screen | AES 17AB Out | AES 17AB Out |
| 11<br>28<br>44 | Hot<br>Cold<br>Screen | AES 18AB Out | AES 18AB Out |
| 27<br>43<br>10 | Hot<br>Cold<br>Screen | AES 19AB Out | AES 19AB Out |
| 9<br>26<br>42  | Hot<br>Cold<br>Screen | AES 20AB Out | AES 20AB Out |
| 25<br>41<br>8  | Hot<br>Cold<br>Screen |              | AES 21AB Out |
| 7<br>24<br>40  | Hot<br>Cold<br>Screen |              | AES 22AB Out |
| 23<br>39<br>6  | Hot<br>Cold<br>Screen |              | AES 23AB Out |
| 5<br>22<br>38  | Hot<br>Cold<br>Screen |              | AES 24AB Out |
| 21<br>37<br>4  | Hot<br>Cold<br>Screen |              | AES 25AB Out |
| 3<br>20<br>36  | Hot<br>Cold<br>Screen |              | AES 26AB Out |
| 19<br>35<br>2  | Hot<br>Cold<br>Screen |              | AES 27AB Out |
| 1<br>18<br>34  | Hot<br>Cold<br>Screen |              | AES 28AB Out |

**Console General Purpose Interface (Console GPI)**

**AUX 2**

**Location:** Underside of Console  
**Mating connector:** 25-way D type male

**Connect cathode to GND to operate opto.**

| Opto | Console ID | Pin No. | Signal         |
|------|------------|---------|----------------|
| 1    | A          | 1       | Opto 1 cathode |
| 2    | B          | 2       | Opto 2 cathode |
| 3    | C          | 3       | Opto 3 cathode |
| 4    | D          | 4       | Opto 4 cathode |
| 5    | E          | 5       | Opto 5 cathode |
| 6    | F          | 6       | Opto 6 cathode |
| 7    | G          | 7       | Opto 7 cathode |
| 8    | H          | 8       | Opto 8 cathode |
|      |            | 13      | GND            |
|      |            | 25      | GND            |

### AUX 3

**Location:**  
**Mating connector:**  
**Contact rating:**

**Underside of Console**  
**25-way D type male**  
**1A at 50V DC**

| Relay | Console ID | Pin No.        | Signal             |
|-------|------------|----------------|--------------------|
| 1     | A          | 1<br>2<br>14   | NO<br>NC<br>COMMON |
| 2     | B          | 15<br>16<br>3  | NO<br>NC<br>COMMON |
| 3     | C          | 4<br>5<br>17   | NO<br>NC<br>COMMON |
| 4     | D          | 18<br>19<br>6  | NO<br>NC<br>COMMON |
| 5     | E          | 7<br>8<br>20   | NO<br>NC<br>COMMON |
| 6     | F          | 21<br>22<br>9  | NO<br>NC<br>COMMON |
| 7     | G          | 10<br>11<br>23 | NO<br>NC<br>COMMON |
| 8     | H          | 24<br>25<br>12 | NO<br>NC<br>COMMON |
|       |            | Chassis        | Screen             |