# ZETA 100

## TECHNICAL SALES DATA

## ISSUE 7

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

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

## CONTENTS

# Overview

## INTRODUCTION

The Zeta 100 is Calrec's third all digital production console designed for the most critical broadcast production and on-air applications. It is designed for use in television and radio production studios and outside broadcast vehicles where broadcast facilities cannot be compromised but space is restricted. Based on the well established Alpha 100 and Sigma 100 digital system architecture, Zeta 100 provides comprehensive features and functionality, with sophisticated failure protection systems.

The introduction of digitally controlled assignable systems in 1980 has allowed for their ergonomics to be continuously refined by user input and the Zeta 100 reflects this in its user interface. Fully assignable control means that any fader can control any channel or group. A dual layer design allows for single or dual path operation, and 2 Wild controls per fader allow allocation of assignable channel controls. The flexibility offered by digital control and a computer-aided memory system has been harnessed to provide greater functionality and ease of use. The console benefits from good operational visual feedback and a variety of metering options.

Zeta 100 is available in a number of cost-effective processing / input configurations and three frame sizes, with a variety of additional input and output interface options. These packages provide focused levels of technical provision at a reasonable cost, without sacrificing reliability, ergonomics or technical specification.

Calrec has a world-wide customer base which includes many of the world's most prestigious broadcasters. By consistently focusing upon purely broadcast products, Calrec offers consoles with the most comprehensive combination of performance and features available. The high level of reliability of all Calrec products, many of which are still in daily use after 20 years service, reflects a clear awareness of the critical nature of the operating environment.

This understanding of the real issues of broadcast operations is one of the many reasons why operators and management alike prefer Calrec. Zeta 100 is designed to ensure this level of confidence will continue in the digital era.


### ISO 9001 Registration

Calrec Audio Ltd has been issued the ISO9001: 2000 standard by the Governing Board of ISOQAR.

The award, for both UKAS and RAB registration, is the most comprehensive of the ISO9000 international standards. Granted in recognition of excellence across design, development, manufacture and after-sales support, the certification follows a rigorous and thorough review of Calrec's internal and external communication and business procedures.

## PRINCIPAL FEATURES

### Format

Up to 48 faders, with A & B layers of control, plus 2 Main Output faders.
88 equivalent Channels (up to 32 Stereo or Mono plus 24 Mono Channels), or:
96 equivalent channels (48 Stereo).
Table-top or floor stand mounting.
Comprehensive Surround Panning and Monitoring.

### Channel / Group Facilities

All channels have 4-band EQ/Filters, Compressor/Limiter and Expander/Gate.
All groups have Compressor/Limiter.
8 Mono or 4 Stereo Auxiliary Outputs.
Pre configured inserts are assignable to any channel or group.
Inserts can be pre or post fader.
All channels and groups have direct outputs.
Direct Outputs can be Pre EQ, Pre Fader or Post Fader.
Every Direct Output can be a Mix Minus feed.
Two assignable Wild controls per fader.
All faders are motorised.

### Routing

8 stereo or 8 mono Audio Groups, or 4 stereo and 4 mono Audio Groups.
Additional VCA style Grouping system.
16 outputs for multi-track or general purpose feeds.
Tracks can be fed from Pre EQ, Pre Fader, Post Fader or Direct Output.
Pan to Tracks.
Mono to Tracks on stereo channels and groups.
2 Main Stereo or 2 Main 5.1 Surround Outputs with Compressors/Limiters.
Simultaneous LCRS, Stereo and Mono outputs available from each 5.1 Main output.
Every channel can route to every bus, at the same time, without restrictions.
Direct Input available to Group, Mains, Aux and Mix-Minus busses.

### System

On board Flash ROM memory system offers 99 memories.
PC backup allows an unlimited number of memories.
Comprehensive GPI facility.
Desk operates independently of PC.
Independent DSP operation ensures audio continuity even during PC or control reset.
Console & racks boot from power on in less than 20 seconds.
Full control system reset in less than 15 seconds.
Last settings fully restored on power-up or re-set.
Automatic change over to hot spares for PSU’s, Control cards and DSP cards.
Hot plugging of every card and module.
Hot plugged cards initialise upon insertion.

## IMPORTANT CONCEPTS

### Layering

Each fader can control two independent audio signal paths, named A and B. These signal paths can be either channels or groups, although for easy reference the faders are simply known as “Channel Faders”.

B signal paths are fully equipped with all the same facilities as an A path.

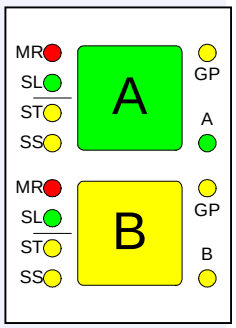
The faders are motorised, so when switching between A and B, the fader will move to the correct position.

This arrangement means there is less need for the operator to have to move around a large work-surface. Channels towards the ends of the control surface can be accessed more quickly than on a conventional, single layer design.

Less important signals can be placed on the B layer. Even then, only one button press is required to access them again. Using the ALL A and ALL B buttons is like moving to a different section of a single layer design.

The B layer does not need to be used if there are sufficient faders using just the A layer.

### Assignable Control




Each fader has an “Assign” button (sometimes called the “Show Me” button) for each audio path (A & B). Pressing this causes the central control modules (the “Assign Panels”) to display and control the settings for that fader’s channel or group path.

In this way a large number of controls can be accessed, for each audio path, from the central listening position. Also, accessing a control on a channel is usually faster using this method than on a conventional console.

A number of controls and displays are also provided on a per fader basis, to allow important information to be even more easily available.

In addition to the above, the type of audio path on each fader is completely assignable. The operator can choose which faders to use for the mono channels, which for the stereo channels, and which for the groups.

## PATHS AND PORTS

On an analogue desk, the channel inputs are physical connections to the channel module or card. They are fixed. Channel 1's input is always channel 1's input (even though it may be possible to control channel 1 from a different fader). Every channel will probably have both a Mic and a Line Input, even though most will only use one of them at any one time.

In a digital desk, there are two basic types of input: Mic/Line and Digital. However, it is not necessary to provide both types for every channel, as only one type will be used at any one time. To provide both for each channel would increase the cost, size and power consumption of the desk unnecessarily.

Instead, a "pool" of each type is provided, plus an internal matrix to allow any of them to be connected to any channel, giving much more flexibility than an analogue console. The matrix can be thought of as an electronic patch-bay with the added advantage that any connections made can be stored with the console's memories, and recalled at a later date. A similar matrix and "pool" is provided for the outputs. This is also stored with the memories.

Each channel can select from two inputs (1 & 2), switched on the Input Output panel. Both inputs can be set up independently, and can be any combination of Mic/Line and Digital. The two inputs have separate controls which include input gain, phase reverse and phantom power, etc. The switching between the two inputs takes place after these controls.

The basic terminology is that channels, groups and mains are referred to as "Paths" within the digital processing system, and the inputs and outputs are referred to as "Ports" through which the audio signals have to pass. Ports are connected to Paths via the Matrix.

All ports are optional, including those for the monitoring. The system can be supplied with any combination of Mic/Line and Digital ports. Calrec digital consoles are available in a number of configurations known as Audio Packs, which are a suggested complement of ports. The Audio Pack which most closely matches the requirements of the installation can be chosen, and the port quantities can be fine tuned appropriately.

## SIGNAL PATHS

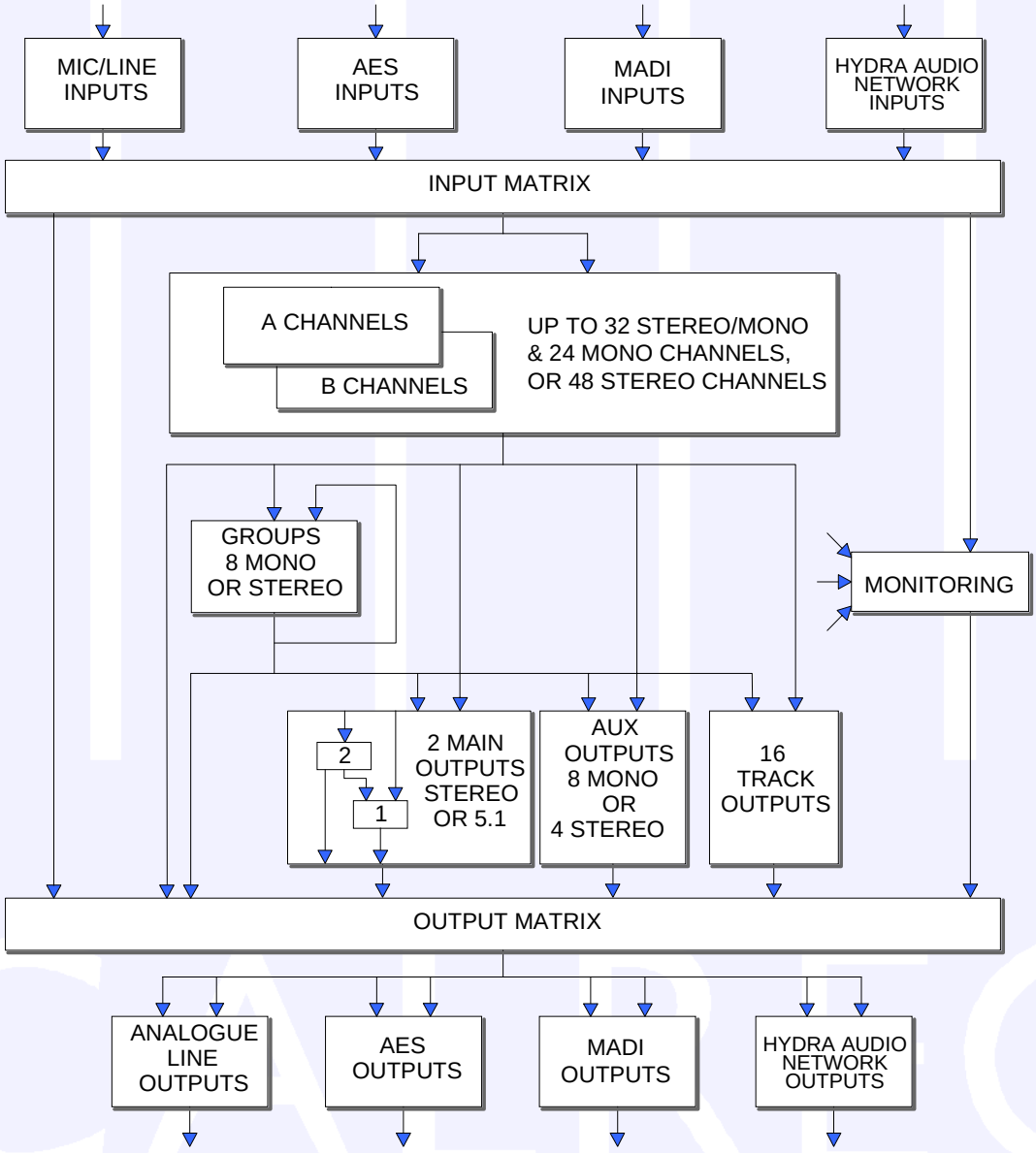
The Zeta 100 system can have up to 32 stereo or mono plus 24 mono channels, or 48 stereo channels.

The 8 groups can be designated as stereo or mono in blocks of 4. In addition, as many VCA style groups as required, can be created.

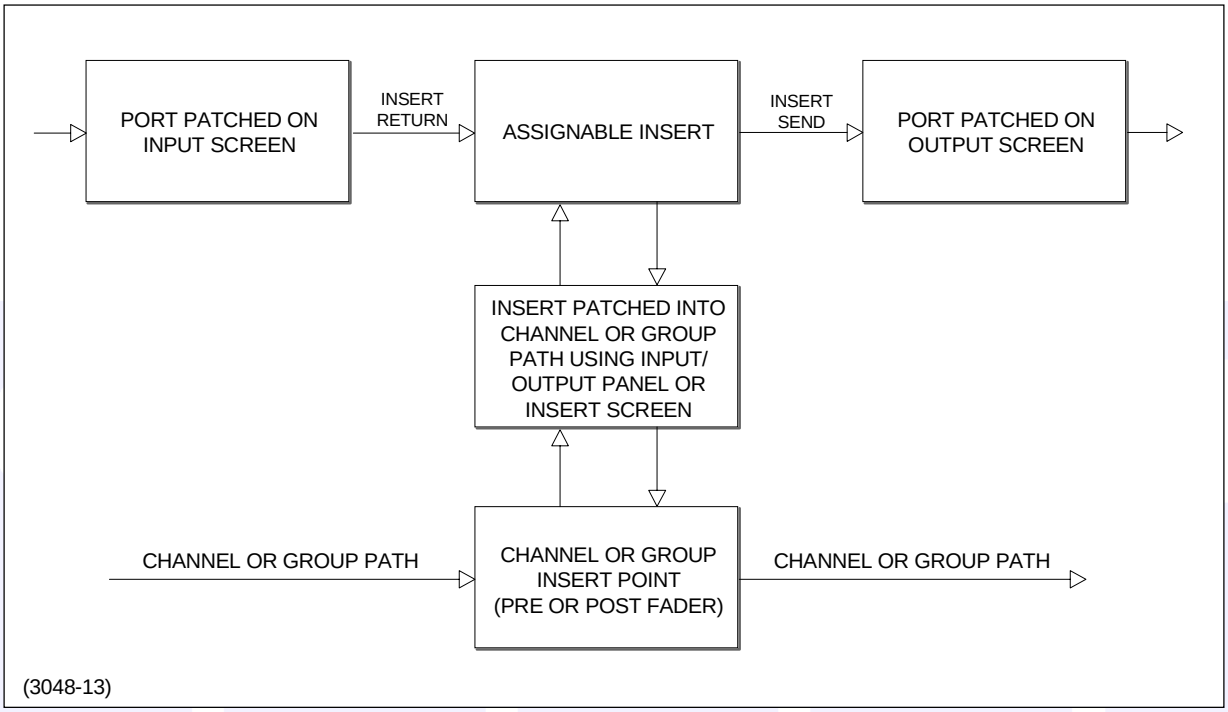
The 2 Main outputs can be designated either as both Stereo or both 5.1 Surround. If they are 5.1 Surround, then a mono rear is derived at the output to allow them to be used as LCRS mains. Stereo and Mono downmixes of the 5.1 are also produced.

If a channel is panned to both a stereo group and 5.1 bus simultaneously, the pan law to each will be correct, as though the other bus did not exist, even though the same control is used to achieve the pan.

The 8 Mono auxiliary outputs can be paired up to give up to 4 Stereo auxiliary outputs.



## ASSIGNABLE INSERTS



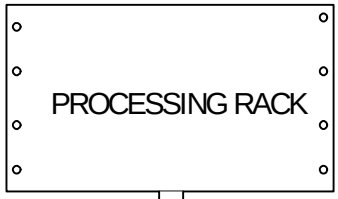

The system provides a pool of 48 assignable inserts which can be used in the stereo and mono channels and groups. In addition, the main outputs, because they can be surround, have their own dedicated inserts.

Assignable inserts are designed to be pre-connected to send and return ports which are in turn pre-wired to insertable devices or to an insert patchbay (normally there would be some of each type). The Input and Output screens allow Send and Return ports to be set up for the assignable inserts. They can then be patched into channels or groups as required, using either the INSERT screen or the port assignment controls on the Input/Output section of the control surface.

To facilitate the assignment of these inserts, the system allows the user to label them, in a similar way to how the Ports are labelled. The same rules also apply, including the exception that inserts dedicated to mono devices can be marked as such.

The assignable inserts can be divided into up to 4 lists. This allows inserts to be accessed more efficiently for selection on the port assignment controls on the Input/Output section of the control surface.

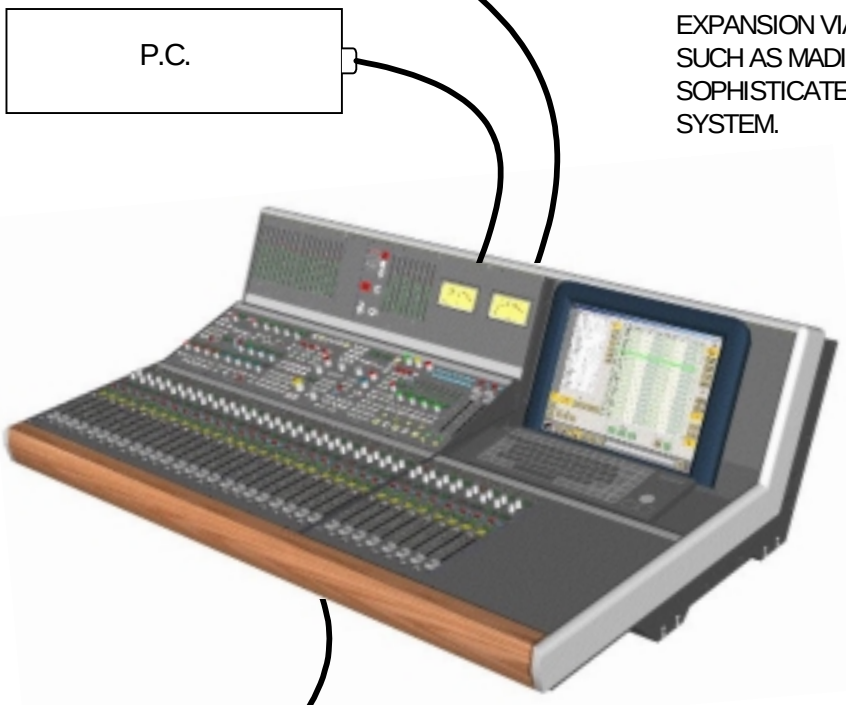
## INPUTS & OUTPUTS

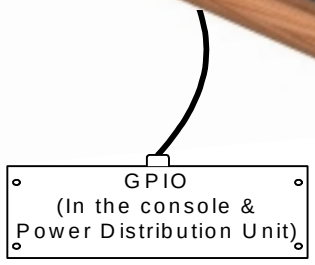



3 ANALOGUE INPUT CARD SLOTS
3 ANALOGUE OUTPUT CARD SLOTS
4 AES CARD SLOTS, 3 OF WHICH CAN HOUSE BULK CARDS *
2 CONTROL PROCESSOR SLOTS (1 PLUS HOT SPARE)
8 DSP CARD SLOTS (7 PLUS HOT SPARE)

- **ANALOGUE I/P CARD**- 32 INPUTS PER CARD.
- **ANALOGUE O/P CARD** - 32 OUTPUTS PER CARD.
- **AES CARD** - 32 AES INPUTS AND 32 AES OUTPUTS PER CARD.

* BULK CARDS ALLOW FOR OPTIONAL I/O EXPANSION VIA A WIDE AREA INTERFACE SUCH AS MADI OR "HYDRA" - CALREC'S SOPHISTICATED AUDIO NETWORKING SYSTEM.




A Zeta 100 system without I/O expansion has capability for:

- 96 Analogue inputs
- 96 Analogue outputs
- 128 AES inputs
- 128 AES outputs

## AUDIO PACKS

The Zeta 100 series is supplied in combinations of three basic processing cores (packs) providing pre-defined numbers of channels and I/O. Each of the three core provisions A, B and C 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.

### Provision A

Available Configurations:
**A1** - 56 equivalent channels: 8 mono and 24 stereo (4 groups)
**OR** **A2** - 60 equivalent channels: 30 stereo (4 groups)
**OR** **A3** - 48 equivalent channels: 8 mono and 20 stereo (8 groups)
**OR** **A4** - 52 equivalent channels: 26 stereo (8 groups)

Inputs/Outputs
32 Mono Mic/Line Input Ports
32 Mono Line Outputs
32 Stereo AES Inputs
32 Stereo AES Outputs

### Provision B

Available Configurations:
**B1** - 70 equivalent channels: 10 mono and 30 stereo (8 groups)
**OR** **B2** - 72 equivalent channels: 36 stereo (8 groups)

Inputs/Outputs
64 Mono Mic/Line Input Ports
64 Mono Line Outputs
32 Stereo AES Inputs
32 Stereo AES Outputs

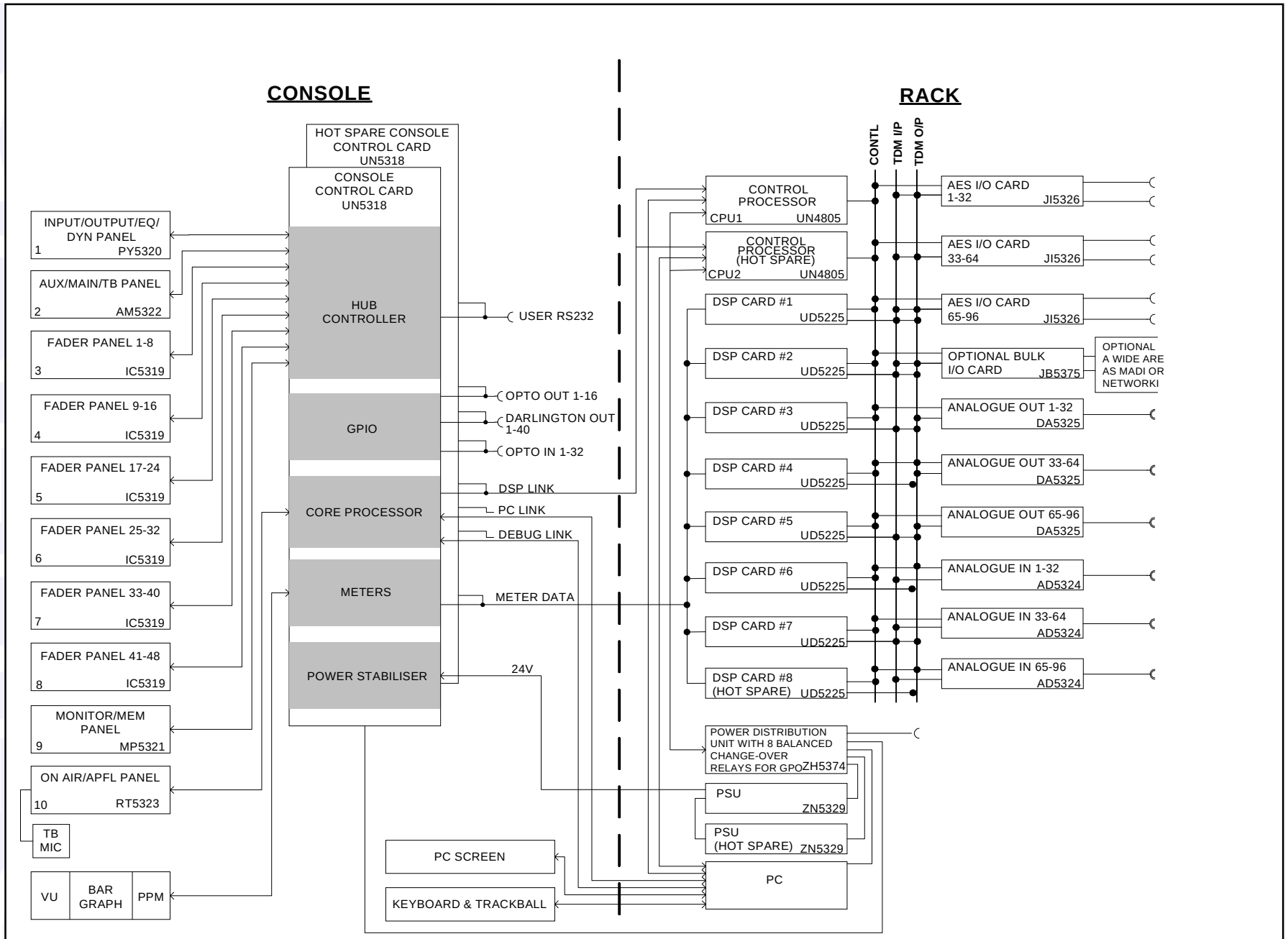
### Provision C

Available Configurations:
**C1** - 88 equivalent channels: 24 mono and 32 stereo (8 groups)
**OR** **C2** - 96 equivalent channels: 48 stereo (8 groups)

Inputs/Outputs
96 Mono Mic/Line Input Ports
96 Mono Line Outputs
64 Stereo AES Inputs
64 Stereo AES Outputs

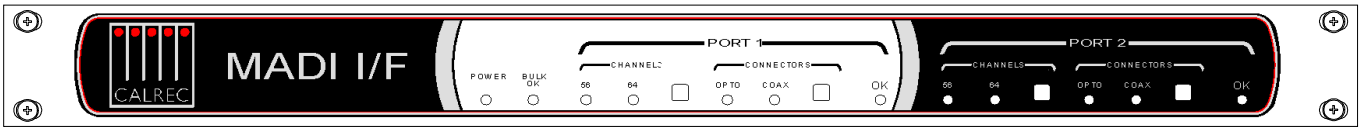
All desk output allocations must be derived from the above standard port provisions. However, they may be expanded by purchasing additional interface cards. If it is necessary to specify I/O interfaces which are less than a standard provision, this can be achieved by specifying a larger system and reducing the number of interfaces. It is not possible to reduce the processing provision in this instance.

# TYPICAL DIGITAL SYSTEM DIAGRAM



## OPTIONAL WIDE AREA INTERFACES

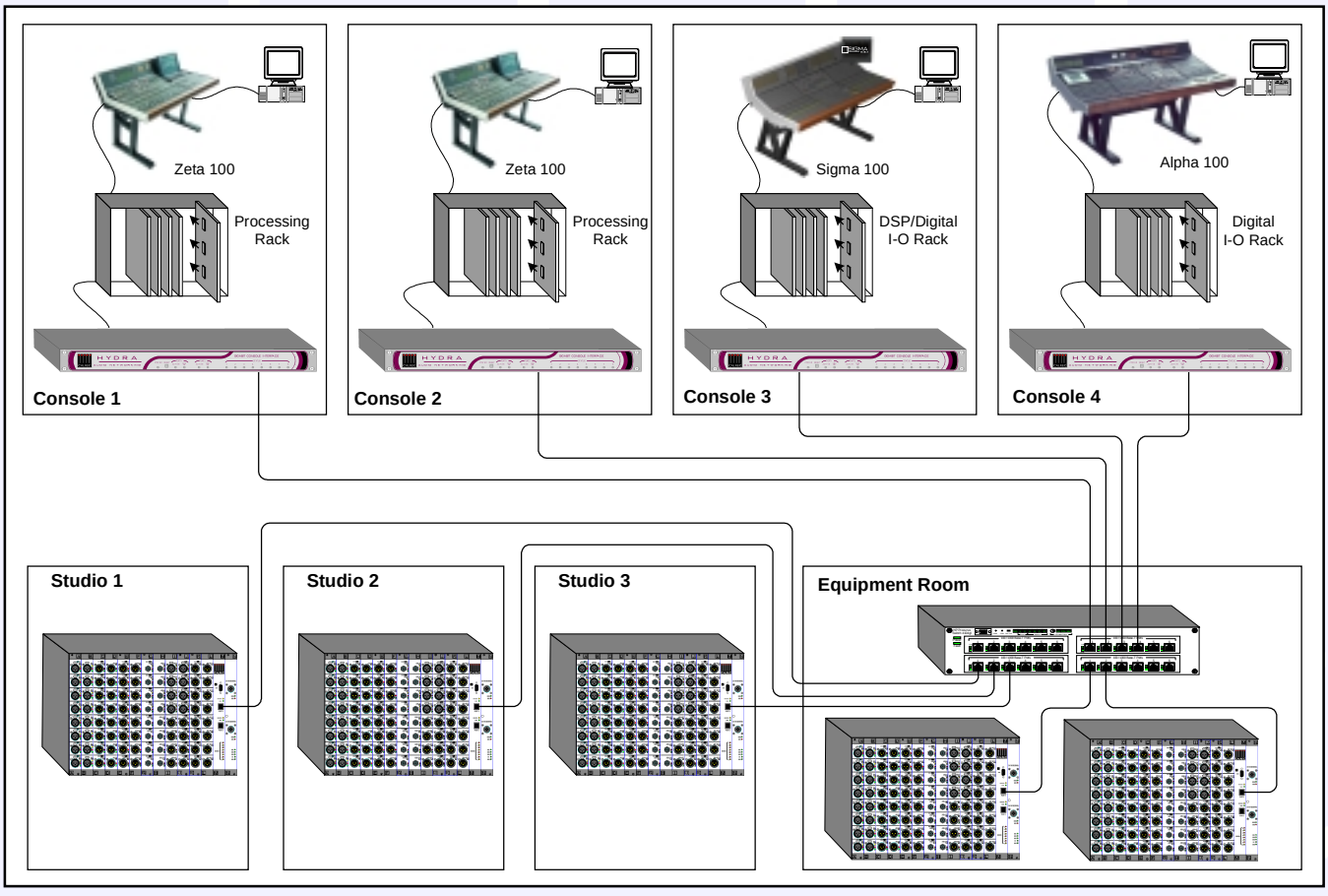
MADI




The rack mounted MADI Interface unit contains two independent, AES10 MADI compatible interfaces, and is available as an option. The two ports are interfaced to the Zeta 100 system via a Wide Area Bulk (WAB) card, which occupies one of the bulk card slots in the Processing 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. Sample Rate Conversion is not available on MADI inputs or outputs, therefore all equipment connected via MADI must be synchronised to the same source as the console.

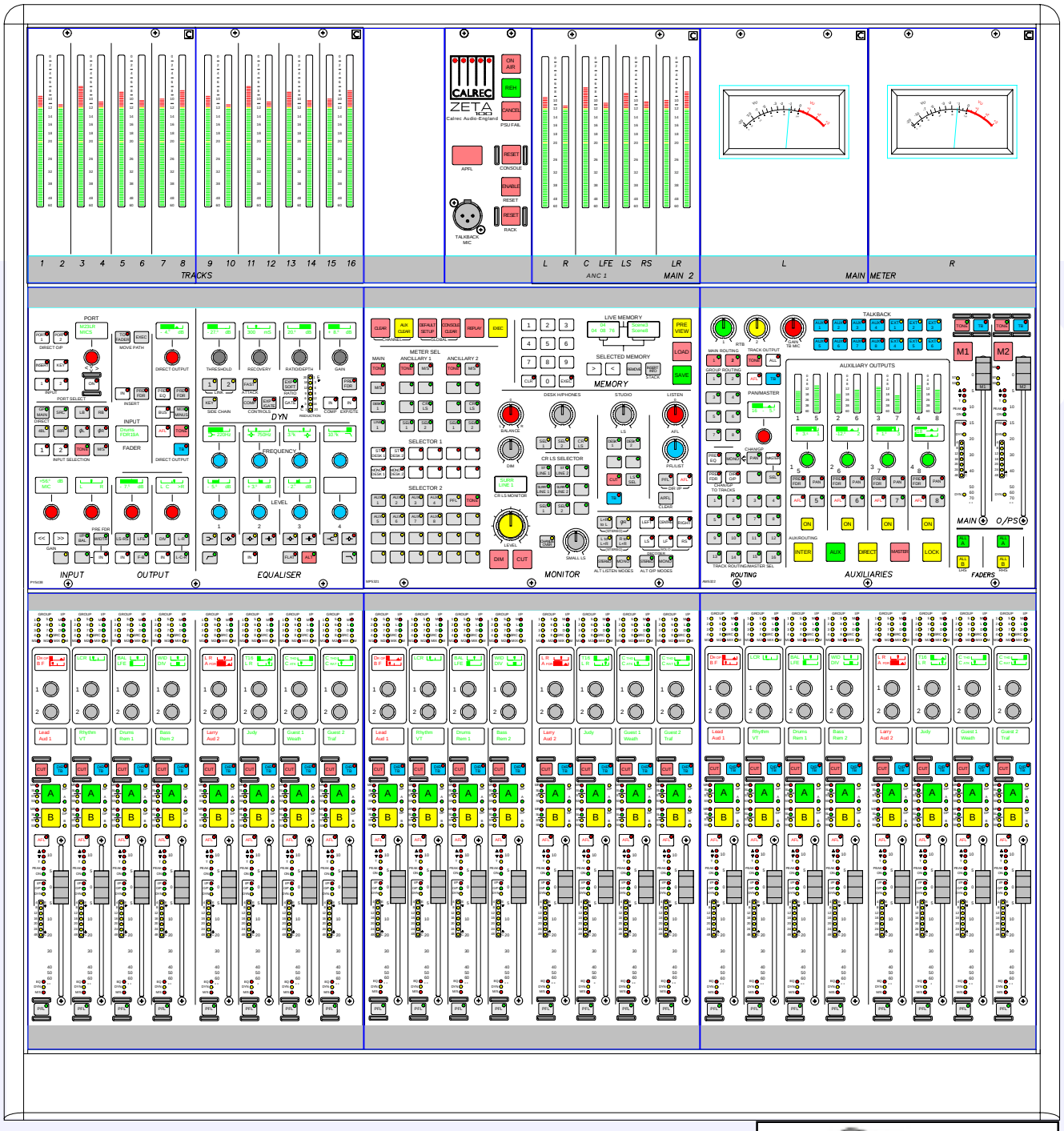
HYDRA


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. Gigabit ethernet fabric is used as it is by far the highest speed network fabric commonly available.



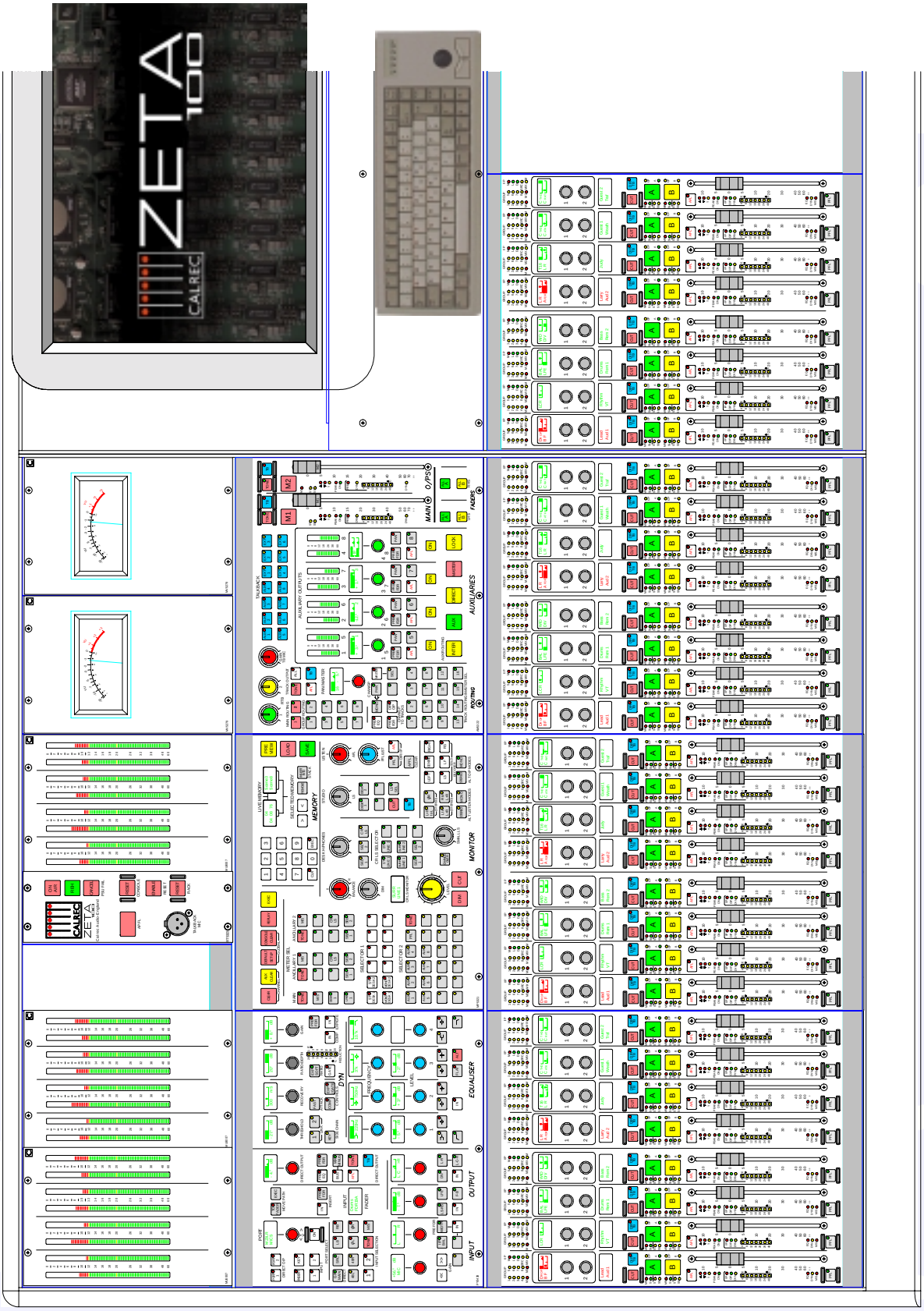
# Frame Options and Dimensions

## 24 FADER FRAME TYPICAL LAYOUT



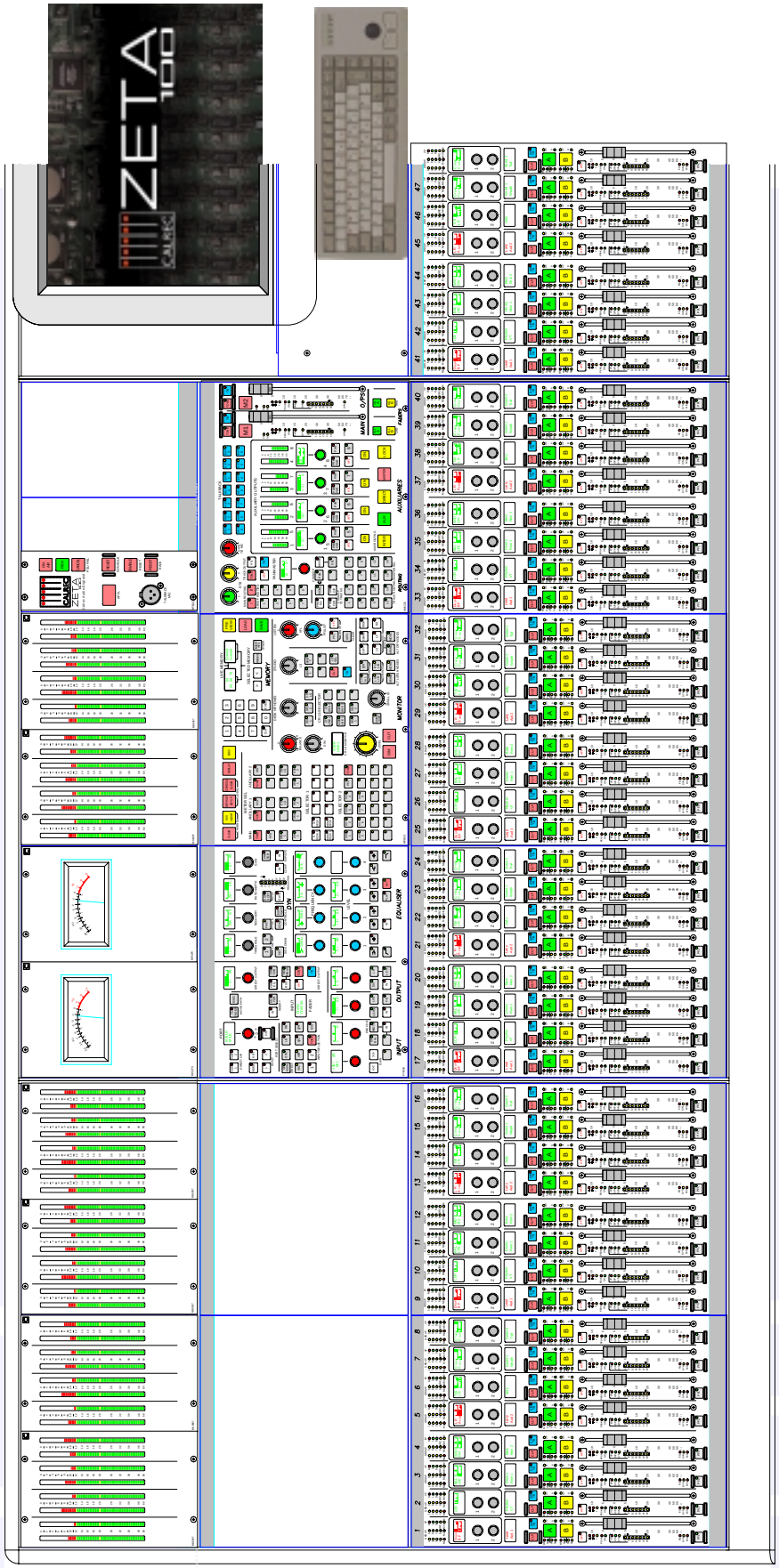

The smallest frame houses up to 24 faders, which allows up to 48 “Channel Faders” within a frame only 784mm (30.9 inches) wide. Due to it’s compact size, the colour touch screen, keyboard and trackerball need to be housed seperately.

## 32 FADER FRAME TYPICAL LAYOUT




The Medium sized frame houses up to 32 faders, which allows up to 64 “Channel Faders” within a frame only 1290mm (50.8 inches) wide.

## 48 FADER FRAME TYPICAL LAYOUT

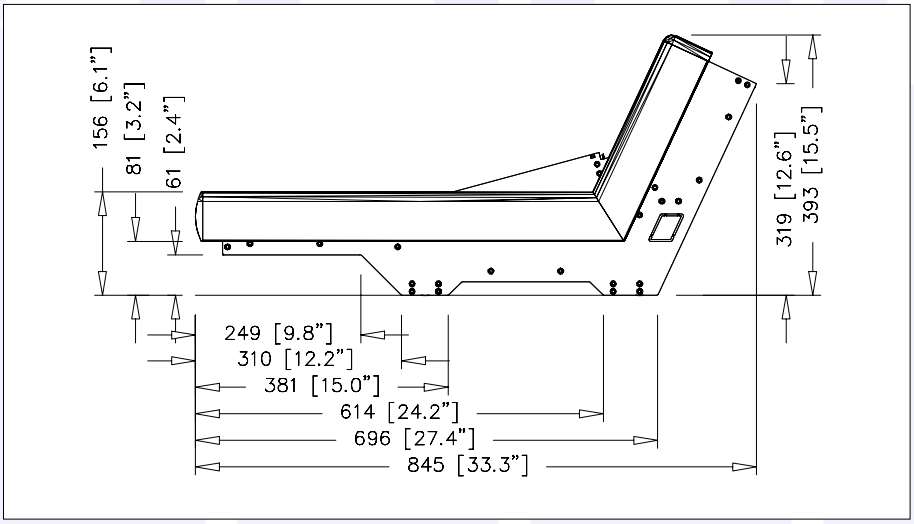


The largest frame houses up to 48 faders (the maximum number possible),, which allows up to 96 “Channel Faders” within a frame only 1796mm (70.7 inches) wide.

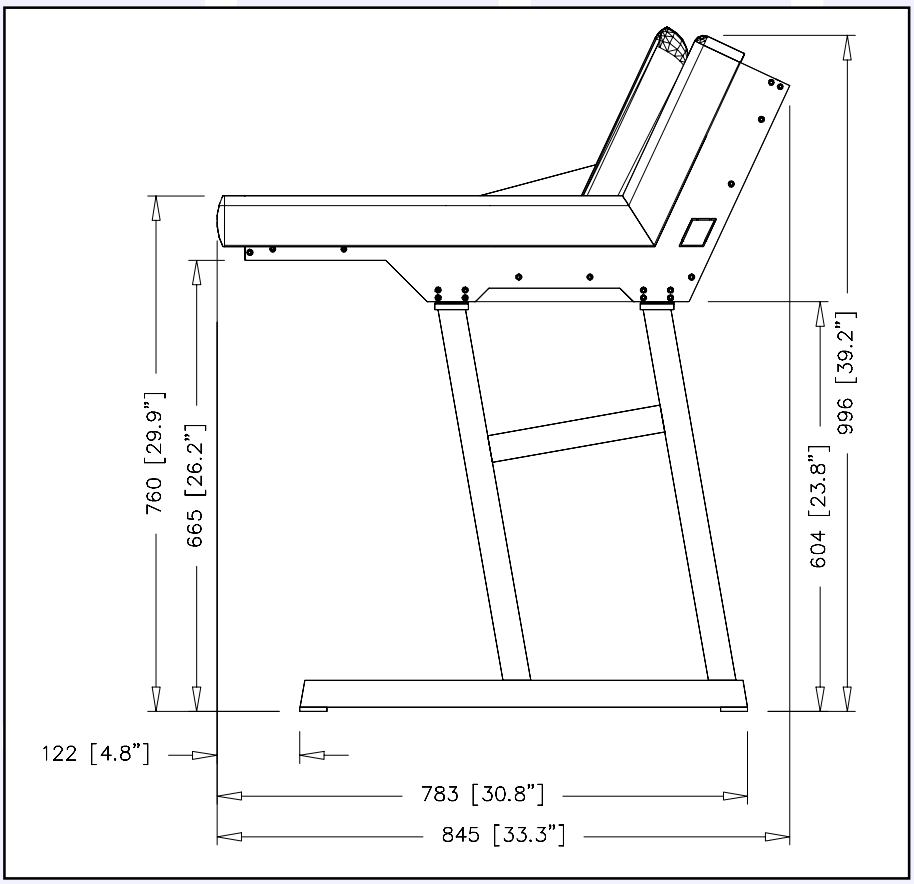
## CONSOLE PLAN DIMENSIONS

| Frame Size with average module population | 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 DIMENSIONS

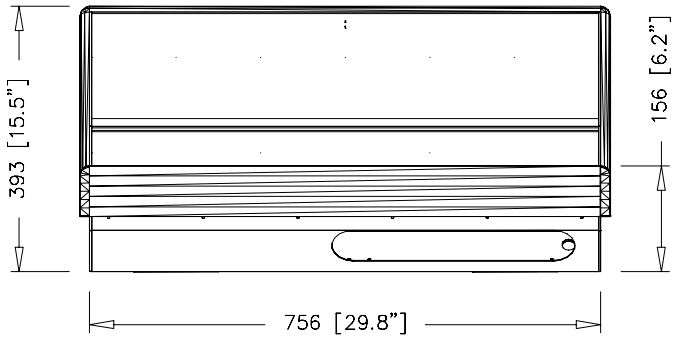



The end profile is the same for all three frame sizes.

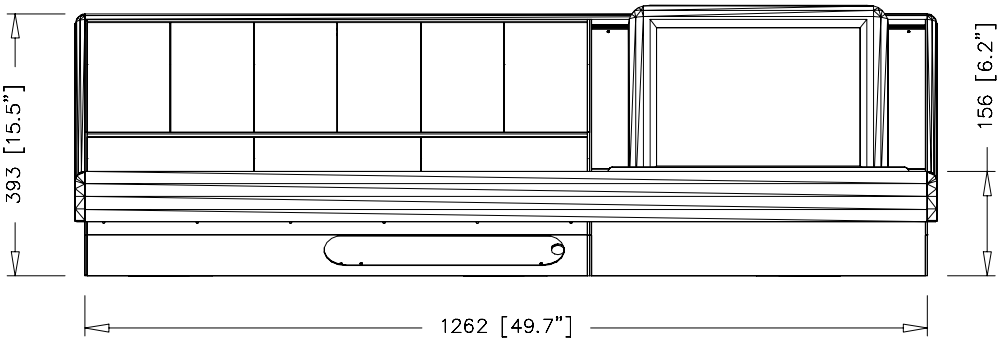



An optional floor stand is available.

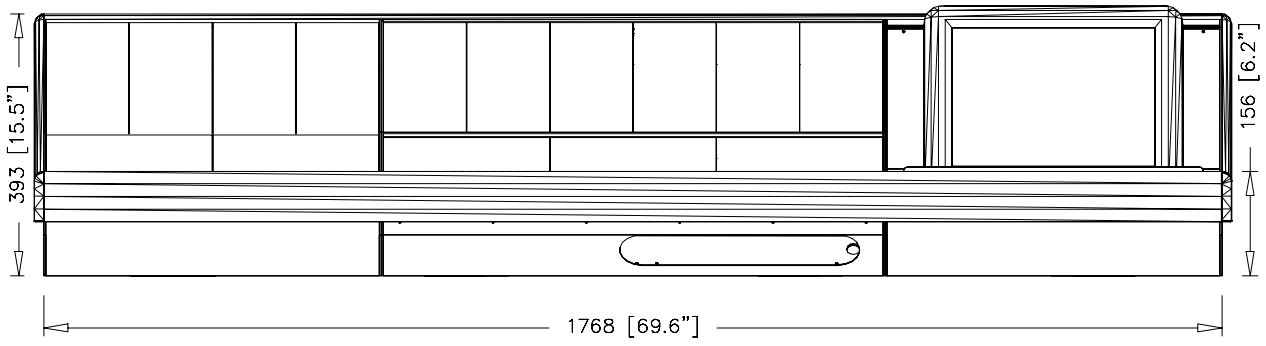
## FRONT ELEVATION DIMENSIONS




**24 FADER**




**32 FADER**

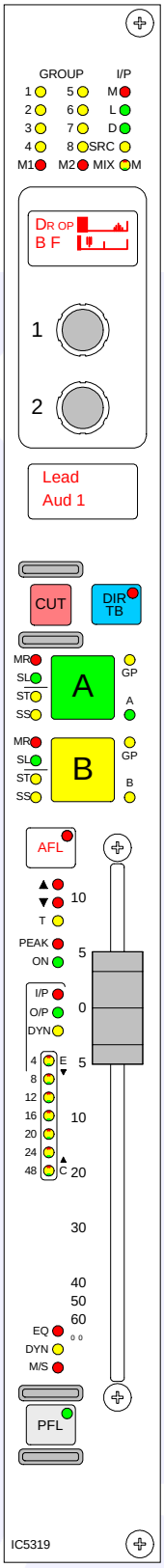



**48 FADER**

(3048-1/2/3)

# Control Surface

## "CHANNEL" FADERS




Channel and Group Paths are controlled by the console's "Channel" faders. Each fader can control two independent audio signal paths, named A and B. Any fader can control any channel or group path.

The A & B buttons are used to select either of the two channel paths A & B. Selecting a path will "call" the fader to the Assign Panels. Any changes made to the Assign Panels will affect the selected path only. When switching between the two paths, the indicative displays and fader position will change to match the settings of each path.

The label in the display is the name associated with the input assigned to the path, or the group number if the path is a group. The input labels default to the Port ID unless a name is entered via the PC. Path A's label is shown in the top half of the display, and path B's label is shown in the bottom half of the display. The colour of the display indicates the active path. If path A is active, the label will be green. If path B is active, the label will be amber. There are also A & B LEDs to the right of the A and B Assign buttons to indicate the active path.

The CUT button cuts the channel or group. Its effect is the same as fading out the channel or group. If preferrable, the CUT buttons can be replaced with ON buttons which switch the channel on.

Assign Button LEDs

| | | |
|---|---|---|
| MR | - | The fader path is a Master of a VCA style group. |
| SL | - | The fader path is a slave within a VCA style group. |
| GP | - | A Group is assigned to the path. |
| ST | - | The path is a stereo channel or group. |
| SS | - | Not Used. |

AFL will be heard through the monitor loudspeakers (main or small). AFL will be heard in surround provided that surround panning is in use to a surround main, and the loudspeaker system is surround.

PFL is provided on the fader overpress and on the button. It will be heard on the PFL LS or the Small LS, depending on how these are set in the Set-up application. PFL will be heard on the main LS if PFL to Mon is selected via the PC.

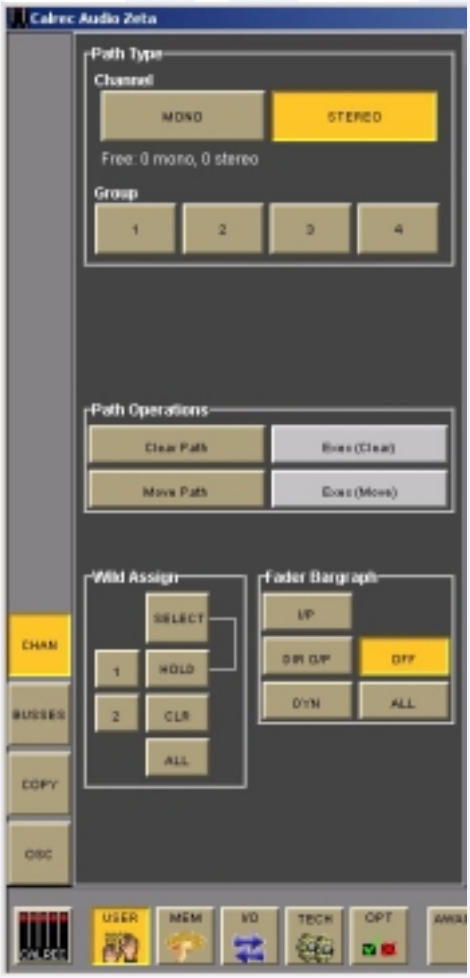
The fader bargraph can be set to display either the input level, Direct Output level or the amount of gain reduction being applied by the dynamics setting. This is selected using the USER-CHAN screen.

## "CHANNEL" CONTROL

The "Channel Control" section is situated directly above the channel fader section. A set of LED's provide indication of the channel's source type, routing and whether the direct output is feeding or being fed from mix-minus (or both). Two WILD controls per fader are available. Almost any Assign Panel rotary control for the selected path can be assigned to either Wild Control on the fader, including:

- Input Gain
- EQ
- Dynamics
- Pan and Balance
- Aux Send Level
- Direct Output Level
- Track Output Level
- Stereo Width
- Fader Level (opposite layer A or B)

## ASSIGNING WILD CONTROLS




The Wild controls are assigned from the USER-CHAN screen. All the Assign Panel rotary controls incorporate a switch which is operated by pushing the control. These switches are used to assign the control to a Wild control as follows:

1) Select a Fader Path by pressing its Assign Button (A or B).

2) Select WILD ASSIGN 1 or 2 on the USER-CHAN screen.

3) Push one Assign Panel rotary control. For example, Aux 1 Send.

The control is now assigned and changes will show in the display. The colour of the Wild control display will show which fader the control is related to: Green for A, Amber for B.

Clicking on the button above HOLD will toggle between SELECT mode and REGIONS mode, which allow controls to be assigned to more than one fader path at a time.

In SELECT mode, click HOLD, then a number of fader paths can be selected individually by pressing their fader assign buttons (A or B). Pushing an Assign Panel rotary control will assign that control to all selected faders.

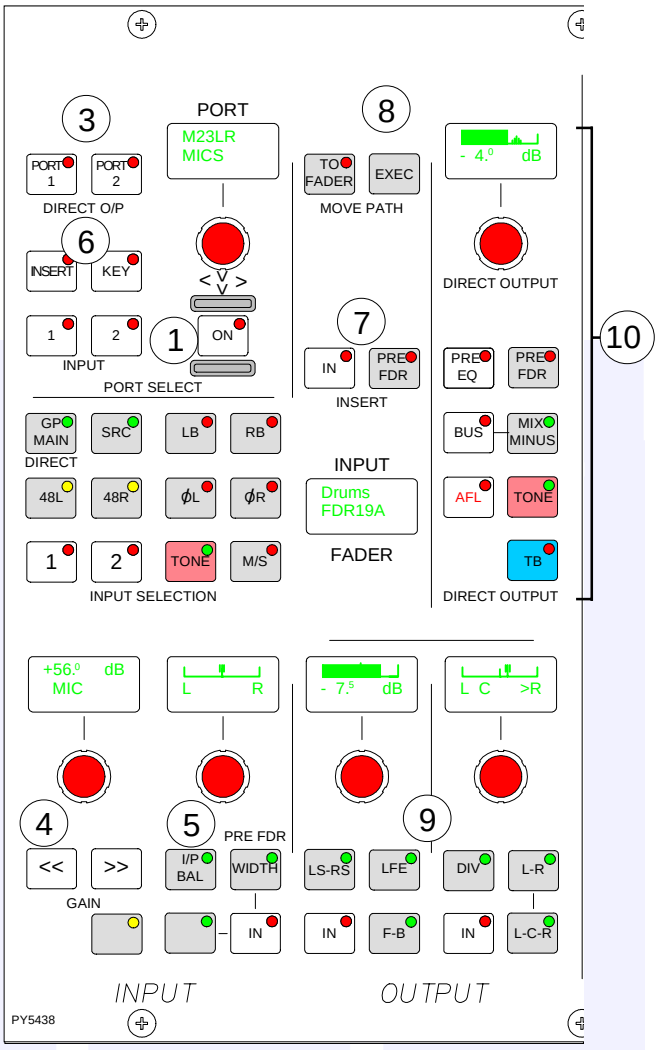
In REGIONS mode, a block or region of faders can be defined by clicking HOLD and then pressing the fader assign buttons of the first and last fader path in the required region. Pushing an Assign Panel rotary control will assign that control to all fader paths in the selected region.

It is possible to assign the same control to Wilds 1 or 2 for all fader paths by selecting ALL before pushing the required Assign Panel rotary control.

CLR will clear the selected Wild control from it's assignment.

## INPUT/OUTPUT CONTROLS

The INPUT controls in the Input/Output section allow separate settings for the two channel inputs, Port assignment and Gain, and On/Off for the Group & Main Direct Inputs.




### Input Port Assignment

(1) Each channel path has two inputs. Ports are patched to inputs 1 and 2 for the currently assigned fader as follows:

ν Press Port Select 1 or 2 to select an input.

ν Use the rotary control to scroll through the available input ports. The available inputs can be grouped into suitable lists at the time of installation. Pressing and turning the rotary control gives access to different lists of input ports. (Note: This does not switch the channel from input 1 to 2, or 2 to 1).

ν Press "ON" to assign the chosen input port.

ν De-selecting "ON" de-assigns the port, to allow a different one to be selected.

### Input Settings

(2) SRC switches the sample rate converter on AES inputs.

48L & 48R switch phantom power on Mic/line channel inputs. 48L is used for Mono channels.

LB & RB provide Left to Both & Right to Both on Stereo channels and groups.

M/S converts a sum & difference (mono/stereo) input to L & R on Stereo channels.

ØL and ØR buttons reverse the phase of the channel inputs. ØL is used for Mono channels.

The TONE button switches tone to the input of the channel or group, from where it can be routed as required.

(3) Two ports can be connected to Channel and Group Direct outputs. By selecting PORT1 or PORT2, the rotary control and ON button can be used to choose and select direct output ports.

(4) GAIN adjustment comprises 2 buttons for coarse ranging plus a knob for fine adjustment. Pressing both buttons at the same time sets the Gain to 0 dB. For a Group or Main Path, the controls set the gain of the Direct input. Gain is adjustable from -18dB to +78dB for Mic/line inputs, -18dB to +24dB for Digital inputs, and ∞ to +10dB for Direct inputs.

(5) The BALANCE control operates on Stereo channels only. When LB & RB are selected, the BALANCE control acts as an input pan control. A WIDTH control operates pre-fader, on Stereo channels and groups. It adjusts the width from mono, through stereo, to wide.

(6) Pressing the INSERT button allows the rotary control and ON button to control selection of assignable inserts on channels and groups.

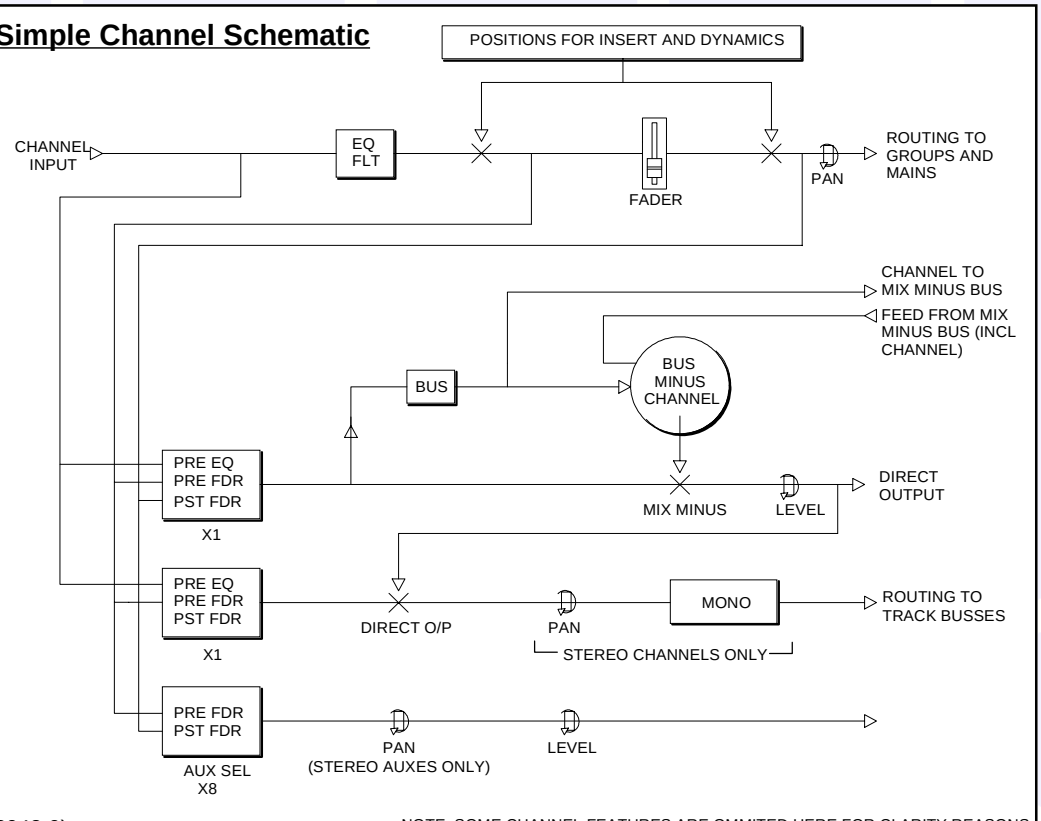
(7) Assignable inserts can be patched in and out of the channel path pre or post the channel fader, using the IN button. Assignable inserts must first be set up using the screens (see page 11).

(8) Paths can be moved or swapped from one fader to another, using the MOVE PATH buttons. Select the fader assign button that you want to move, and press TO FADER. Then select the destination fader assign button, and press EXEC. Paths can also be moved using the screens.

(9) Stereo and surround panning is provided for channels and groups. Signals can be panned to both stereo groups and 5.1 outputs simultaneously. AFL can be heard in surround, post the pan controls, if the main outputs and monitoring are surround.

(10) BUS feeds the Direct Output signal to the Mix Minus Bus. The output of the Mix Minus Bus feeds back into the channel where the channel's signal is subtracted. MIX MINUS then feeds the resulting signal to the Direct Output. Therefore, every channel can produce a Mix Minus output which is a mix of all the channels routed to the bus apart from itself. MIX MINUS & BUS are independent buttons, so the Track routing selector and the direct output can be fed with the Mix Minus Bus, even if the channel is not feeding the bus. Groups can also produce a mix-minus output in the same way.

**Simple Channel Schematic**

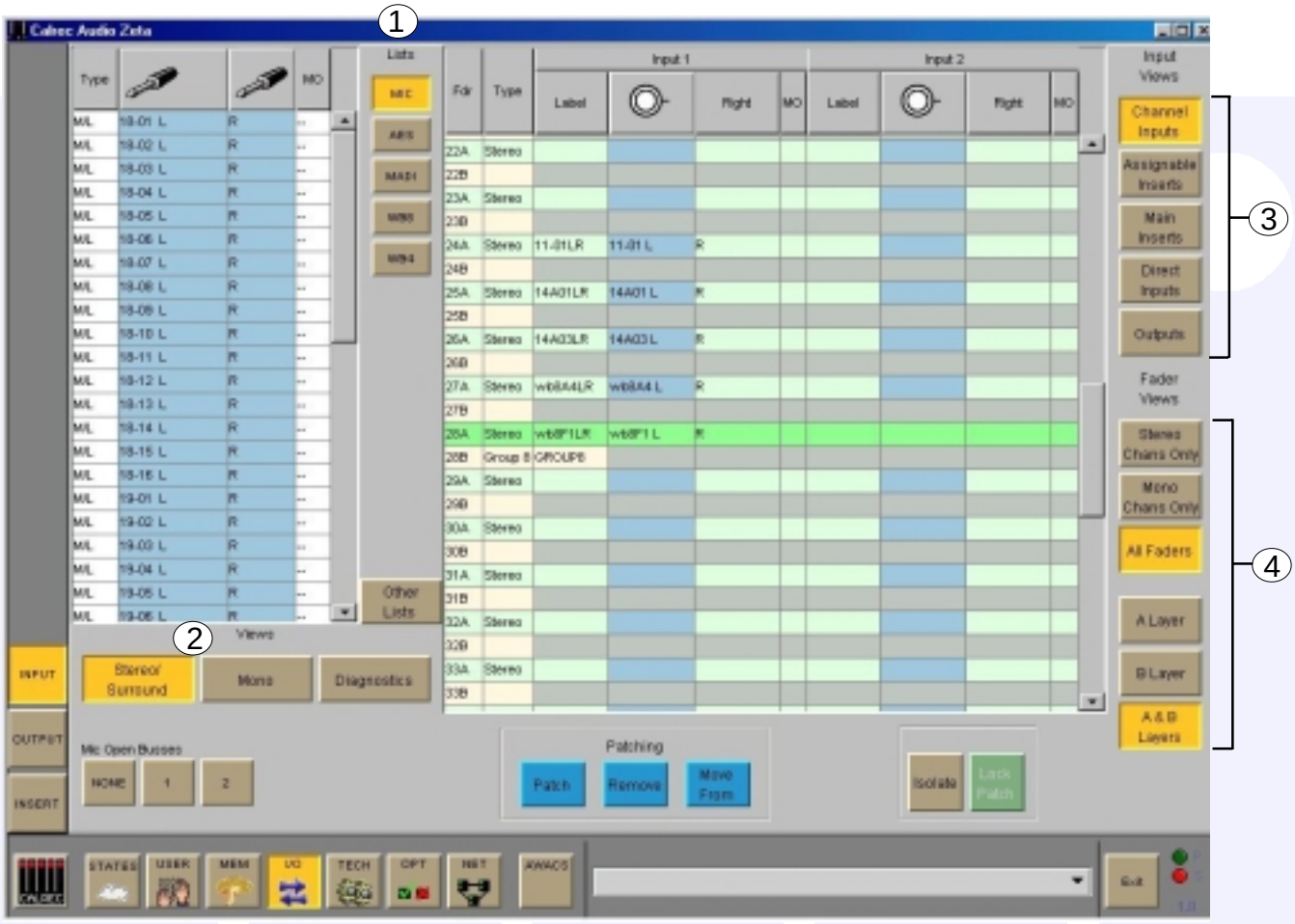



(3048-9)

NOTE: SOME CHANNEL FEATURES ARE OMMITED HERE FOR CLARITY REASONS.

## INPUT PORTS SCREEN


In addition to the port and insert connection controls in the Input-Output section of the control surface, port connections for all I-O and the assignment of inserts can be set using the PC. The screen below is the Input Ports Screen and is used for “patching” input sources to channel inputs, insert returns, direct inputs or port outputs. The screens automatically scroll to follow the Assign button (A and B) presses on the faders.




Assignment is made by selecting a source,  and an input or output,  and selecting Patch. 

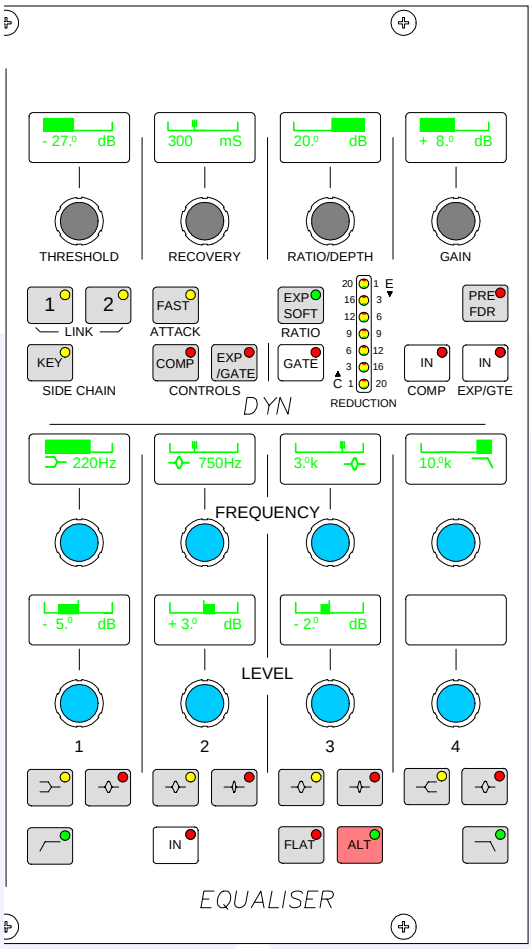

(1) All of the available input ports can be grouped into suitable lists at the time of installation. These lists can then be displayed on the left of this screen, ready to be patched to channels. Different lists are accessed using the selection buttons.

(2) The sources can be viewed as pairs (best for patching to stereo or surround paths), individual (best for patching to mono paths), or individual with the actual rack number, card slot and input shown (for diagnostic purposes).

(3) These buttons select the different console path types which can have input ports attached - channel inputs, insert returns, direct inputs or port outputs. They will then be displayed in the main section of this screen. Selecting a source from the source list and a channel, insert return, direct input or output port, then selecting PATCH will assign that source.

(4) It is possible to choose which set of faders are to be available on and altered by this screen.

## DYNAMICS, EQ & FILTERS




The Dynamics section of the module controls the side chain, providing a Compressor/Limiter and Expander/Gate on channels, and a Compressor/Limiter on groups and main outputs

The COMP and EXP/GATE buttons switch the controls between the two functions. The IN buttons switch the Compressor/Limiter and Expander/Gate into the signal's path. The controls provide:

**For a Compressor/Limiter:**

Threshold +20dB to -20dB
Recovery 75ms to 4 sec + AUTO (Max anti-clockwise setting)
Ratio 1 to 50 (Limiter)
Fast Attack = 250µs (normal 5ms)

Make up gain between 0dB to +20dB can be applied.

**For an Expander:**

Threshold 0dB to -40dB
Recovery 75ms to 4 sec + AUTO (Max anti-clockwise setting)
Depth 0dB to 40dB
Fast attack 300µs (normal 16ms)
Ratio 2/1 or SOFT

**For a Gate:**

Threshold 0dB to -40dB
Recovery 75ms to 4 sec + AUTO (Max anti-clockwise setting)
Depth 0dB to 40dB
Fast attack 300µs (normal 16ms)

It is possible to have the dynamics of many channels linked by assigning them to one of two available link busses. This is useful for when the same dynamics settings need to be applied to more than one channel, for example, when four channels represent a 5.1 signal. With the channel selected, press 1or 2 to assign the channel to the bus.

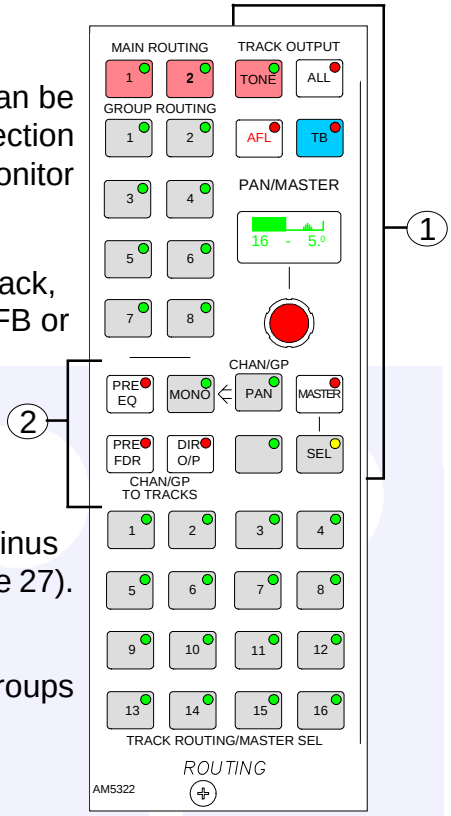
**EQ & Filters:**

The controls provide:

**1** 20Hz to 470Hz, shelf, bell (Q of 1) or High Pass Filter (12 dB/octave).
**2** 50Hz to 3.2kHz, Q = 1 or High Q = 3.
**3** 250Hz to 16kHz, Q = 1 or High Q = 3.
**4** 1kHz to 20kHz, shelf or bell (Q of 1) or Low Pass Filter (12 dB/octave).

Bands overlap to allow greater flexibility of settings. EQ level controls are adjustable by +/-15dB.

## ROUTING



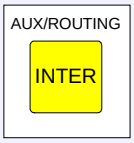

Routes to tracks, groups or main outputs for the selected channel can be made or removed by pressing the numbered buttons in the routing section of this panel. 8 optional bargraphs can be fitted in the upstand to monitor the group levels.

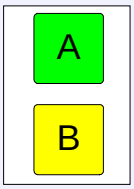
(1) The TRACK OUTPUT section controls the output to the multi-track, after the track mix. The 16 track outputs can also be used as IFB or general purpose bus outputs. 16 optional bargraphs can be fitted in the upstand to monitor the output level.

(2) The CHANNEL/GP TO TRACKS section selects the signal feeding the track routing selector to be post-fader (All OFF), pre-EQ, pre-fader or a copy of the direct output (post the mix minus and direct output level controls - see Channel Schematic on page 27).

Pan (Balance on stereo channels and groups) pans the signal between odd and even tracks. Mono (on stereo channels and groups only) makes the signal mono after the pan.

### Interrogate Mode

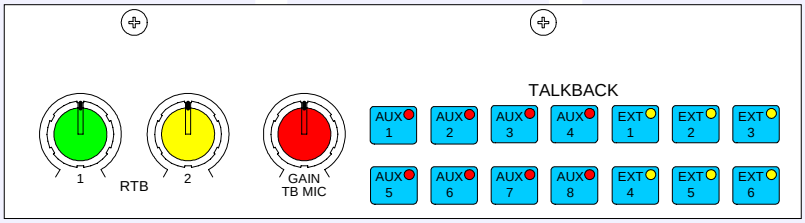



It is possible to discover which fader paths are feeding each of the routing busses by putting the panel into “Interrogate” mode. This is done by pressing the INTER button in the Auxiliaries section. If any of the routing buttons (Groups, Mains, Tracks) buttons are held down, the fader assign buttons of all the paths feeding that bus will light. Auxiliary and Mix minus busses can also be interrogated in this way.

When in Interrogate mode, it is possible to add or remove paths to and from the bus under interrogation. With the required routing button held down, simply select or de-select the path by pressing it’s fader assign button. This is known as “Reverse Routing”.

## TALKBACK



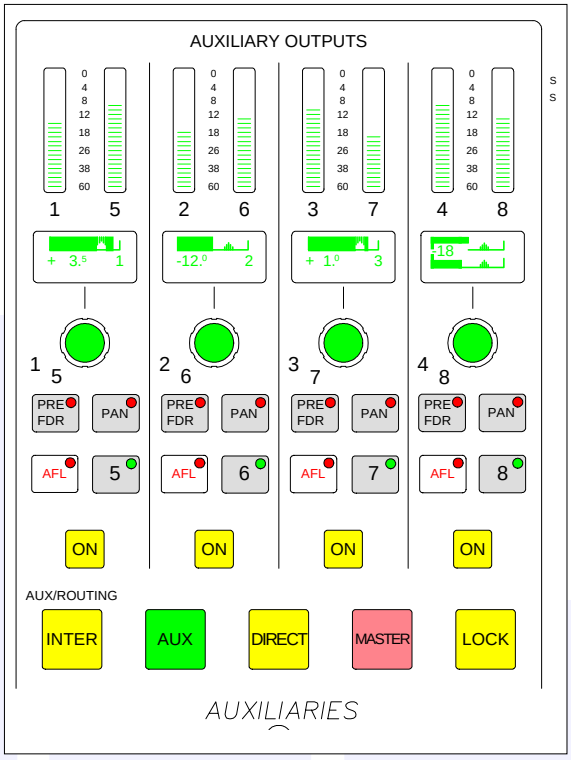

Talkback is available to all 8 Auxes and 6 externals (via GPO switching) using the buttons in this section . Talkback is also available using the buttons on the fader modules, the Input/Output section and the Track output section, to Direct Outputs and individual tracks. Talkback is available to Studio LS using the button in the monitor selector section.

All Talkback buttons are subject to On-Air inhibits, set up via the PC.

The GAIN control sets the level of the TB Mic.

2 rotary controls set the level of 2 RTB (Reverse Talkback) signals.

## AUXILIARIES




There can be 8 mono or 4 stereo Auxiliaries. The Auxilliary buses are pre-set to be mono or stereo using the screens. If, for example, aux 4 is set to be stereo, then aux 8 will not be available (and Aux 8 will not work on the monitor selector).

On mono auxiliaries, buttons 5 to 8 switch the control to that numbered aux send.

The **ON** buttons switch the feed to the Aux on. Each feed can be pre or post the channel or group fader.

The bargraphs at the top of the panel display the Aux output levels.

**PAN** makes the control into a Pan control (balance on stereo channels) if the Aux is stereo. Any pan offset will be shown as an offset between the two bars of the display when controlling the level.

INTER — This latching button puts the panel into Interrogate mode. If the Aux ON buttons are held down, the fader assign buttons of all the paths feeding that bus will light. It is also possible for interrogation of the routing busses to take place by holding down any of the routing buttons (Groups, Mains, Tracks).

**AUX, DIRECT, MASTER** and **LOCK** influence the function of the controls.

AUX — When AUX is selected, this section of the module controls the feeds from the channels or groups to the auxiliary output busses.

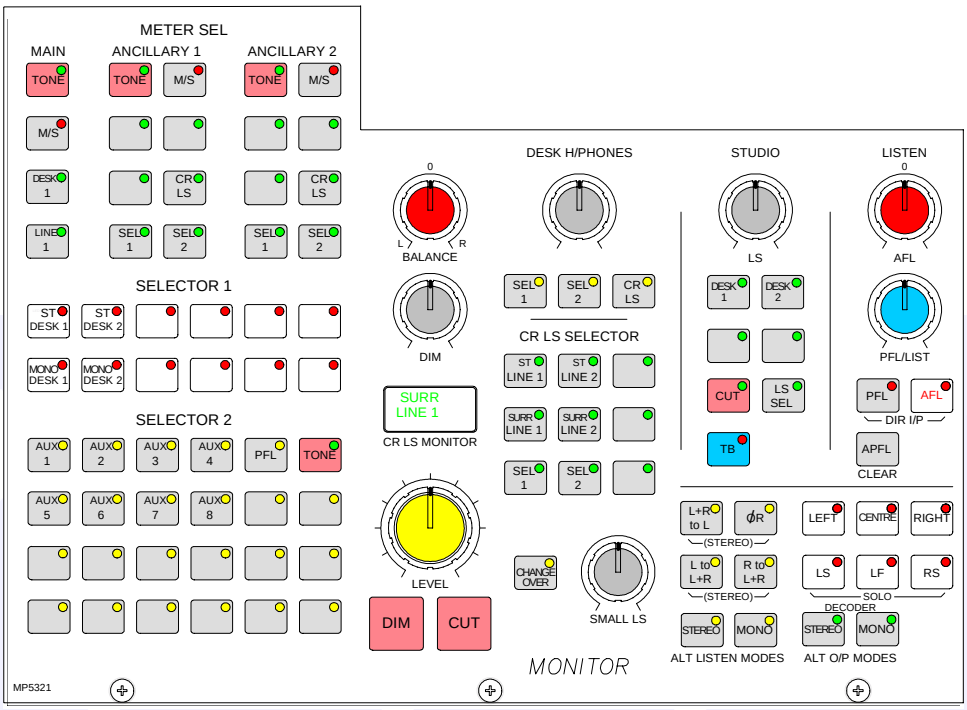
DIRECT — When DIRECT is selected, this section controls the aux direct inputs. The pre fader and pan controls will be in-operative.

MASTER — When MASTER is selected this section controls the aux outputs. On stereo auxiliaries a dual level display will be shown. There cannot be a level offset on the output display. The ON buttons switch the output on and off.

LOCK — Locks the panel into MASTER mode. If LOCK is not selected, the panel reverts to AUX mode if a fader assign button is pressed.

When DIRECT or MASTER are selected, the displays above each rotary control show a bargraph of the gain, and what is being controlled (e.g O/P or DIR) . This remains until they are adjusted, when the dB value of the gain is then displayed. A short time after the adjustment has been made, the display will show the bar and label again.

## MONITOR SELECTOR & LS




The Monitor Selector is used to select the source to monitor, and the Meter Selector is used to select what to display on the meters. If the loudspeaker system is surround, stereo and mono sources will still be heard in stereo and mono, with no signals on the other speakers. Selector 1 & Selector 2 are sub-selectors which feed the other selectors. All selector external inputs can be mono, stereo or 5.1. Mono inputs are fed to L + R.

For surround signals to be monitored using stereo loudspeakers or metering, a stereo downmix is created in the monitoring. If a main output is surround, the stereo monitor buttons for that main output will monitor the stereo (downmix) output of that main output. The surround monitor buttons for a stereo main output will be disabled.

The Small LS level control is in series with the Main LS level control. The “change over” button diverts the monitor output to the Small LS for near field, or domestic check monitoring. Both Main and Small LS can be Stereo, 3 Stereo, or 5.1 independently.

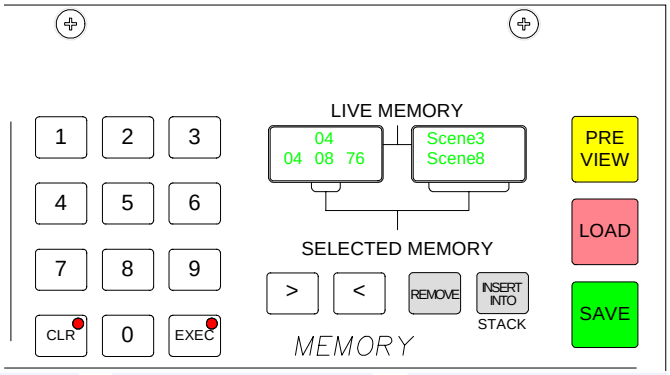
DIM, CUT & SOLO operate on both sets of loudspeakers. DIM & CUT can be externally operated and controlled from the TB.

ALTERNATIVE LISTENING MODES: All off indicates NORMAL (Mono, Stereo or Surround depending on the source selected and the LS arrangement). ØR, L+R to L, L to L+R, and R to L+R will work in any mode, but are really designed for use in STEREO mode or when monitoring stereo sources. MONO feeds L, C, R, LS & RS to L + R.

AFL (post the surround panning controls) feeds the Control Room LS outputs , overriding the LS SEL. PFL is available on Selector 2, or alternatively, there can be a separate stereo PFL LS output. An external RTB input can mix with PFL to the PFL LS output. APFL CLEAR, clears any latched buttons.

## MEMORY SECTION

99 memories can be held in the Flash ROM for different console arrangements. In addition to this, the PC back-up can allow an unlimited number of memories, which can be restored into the Flash ROM as required. Memories can also be stored to external media, which can be useful for when several operators use the same console.

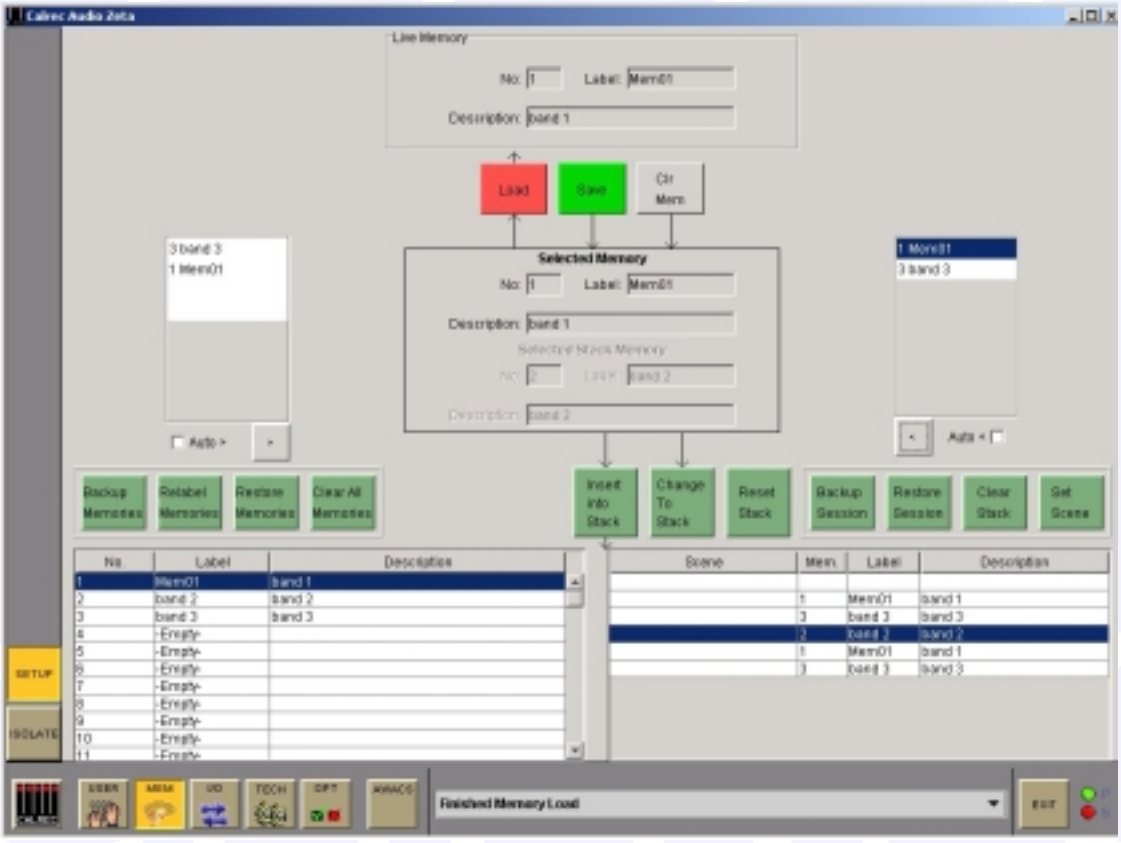



The Live Memory is the last memory loaded onto the console. The buttons in the memory section act on the Selected Memory. The Selected Memory can be thought of as the “Ready” position, where the operator can place the next required memory until it is needed.

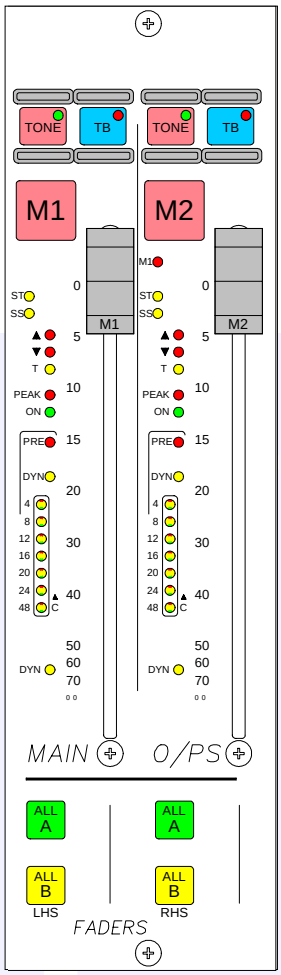
Pressing LOAD+EXEC will launch the Selected Memory into the Live Memory position, overriding the current console settings.

The Selected Memory can be chosen either using the keypad to type in the required memory’s number, or by clicking on the required memory in the Flash Rom list on the left of the Memories Screen.

The memories can be arranged into a Pre-set list, known as a STACK. This can be useful for setting up an easy-to-access shortlist of specific memories for use during a show. To add a memory to the stack, ensure it is in the Selected Memory position, and select INSERT INTO STACK either on the control surface or the screen.



## MAIN OUTPUTS




Unlike channel faders, the main fader design is not dual path.

The ASSIGN buttons (M1, M2) call Main Output 1 or 2 to the Assign Panels to allow:

- Routing of one Main to another.
- Insert ON/OFF.
- Control of the Compressor and Direct Input.

The Main outputs can be pre-set to be either Surround or Stereo. Surround Mains are 5.1 plus a Rear downmix to allow a simultaneous LCRS. There is also a Stereo downmix and a Mono downmix (potentially 10 outputs for each Surround Main). The Insert and Direct Input are also Surround.

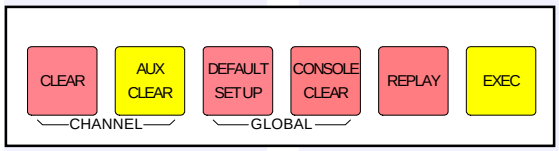
The Main Output Meters display the stereo downmix if the output is surround. If the Main Line Monitor is set to be fed back from the Studio Distribution via external inputs to the desk, then the meters will display this instead.

The function of the fader bargraph can be set to display either the pre fader level or the amount of gain reduction applied by the Dynamics setting.

### Faders Section

The ALL A and ALL B buttons switch all the channel faders to display either their A path or their B path. Using the ALL A and ALL B buttons is like moving to a different section of a single layer design.

Console Functions



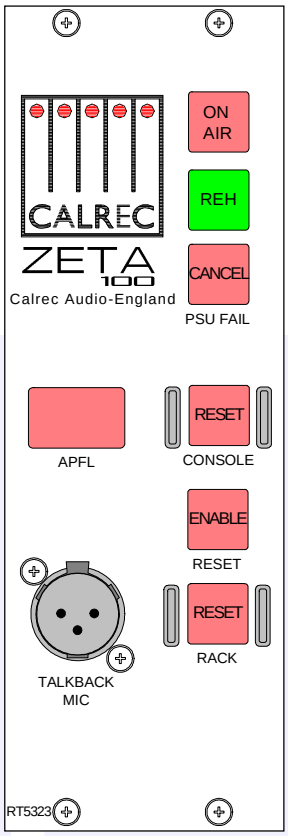

These buttons are located above the Meter Selector controls. The channel buttons allow clearing of all settings, or just the Auxiliary settings from the currently assigned channel path. The global buttons allow the default studio set-up to be loaded onto the console, or for all console settings to be cleared completely.

CLEAR, AUX CLEAR, DEFAULT SET-UP and CONSOLE CLEAR flash when pressed and require EXEC to be pressed before the operation is carried out. It is recommended that settings are saved to memory before these functions are used.

### Default Set-up

The Default set-up will usually be created upon installation of the Zeta 100. This is a default memory, which could contain the fixed port set-ups which match the studio wiring, and any other settings which hardly ever change. It could have all channel settings OFF or flat, with no routes made, and would be available as a start up memory, from which more specific memories could be created.

## RESET PANEL AND ERROR CORRECTION




This module controls the Transmit/Rehearse state of the console; allows rack and console reset, and houses the connector for the Talkback microphone.

### Condition Switching

There are three modes which the system can be in: Transmit (TX or On Air), Rehearse, or neither. These are controlled from the ON AIR and REH buttons at the top of this module. The condition switching for the system is set up using the screens, where many different functions can be set to be active, or not, in any of the three states. This can significantly reduce the risk of human error when in the various modes, making the whole system a more robust, less stressful, user friendly environment for operators to work in.

### Power Supply Monitoring

The rack mounted PSU monitor module monitors the power supplies for failures, and ensures "hot" changeover to the spare should a fault develop (if the hot spare option has been purchased). The PSU FAIL Indicator/Cancel button on this panel will flash if any one PSU fails (the hot spare PSU would prevent the desk from being affected). Pressing this button will change the flashing to a steady lit condition. In this mode, in the unlikely event of a second PSU failing, the light will begin to flash again, although depending on the function affected by this second failure, other effects may be apparent.

### AWACS


If a problem does develop, messages will be delivered on the Automatic Warning and Correction System (AWACS) screen. The AWACS button at the bottom of the screen will flash to alert the user that a message has been reported. Selection of this button will open the AWACS page, where messages can be viewed. Selecting a message will reveal a more detailed description. Message history is saved to the PC's hard disk for future analysis.

Because the system has many back-up features, it is possible to continue operating after errors are reported. If un-cleared errors are still present, an icon will flash in the AWACS button.

### Console and Rack Reset

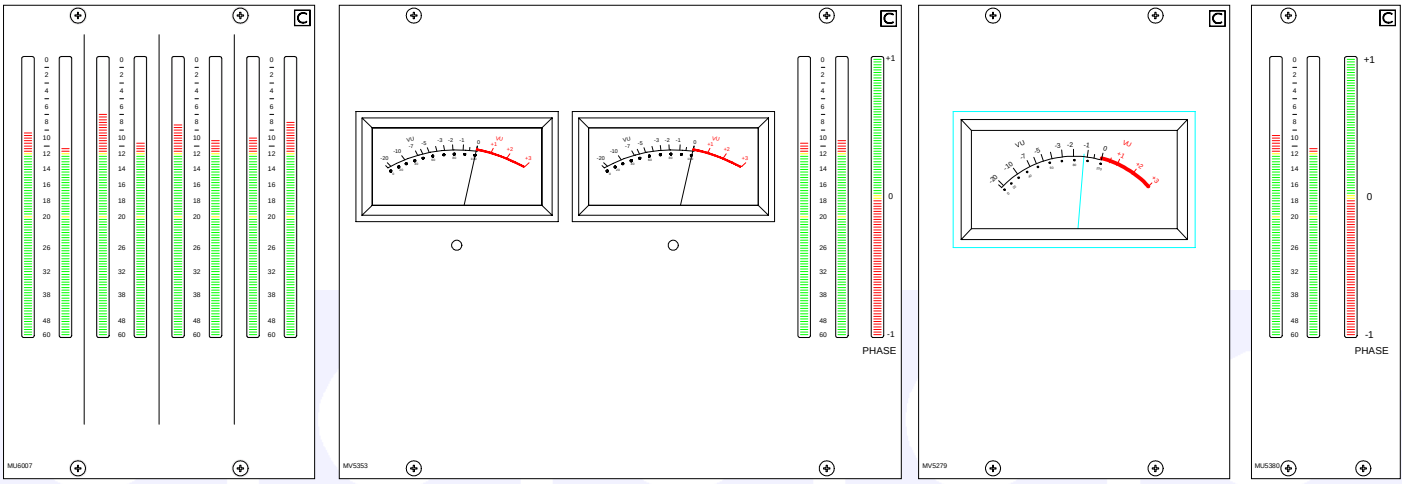
Pressing the Console Reset button resets the Control System only. Independent DSP operation ensures audio continuity during console reset. The most recent console settings will be fully restored in less than 15 seconds.

The Rack Reset button reboots the racks only, without affecting the control surface.

### PC Reliability

As the console operates independantly of the PC, rebooting or failure of the PC will affect neither the audio nor the operation of the console.

## METERING OPTIONS




### Main and Ancillary 1 Meters

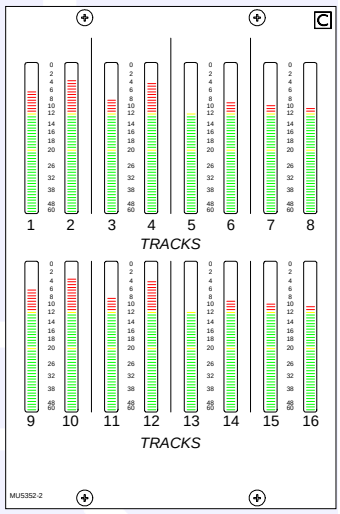
The Main and Ancillary 1 Meters can each be stereo only, surround only, or surround plus stereo (displaying a downmix of the surround signal). There can be a separate M/S meter (fed from the same downmix). They can be PPM's, VU's, Bargraphs, Phase displays incorporating bargraphs, or a mixture of these.

The MAIN METERS are fed from the Main meter selector which is on the Monitor Selector module. The two selection buttons can be pre-set to either Main 1 or 2 Desk (pre Tone & TB), or Main 1 or 2 Line (which can be an external input). An M/S button can be fitted if there is a stereo meter and no separate M/S meter.

All meters in the meter bridge, including moving coil types, are fed directly from the internal meter system, except for any Phase Displays which will require audio outputs from the I/O Rack. The meter bridge is continental height allowing alternative European bargraph meters to be fitted. These would need additional audio outputs from the I/O Rack.

### Other Meters

A comprehensive set of optional meters are available, for example:




- Track Bargraphs displaying the Track output levels, post Tone &TB.
- ANCILLARY 2 Meter: This is Stereo only. It can be PPM's, VU's or bargraphs.
- Stereo APFL or Surround AFL Bargraph. AFL is monitored post the channel/group panning. The APFL meter will display the stereo downmix of these signals.
- Single bargraph displaying signal on the mix minus bus (Mono).
- 8 stereo bargraphs for the Groups. For mono groups, the meter will display the left bar only.

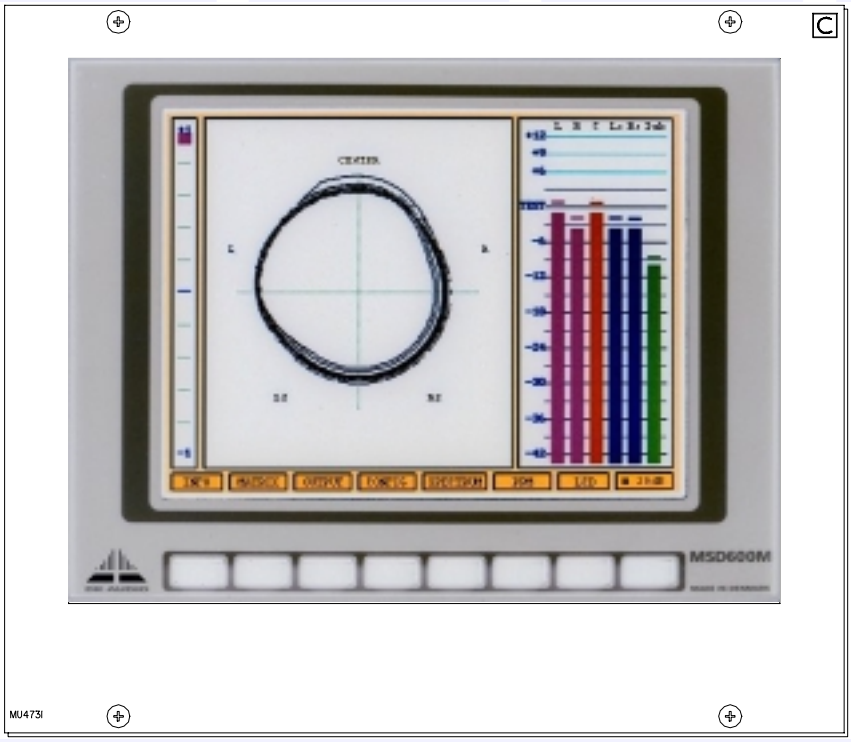
Calrec can supply either bargraphs, Moving Coil VU or PPM meters. All meters in the meter bridge, including moving coil types, are fed directly from the internal meter system.

Calrec bargraphs provide a bar which can be set to either VU or PPM. In addition, there can be a True Peak spot (which incorporates a long release time). Together, these allow the operator to see the level of the signal using a familiar meter and at the same time to see how close the peaks of the signal are to the digital maximum.

The bargraphs can have two yellow markers at specified points to mark the “nominal” and “peak” levels. The top of the bargraph always equals full scale digital level. The scale on the bargraph is normally 0 (at the top) to -60 in dB. Other scales can be provided to special order.

**Optional Third Party Metering**

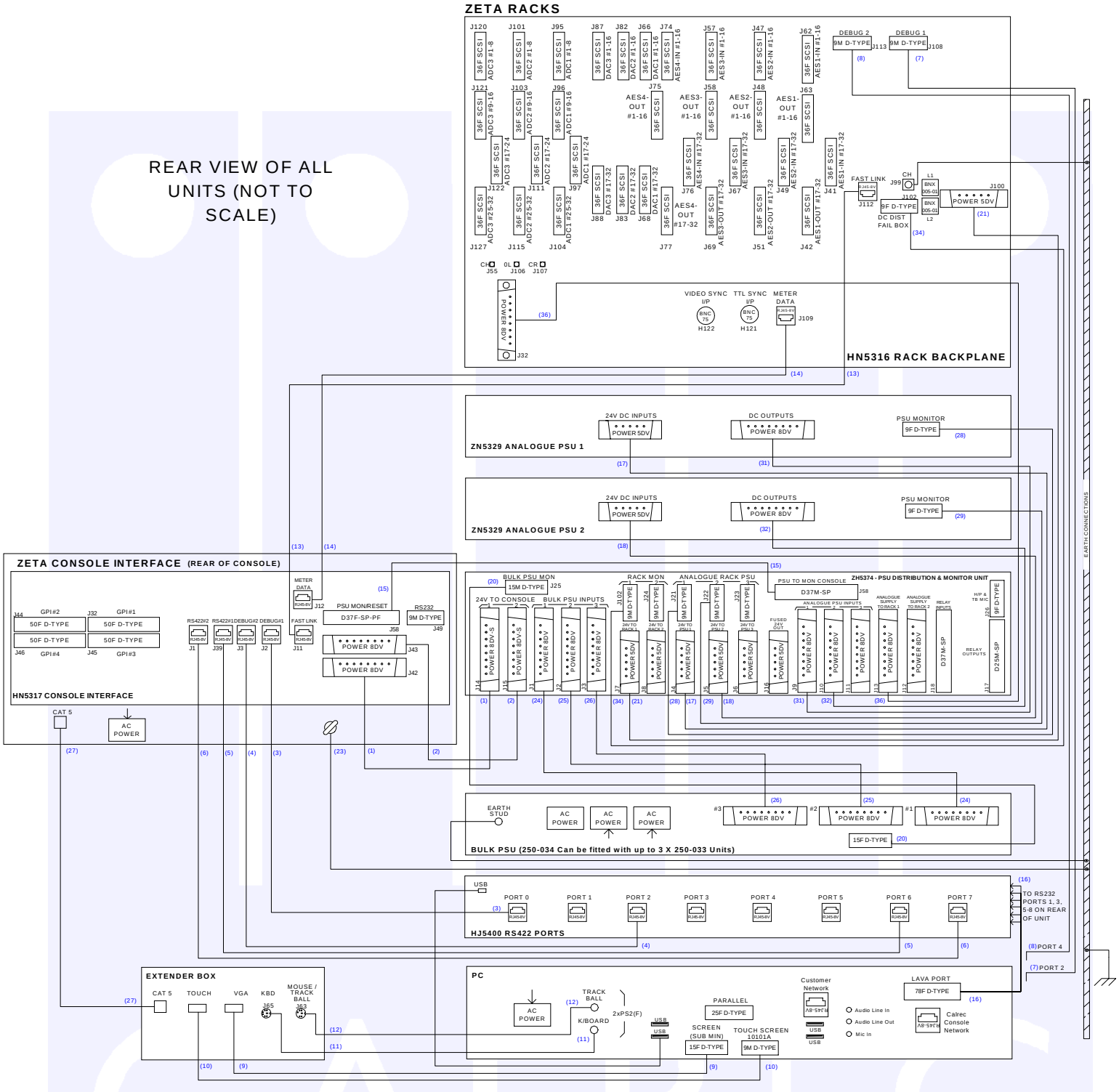
It is possible to incorporate third party metering options into the Zeta 100 design, such as the DK Audio MSD600M shown here. This should be fed from the ANC 1 meter selector, and will require audio outputs from the processing rack.



# Technical 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 | ZH52374 | J14 | 8way D (M) | HN5317 | J42 | 8way D(F) | Console DC pwr 1 |
| 2 | ZH52374 | 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 | LAVA PORT | 78way HDD(F) | LAVA PORT Lead |
| 17 | ZH52374 | J4 | 5way D(M) | ZN5329 #1 | 24V DC I/P | 5way D(F) | 24V To Analogue PSU1 |
| 18 | ZH52374 | J5 | 5way D(M) | ZN5329 #2 | 24V DC I/P | 5way D(F) | 24V To Analogue PSU2 |
| 19 (Not Shown) | ZH52374 | 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 | ZH52374 | 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 | ZH52374 | 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.

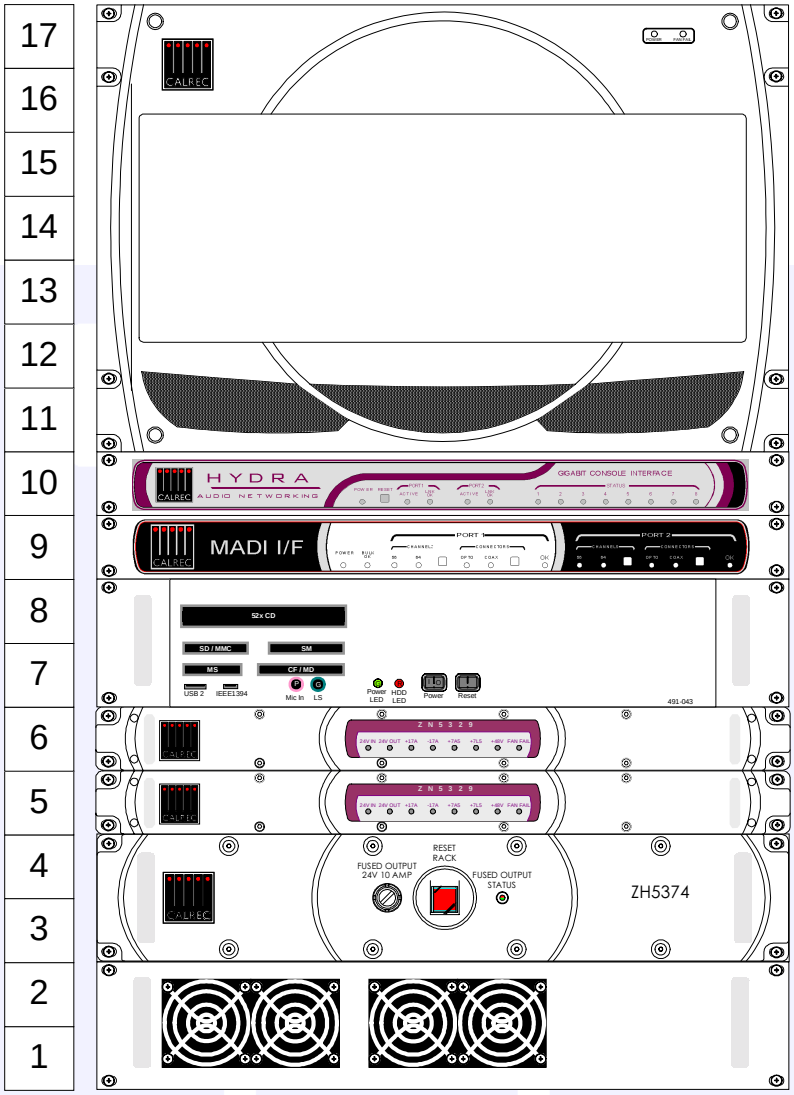
## MAXIMUM CABLE LENGTHS

| 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.

## RACK SPECIFICATIONS

Rack Units




PROCESSING RACK (CONTAINS ALL I-O, DSP AND CONTROL PROCESSING HARDWARE)

OPTIONAL HYDRA GIGABIT INTERFACE UNIT

OPTIONAL MADI INTERFACE UNIT

PC

MULTI-RAIL PSU #1

MULTI-RAIL PSU #2 (OPTIONAL HOT SPARE)

POWER MONITORING AND DISTRIBUTION UNIT

BULK PSU

(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 | | |
| Processing Rack (Unpopulated) | 7U | 19.7 | 500 | 29.5 | 13.4 | - | - |
| Processing Rack (Populated) | 7U | 19.7 | 500 | 53.2 | 24.2 | - | - |
| Bulk PSU rack with one PSU* | 2U | 18.5 | 470 | 17.5 | 8 | 1000 | 1250 |
| Multi-Rail PSU * (24V DC I/P - Fed from Bulk PSU) | 1U | 18.1 | 460 | 25 | 11.4 | - | - |
| Power for Hot spare (any type) | - | - | - | - | - | No extra | Less than 5% extra |
| PSU Monitor & Distribution box * | 2U | 19.1 | 485 | 11.5 | 5.2 | - | - |
| PC* | 2U | 23.7 | 600 | 27 | 12.2 | - | 400 |
| MADI Unit | 1U | 11.9 | 300 | 6.6 | 3 | - | - |
| Hydra Gigabit Interface Unit | 1U | 10.4 | 265 | 5.5 | 2.6 | - | - |

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

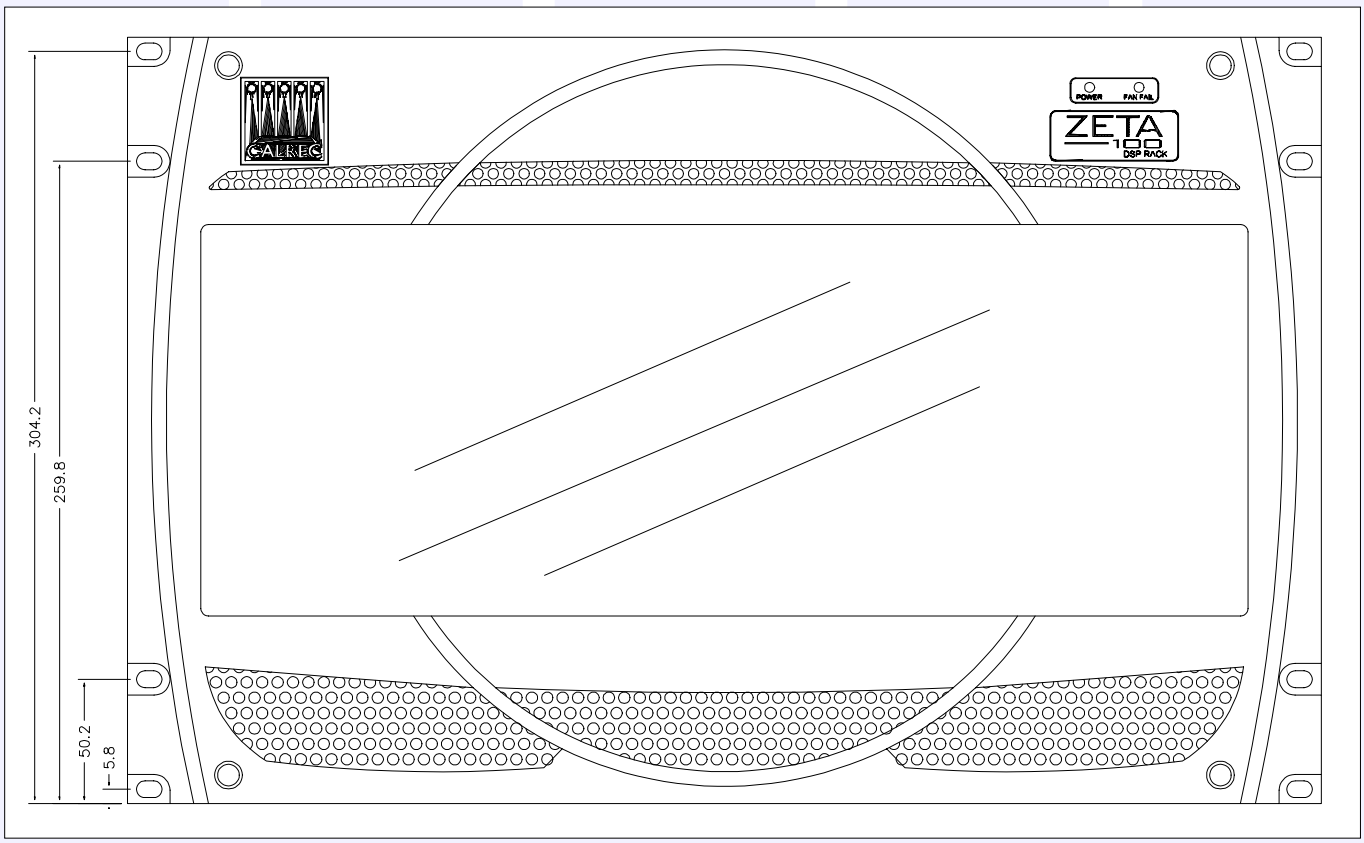
## 7U MAIN PROCESSING RACK

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.

The Processing rack houses all the DSP, I/O and control cards for the Zeta 100 system. There are:

- 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 either AES I/O cards or Wide Area Bulk Cards

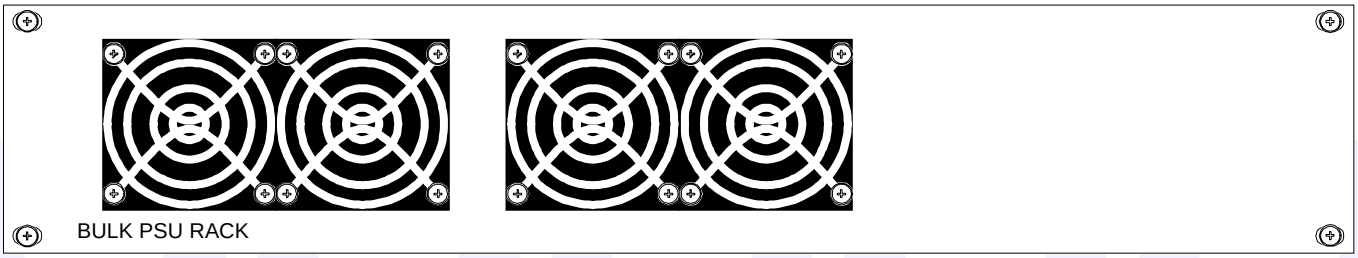
Incorporated into the rack is a built-in low noise fan tray, situated above the processing area. The fan tray incorporates a baffle such that warm air is drawn out of the rack and out through the rear of the fan tray.



## POWER SYSTEM

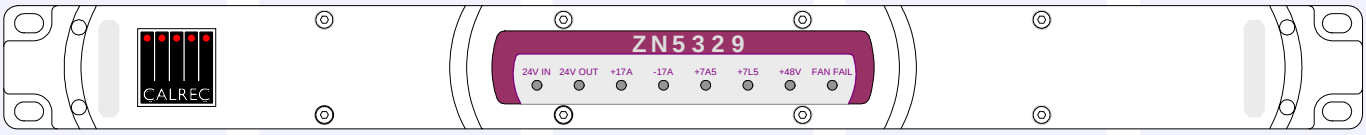
All PSU's are rack mounting and are separate from the units they power, except for the PC which has its PSU built in. Diode feeding allows supplies of the same type to be parallelled together.

### Bulk PSU



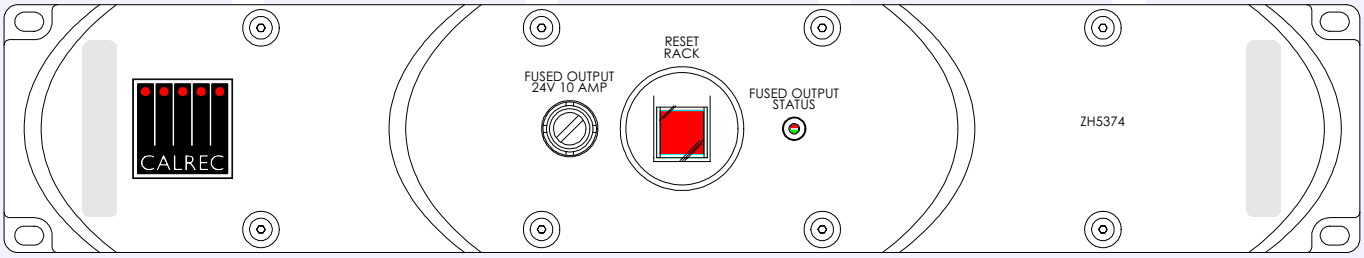

The Bulk PSU Rack is a 2U rack which can hold up to three identical plug-in PSU's. The rack has separate AC power inputs and DC outputs for each of the three PSU's. Any one PSU can be removed from the rack without disturbing the operation of the others in the rack. One PSU in this rack is sufficient to power the control surface and digital rack components in a standard system, an optional second PSU in the rack can act as a hot spare. The rack is fan cooled with fans mounted in the front of each PSU. The warm air is directed out of the rear of the rack. To ensure proper cooling, there must be a minimum clearance of two inches (50mm) from the fans and rear air outlets, and also any walls or other surfaces.

### Multi-Rail PSU




The analogue components in the system use a different 1U Multi-Rail PSU. The number of PSU's required will depend on the type of installation. The Multi-Rail PSU is also fan cooled but uses a very low noise fan, drawing air from side to side through the PSU instead of in from the front, to minimise noise. The Multi-Rail PSU's are fitted with rear flanges to allow the rear of the PSU to be bolted to the studio equipment bay. All hot spare PSU's are optional.

### PSU Monitoring and Distribution Unit



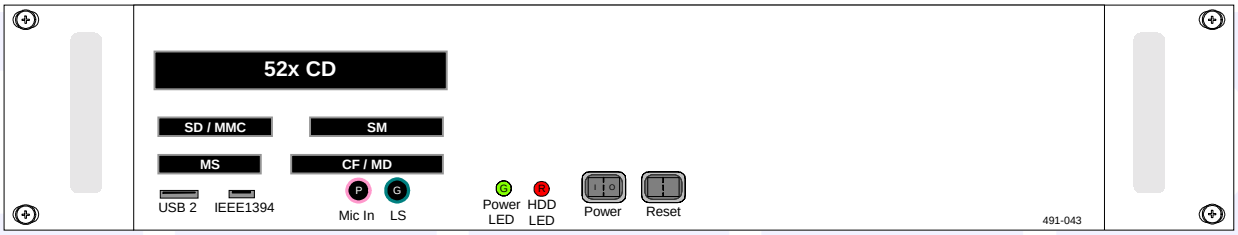

The Power Monitoring and Distribution rack performs many functions. It monitors the power supplies for failures, and ensures "hot" changeover to the spare should there develop a fault. In addition to connections for power combining and distribution, the module includes:

- A front-mounted rack reset button.
- 8 x changeover relays intended for switching balanced talkback audio.
- Opto-isolated fan fail and PSU fail inputs.

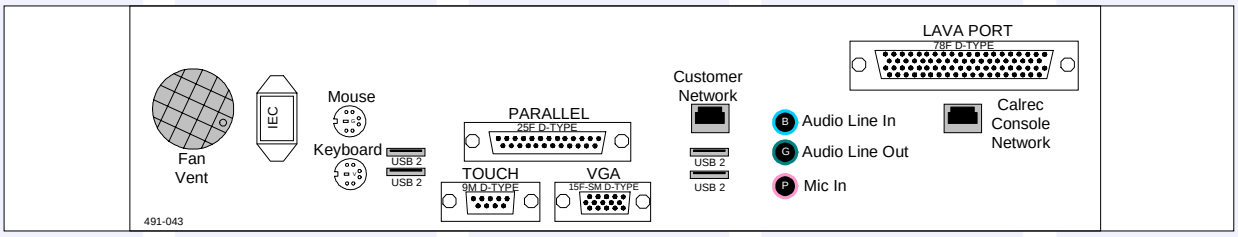
## PC INFORMATION

| | |
|---|---|
| **Operating System** | Windows 2000 |
| **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** | Lava Octopus 8 Port Serial Card |
| **Additional Software** | PC Antywhere |

Front




Rear




### Remote Access

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

### Network Ports

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

### 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.

### Software Supplied

An OEM PC Operating System license is supplied with each console, and the operating system software is pre-installed. The Zeta 100 console software will also be pre-installed, and will be supplied on a CD-ROM.

### 3rd Party Software

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

## SYSTEM SPECIFICATION

| DIGITAL INPUTS | |
|---|---|
| Word Length | 24-Bit |
| Formats Supported | AES/EBU (AES3)<br>Also suitable for use with SPDIF (IEC958 Type 2) signals |
| Interface | 110 Ohm transformer balanced<br>75 Ohm unbalanced (BNC) |
| Sample Rate Conversion | 24-Bit switchable on all digital inputs |
| SRC THD+N | -117dB @ 1kHz, 0.00014% |
| **DIGITAL OUTPUTS** | |
| Word Lenght | 24-Bit |
| Formats Supported | AES/EBU (AES3) |
| Interface | Transformer balanced 4V Pk-Pk (nominal) into 110 Ohm load<br>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%<br>-20dBFS @ 1kHz - Better than 0.004%<br>-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%<br>-20dBFS @ 1kHz - Better than 0.006%<br>-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<br>Internal Crystal Reference<br>TTL Wordclock<br>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

**NOTES**




(926-080 Iss.7)