SIGMA 100

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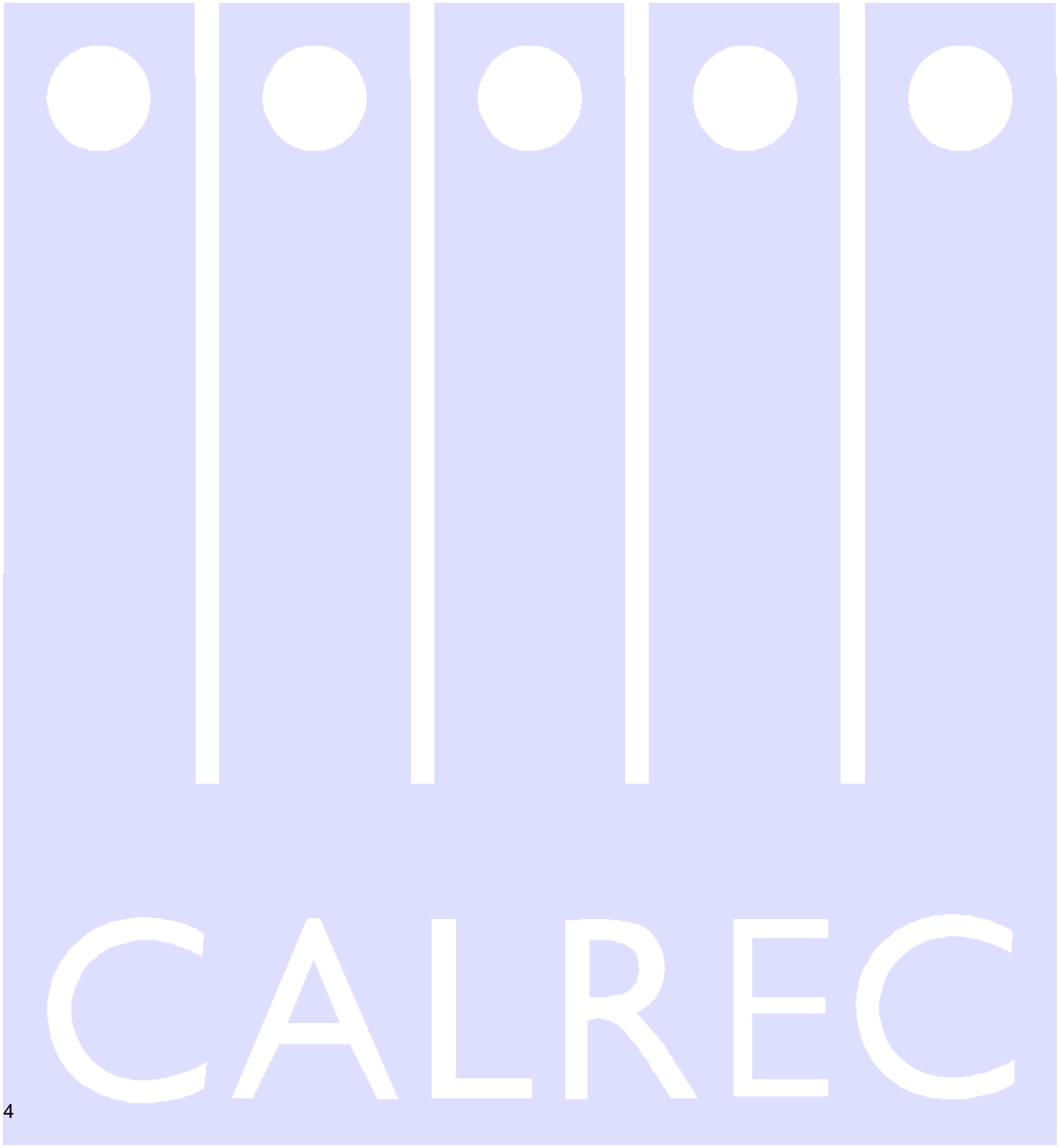

CALREC

Overview

INTRODUCTION

The Sigma 100 is Calrec's second all digital production console designed for the most critical broadcast production and on-air applications. Based on the well established Alpha 100 digital system architecture, Sigma 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 Sigma 100 reflects this in its user interface. Fully assignable control means that any fader can control any channel, group or main output. The flexibility offered by digital control and a computer-aided memory system has been harnessed to provide greater functionality and ease of use.

Sigma 100 has been carefully configured to provide a high level of facilities and a no-compromise technical specification at a very competitive cost. It is available in four cost-effective processing / input configurations and four frame sizes, with a variety of additional input and output interface options. These packages provide focused levels of technical provision by keeping down the costs associated with large format consoles, 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, 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. The Sigma 100 is designed to ensure this level of confidence will continue in the digital era.

ISO 9001 AND RAB REGISTERED

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 64 faders, with A & B layers of control, plus 2 main output faders with 2 sub-main outputs available on a second layer of control.
120 equivalent channels: Up to 48 stereo plus 24 mono channels or 60 stereo channels.
Comprehensive surround panning and monitoring with optional motorised joystick.
Optional I/O expansion via a wide area interface such as MADI or Hydra, Calrec's sophisticated audio networking system.

Channel / Group Facilities

All channels have 4-band EQ, 2-band filters, compressor and expander/gate.
Up to 12 auxiliary outputs which can be 12 mono or 6 stereo.
All groups have compressor and expander/gate.
Inserts can be pre EQ (on channels), pre fader or post fader.
Pre configured inserts are assignable to any channel or group.
All channels and groups have direct outputs, which can be pre EQ (on channels), pre fader, or post fader.
Every direct output can be a mix minus feed.
All faders are motorised - a centrally assigned fader is also motorised.

Routing

8 stereo or mono audio groups.
Additional VCA style grouping system.
Up to 24 outputs for multi-track or general purpose feeds.
Tracks can be fed from pre EQ, pre fader, post fader or direct output.
2 main plus 2 sub-main stereo or 5.1 surround outputs with compressors.
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.
Sophisticated GPI facilities.
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.
Automatic change over to hot spares for PSU's, Control cards & DSP cards.
Hot plugging of every card and module.
Hot plugged cards initialise upon insertion.

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.

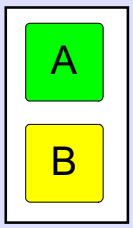
The faders are motorised so, when switching between A and B, the fader will move to the correct position.

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. The Assign buttons are labelled A & B for channel or group paths, and M1, M2, S1 or S2 for the Main and Sub-Main output paths on the Main faders. Pressing the Assign button causes the central control modules (the “Assign Panels”) to display and control the settings for that fader’s Channel, Group or Main 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 will be used at any one time. To provide both types 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 and 2), which can be any combination of Mic/Line and Digital. Both inputs can be set up independently, using separate input controls (input gain, phase reverse, 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. Each Audio Pack includes a suggested complement of ports, the nearest of which can be chosen to match the requirements of the installation. The port quantities can then be fine tuned appropriately.

SIGNAL PATHS

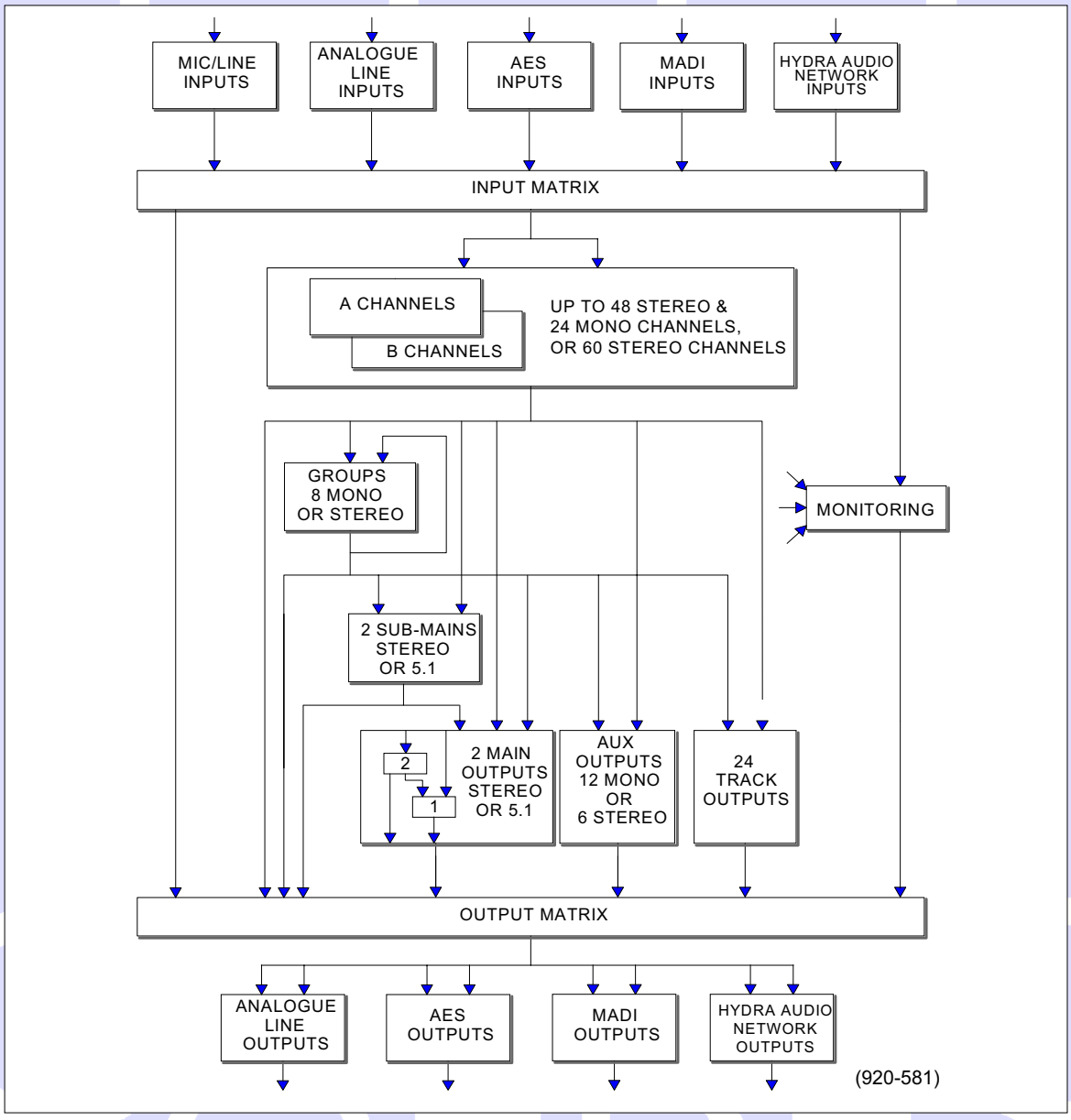
The Sigma 100 system can have 120 equivalent channels: Up to 48 stereo plus 24 mono channels, or 60 stereo channels.

The 8 groups can each be designated as stereo or mono. In addition, as many VCA style groups as required, can be created.

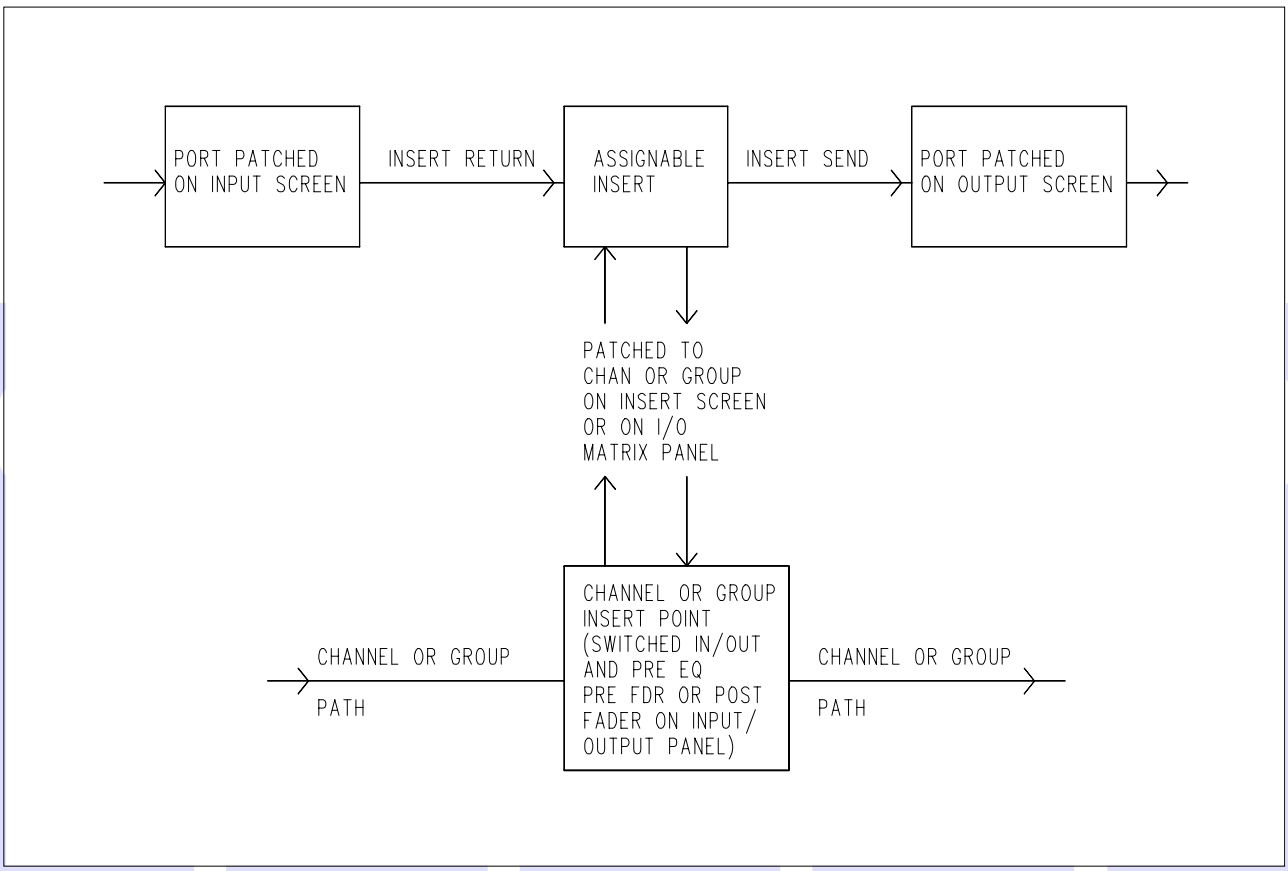
The 2 Main plus 2 Sub-Main outputs can each be designated as Stereo or 5.1 Surround. If they are 5.1 Surround, then a mono rear is derived at the output to allow them to be used as LCRS mains. Stereo and Mono downmixes of the 5.1 are also produced.

If a channel is panned to both a Stereo 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 12 Mono auxiliary outputs can be paired up to give up to 6 Stereo auxiliary outputs.



ASSIGNABLE INSERTS



The system provides a pool of 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 assignable inserts 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 optional I/O Matrix panel (if fitted).

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 also be divided into up to 4 lists in a similar way to I/O. This separates them for selection on the optional I/O matrix panel pot-switch (if fitted).

It is recommended to specify the number and type of ports for inserts corresponding to the number and type of insertable devices available plus a small number for occasional devices via a patch bay.

INPUTS & OUTPUTS

There are two types of ANALOGUE INPUT CARD:

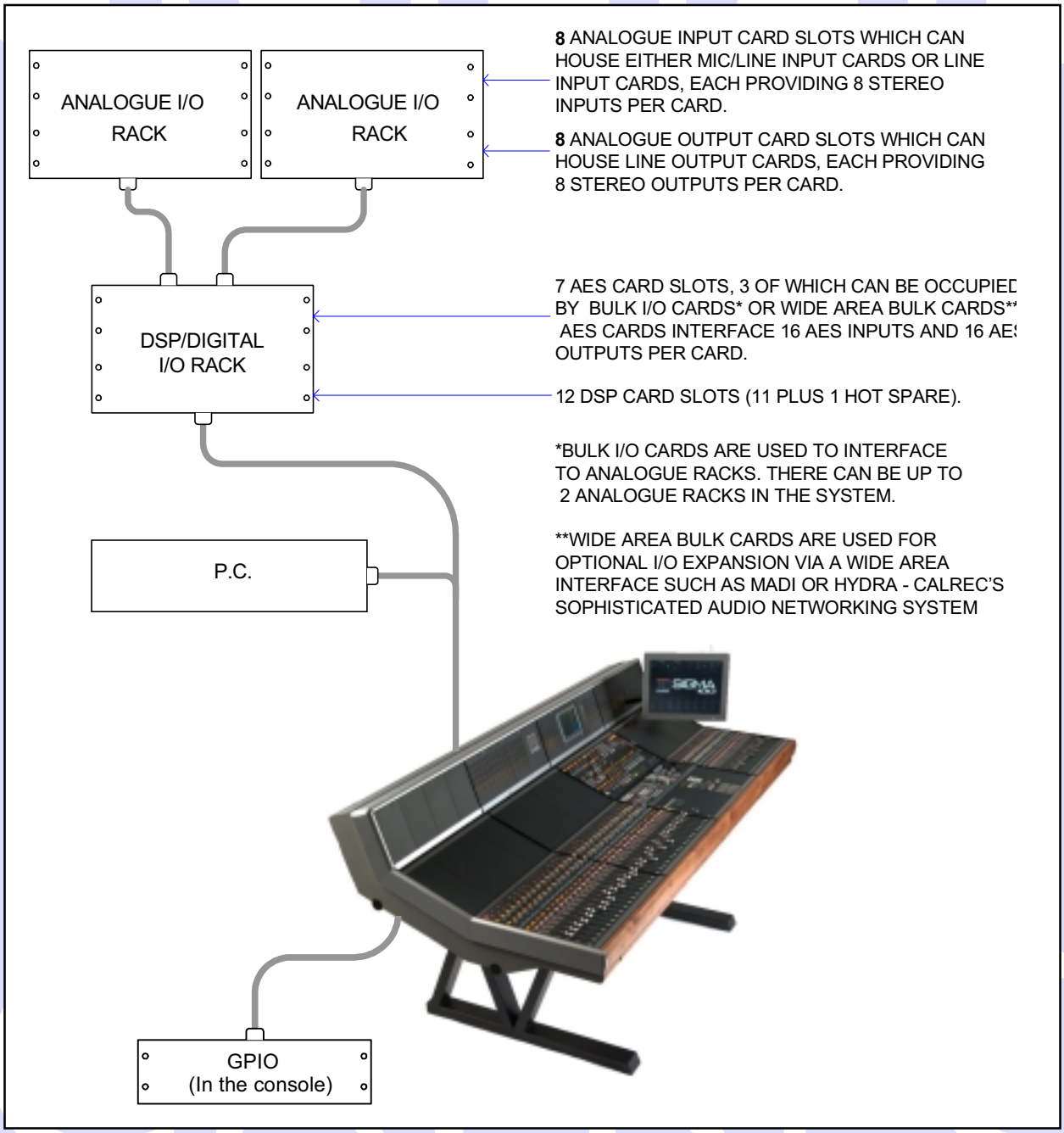
- Analogue Mic/Line input with 16 Mono (8 Stereo) inputs per card.
- Analogue Line input with 16 Mono (8 Stereo) inputs per card.

There is one type of ANALOGUE OUTPUT CARD:

- Analogue Output card with 16 Mono (8 Stereo) line outputs per card.

There is a DIGITAL (AES3) INPUT/OUTPUT CARD:

- Digital (AES3) input/output card with 16 AES inputs and 16 AES outputs per card. All inputs have switchable sample rate conversion.



AUDIO PACKS

The Sigma 100 series is supplied in combinations of four basic processing cores (packs) providing pre-defined numbers of channels and I/O. Each of the four core provisions A, B, C and D are available with all stereo channels or a specific mono/stereo configuration as described below:

Provision A

Available Configurations **A1** - 64 equivalent channels: 12 mono and 26 stereo
OR **A2** - 72 equivalent channels: 36 stereo

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

Provision B

Available Configurations **B1** - 80 equivalent channels: 24 mono and 28 stereo
OR **B2** - 88 equivalent channels: 44 stereo

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

Provision C

Available Configurations **C1** - 94 equivalent channels: 30 mono and 32 stereo
OR **C2** - 96 equivalent channels: 48 stereo

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

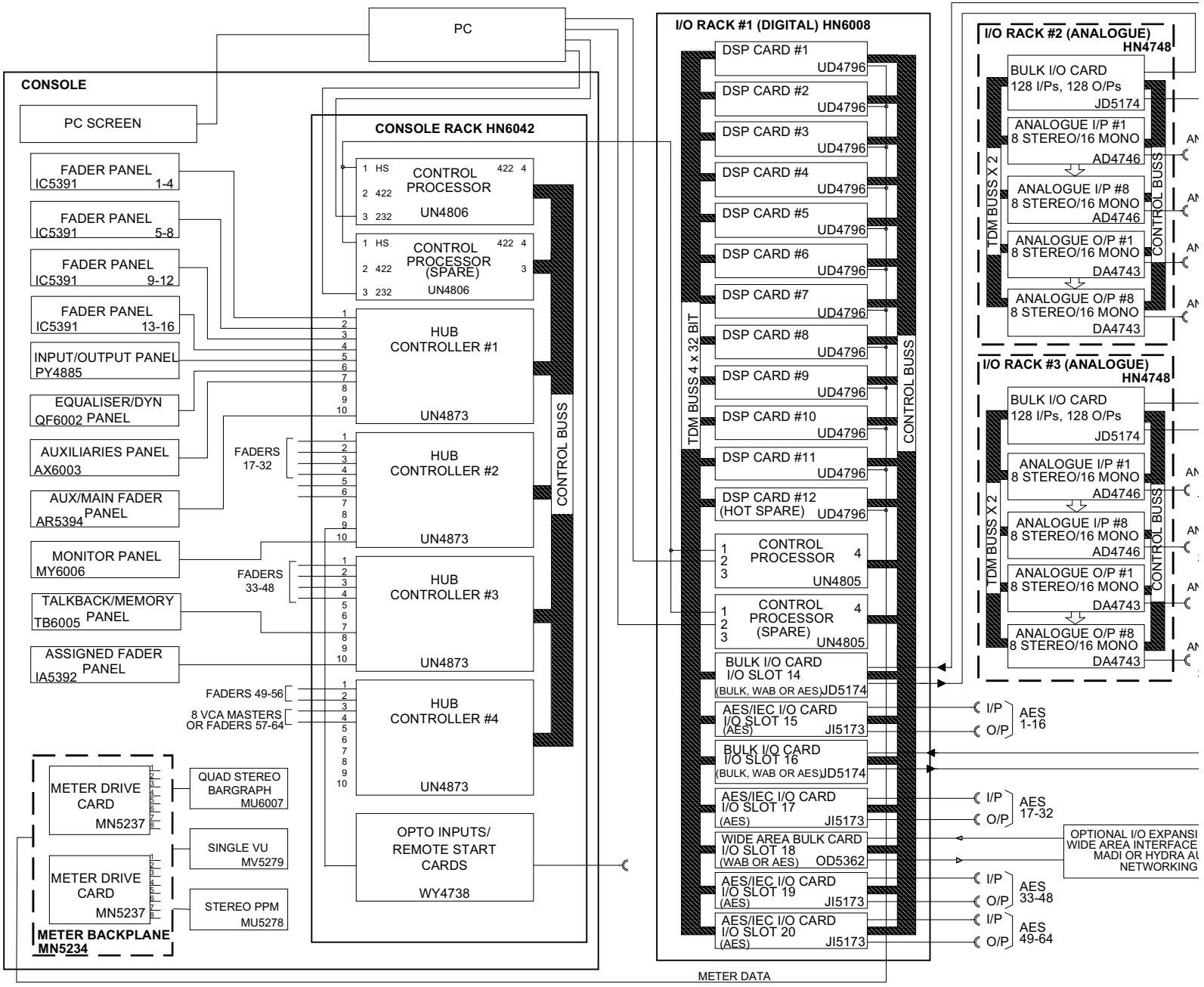
Provision D

Available Configurations **D1** - 120 equivalent channels: 24 mono and 48 stereo
OR **D2** - 120 equivalent channels: 60 Stereo

Inputs/Outputs
96 Mono Mic/Line Input Ports
32 Mono Line Input Ports
112 Mono Line Outputs
80 Stereo AES Inputs
80 Stereo AES Outputs

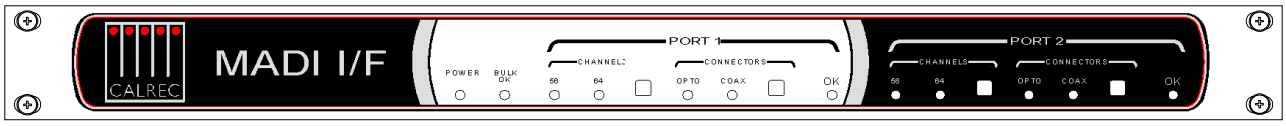
All desk output allocations must be derived from the above standard port provisions. However, they may be expanded by purchasing additional interface cards. If it is necessary to specify I/O interfaces which are less than a standard provision, this can be achieved by specifying a larger system and reducing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

TYPICAL DIGITAL SYSTEM DIAGRAM



OPTIONAL I/O EXPANSION VIA WIDE AREA INTERFACES

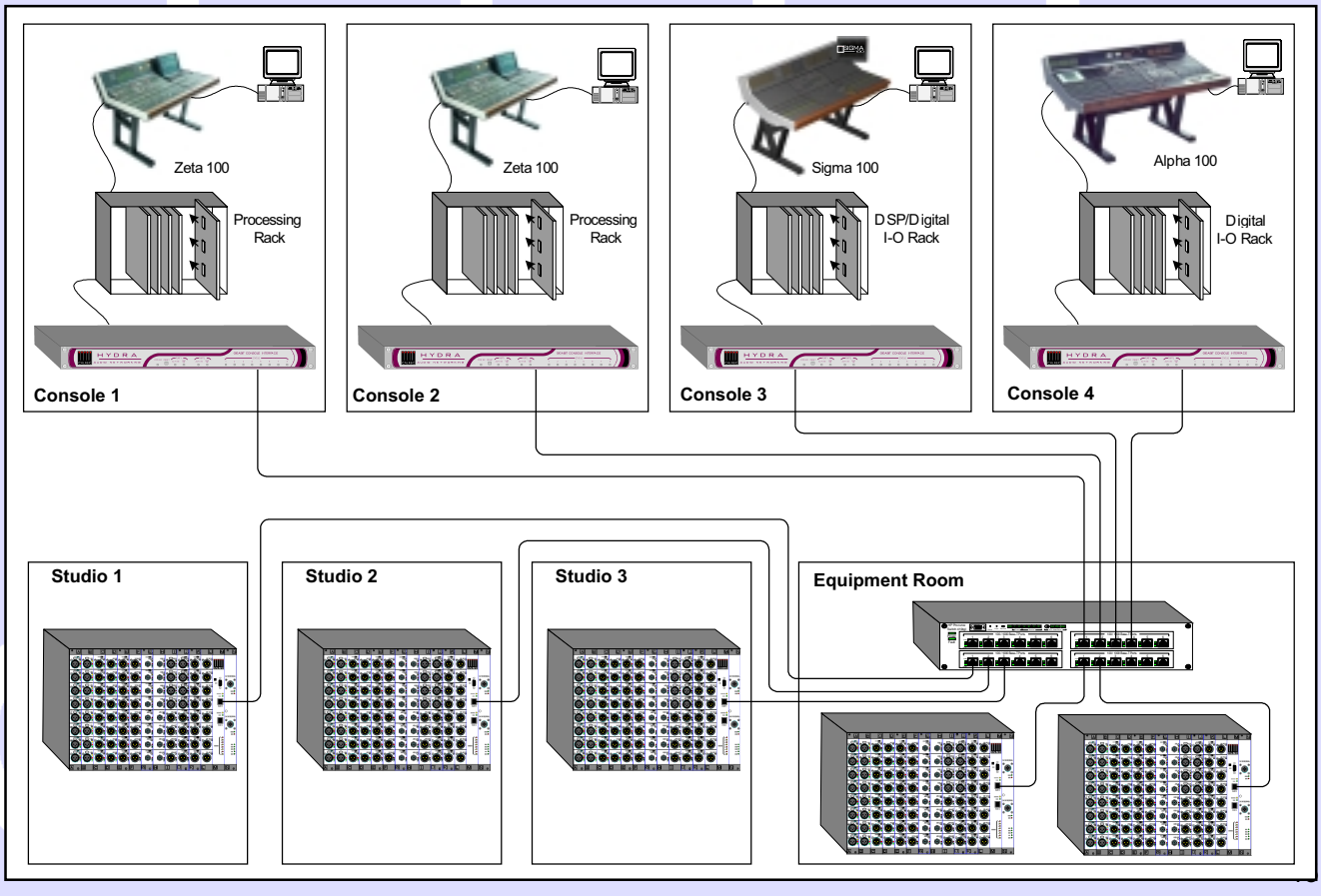
MADI

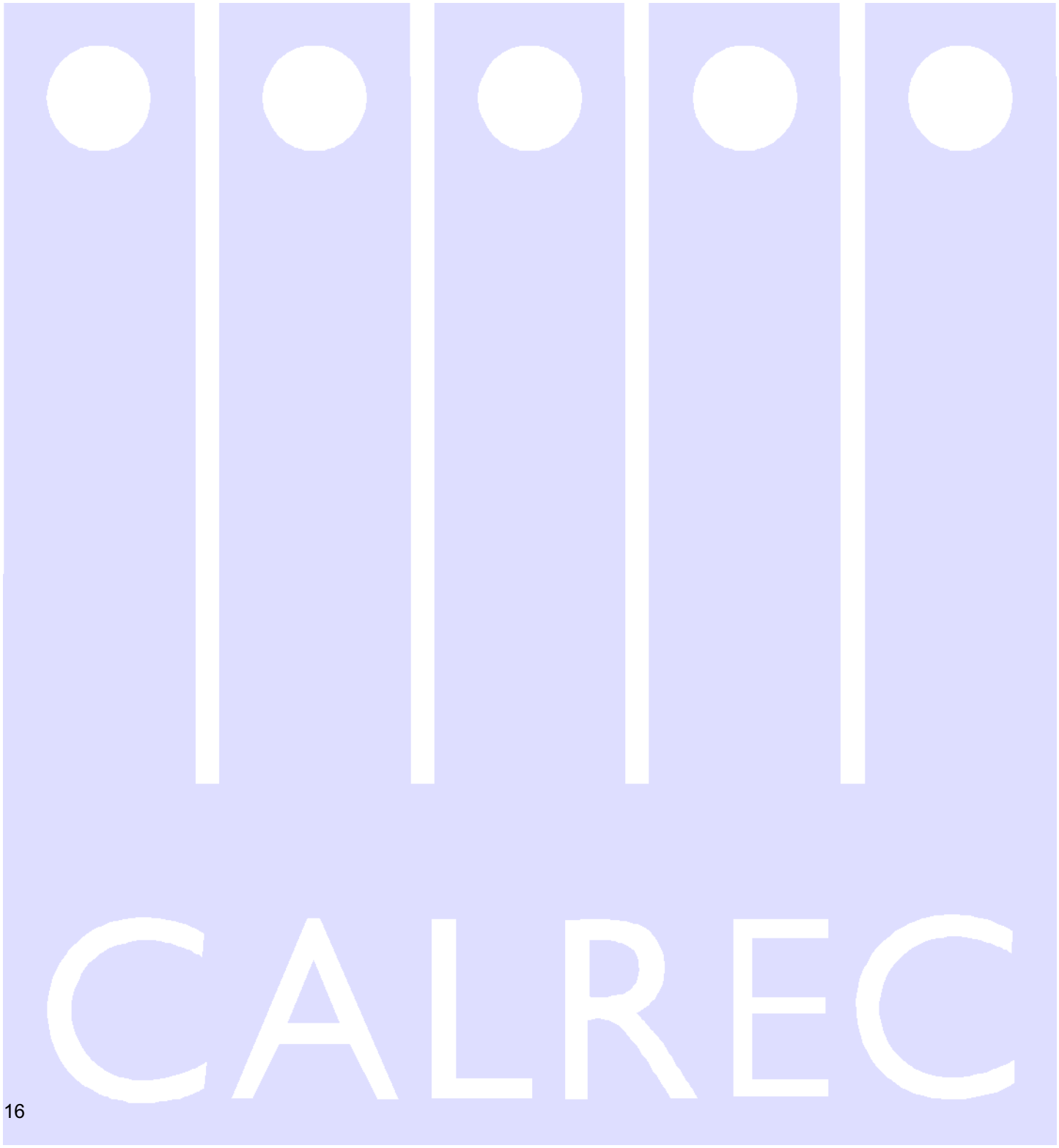


The rack mounted MADI Interface unit contains two independent, AES10 MADI compatible interfaces, and is available as an option. The two ports are interfaced to the Sigma 100 system via a Wide Area Bulk (WAB) card, which occupies one of the AES card slots in the DSP & Digital I/O Rack. Each MADI interface can operate in either 56 or 64 channel mode and can transmit over a coaxial AND optical medium and receive over a coaxial OR optical medium. A switch allows receiver selection. There is no Sample Rate Conversion available on MADI inputs or outputs therefore, all the equipment connected via MADI must be synchronised to the same source as the console.

HYDRA

The Hydra Audio Networking System provides a powerful network for sharing of I/O resources and control data between Calrec digital consoles. In addition, remote I/O units, with up to 96 inputs/outputs, analogue or digital, may be connected onto the same network, providing remotely located sources and destinations that can be used by any or all mixing consoles. The Sigma 100 system interfaces to the Hydra Gigabit Interface Unit via a Wide Area Bulk (WAB) card, which occupies one of the AES card slots in the DSP & Digital I/O Rack.




CALREC

Frame Options & Dimensions

3 SECTION FRAME (4:4:4)
TYPICAL LAYOUT WITH 32 FADERS USING LANDSCAPE MONITOR PANEL

4 x Twin Bargraph	4 x Twin Bargraph	4 x Twin Bargraph	CALREC SIGMA 100	4 x Twin Bargraph	DK Audio Meter MSD600		Console Reset	4 x Twin Bargraph	4 x Twin Bargraph	4 x Twin Bargraph	TB Mic / Rack Reset	
				Input/ Output Controls	Equaliser & Dynamics	Track Routing Aux O/P 1-4		Main Faders & Routing Aux O/P 5-6	Memory & TB Selector	LCD Screen		
Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Monitor Selector Panel				Track -ball Panel	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader
				Assign-able Fader		Space for Optional Dedicated Group Faders						

Keyboard in Tray

The smallest frame size is made up of 3 sections, and can house 32 faders (with the landscape monitor panel). This example shows a 32 fader console, which with 2 audio paths on each fader, allows up to 64 “Channel Faders” within a frame only 1547mm wide. Optional dedicated group faders can be fitted if required. Shaded section denotes the “Assign” Panels.

3 SECTION FRAME (4:5:4)
TYPICAL LAYOUT WITH 48 FADERS USING PORTRAIT MONITOR PANEL

4 x Twin Bargraph	4 x Twin Bargraph	4 x Twin Bargraph	4 x Twin Bargraph	DK Audio Meter MSD600		Console Reset	Single VU Meter	Single VU Meter	4 x Twin Bargraph	4 x Twin Bargraph	4 x Twin Bargraph	TB Mic / Rack Reset	
	CALREC SIGMA			Input/ Output Controls	Equaliser & Dynamics		Monitor Selector Panel		Track Routing Aux O/P 1-4	Main Faders & Routing Aux O/P 5-6	Memory & TB Selector	LCD Screen	
Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Assign-able Fader		Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader

Keyboard & Trackball in Tray

This example shows a 48 fader console using a 4:5:4 frame and the portrait monitor panel, which with 2 audio paths on each fader, allows up to 96 “Channel Faders” within a frame only 1672mm wide. Shaded section denotes the “Assign” Panels. “Channel” faders can control channels or groups.

4 SECTION FRAME (4:4:4:4)
TYPICAL LAYOUT WITH 48 FADERS USING LANDSCAPE MONITOR PANEL

	4 x Twin Bargraph	4 x Twin Bargraph	4 x Twin Bargraph		4 x Twin Bargraph	4 x Twin Bargraph	CALREC SIGMA	4 x Twin Bargraph	DK Audio Meter MSD600	Console Reset	4 x Twin Bargraph			TB Mic	Rack Reset	
								Input/ Output Controls	Equaliser & Dynamics	Track Routing Aux O/P 1-4	Main Faders & Routing Aux O/P 5-6	Memory & TB Selector	LCD Screen			
Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Monitor Selector Panel				Track -ball Panel	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader
								Assign-able Fader		Space for Optional Dedicated Group Faders						

Keyboard in Tray

This frame size is made up of 4 sections, and can house 48 faders (with the landscape monitor panel). This example shows a 48 fader console, which with 2 audio paths on each fader, allows up to 96 “Channel Faders” within a frame only 2053mm wide. Optional dedicated group faders can be fitted if required. Shaded section denotes the “Assign” Panels.

4 SECTION FRAME (4:4:5:4)
TYPICAL LAYOUT WITH 64 FADERS USING THE PORTRAIT MONITOR PANEL

4 x Twin Bargraph	4 x Twin Bargraph	4 x Twin Bargraph	CALREC SIGMA	DK Audio Meter MSD600		Console Reset	Single VU Meter	Single VU Meter	Single VU Meter	Single VU Meter	4 x Twin Bargraph	4 x Twin Bargraph	4 x Twin Bargraph	4 x Twin Bargraph	TB Mic Rack Reset				
					CALREC SIGMA		Input/ Output Controls	Equaliser & Dynamics	Monitor Selector Panel		Track Routing Aux O/P 1-4	Main Faders & Routing Aux O/P 5-6	Memory & TB Selector			LCD Screen			
Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader		Wild Assign Channel Fader	Wild Assign Channel Fader	Assign-able Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader

Keyboard & Trackball in Tray

This frame size is made up of 4 sections (4:4:5:4), and can house up to 64 faders (with the portrait monitor panel). This example shows a 64 fader console, which with 2 audio paths on each fader, allows up to 128 “Channel Faders” (more faders than the maximum number of available paths), within a frame only 2178mm wide. Shaded section denotes the “Assign” Panels. “Channel” faders can control channels or groups.

5 SECTION FRAME (4:4:4:4:4)
TYPICAL LAYOUT WITH 64 FADERS USING LANDSCAPE MONITOR PANEL

				4 x Twin Bargraph	4 x Twin Bargraph	4 x Twin Bargraph	CALREC SIGMA	4 x Twin Bargraph	DK Audio Meter MSD600	Console Reset	4 x Twin Bargraph	4 x Twin Bargraph	4 x Twin Bargraph	TB Mic / Rack Reset					
								Input/ Output Controls	Equaliser & Dynamics	Track Routing Aux O/P 1-4	Main Faders & Routing Aux O/P 5-6	Memory & TB Selector		LCD Screen					
Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Monitor Selector Panel			Track -ball Panel	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader	Wild Assign Channel Fader
								Assign-able Fader											

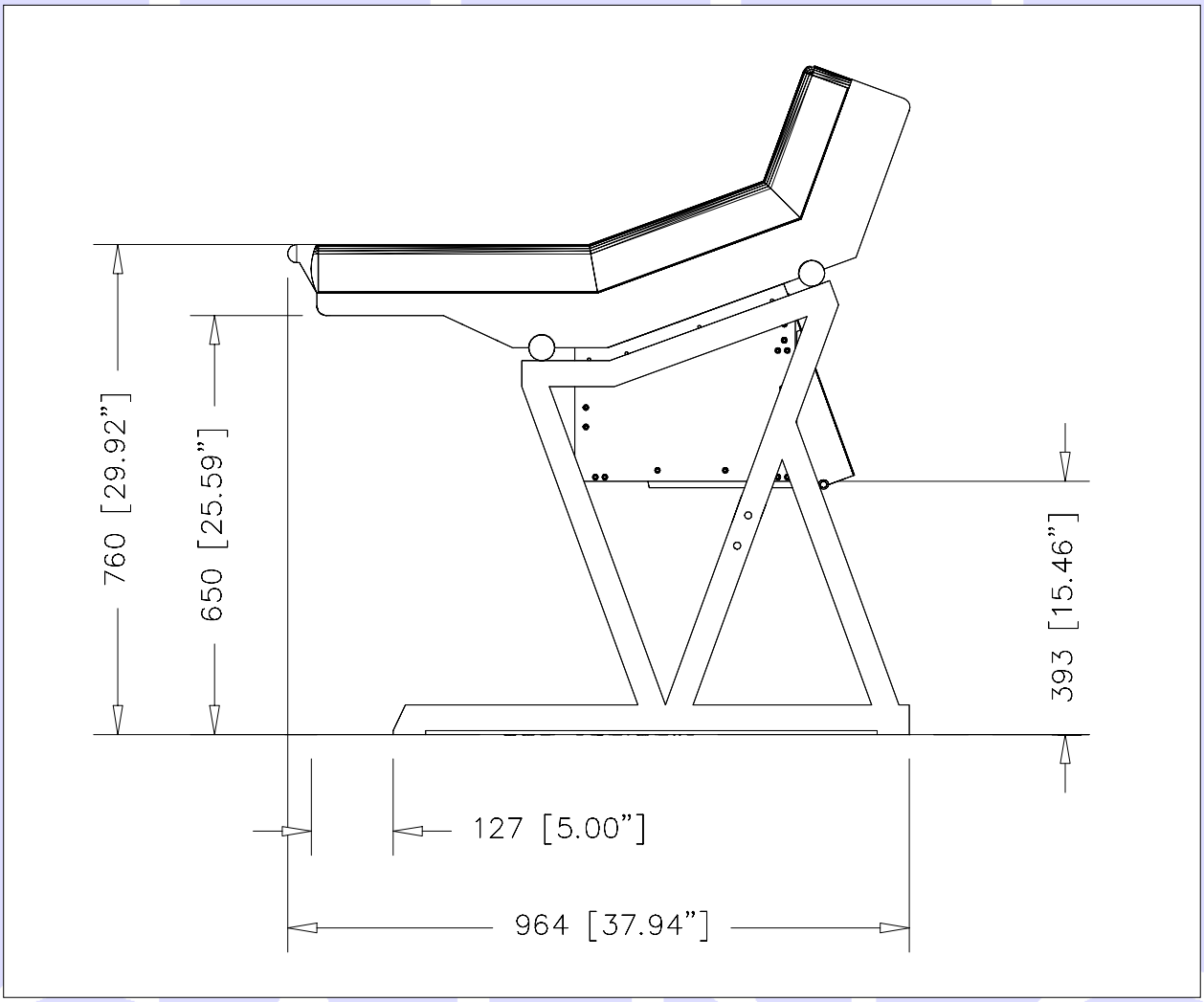
Keyboard in Tray

This frame size is made up of 5 sections, and can house up to 64 faders (The maximum available). This example shows a 64 fader console, which with 2 audio paths on each fader, allows up to 128 “Channel Faders” (more faders than the maximum number of available paths), within a frame only 2559mm wide. Shaded section denotes the “Assign” Panels. “Channel” faders can be used to control channels or groups.

CONSOLE PLAN DIMENSIONS

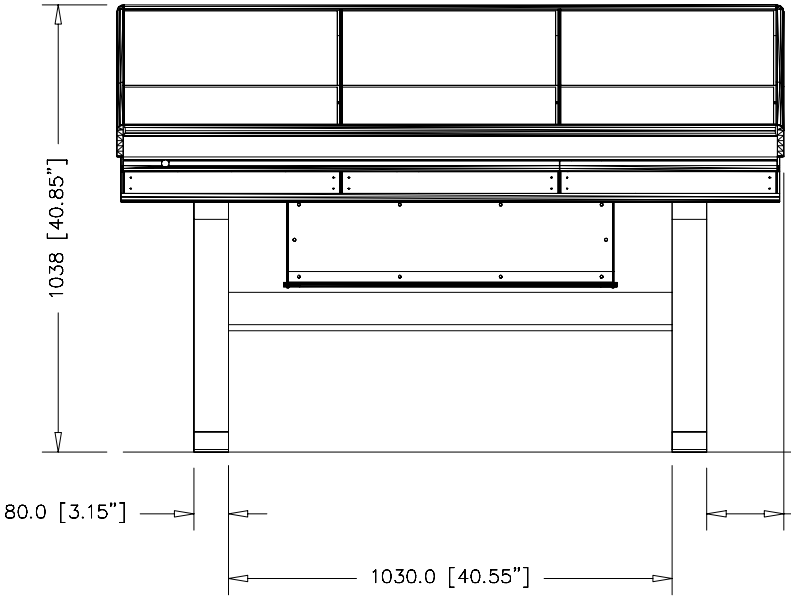
Frame Size	Length		Depth	
	inches	mm	inches	mm
4:4:4 Frame	60.9	1547	38	964
4:5:4 Frame	65.83	1672	38	964
4:4:4:4 Frame	80.83	2053	38	964
4:4:5:4 Fader Frame	85.75	2178	38	964
4:4:4:4:4 Frame	100.8	2559	38	964

END ELEVATION DIMENSIONS

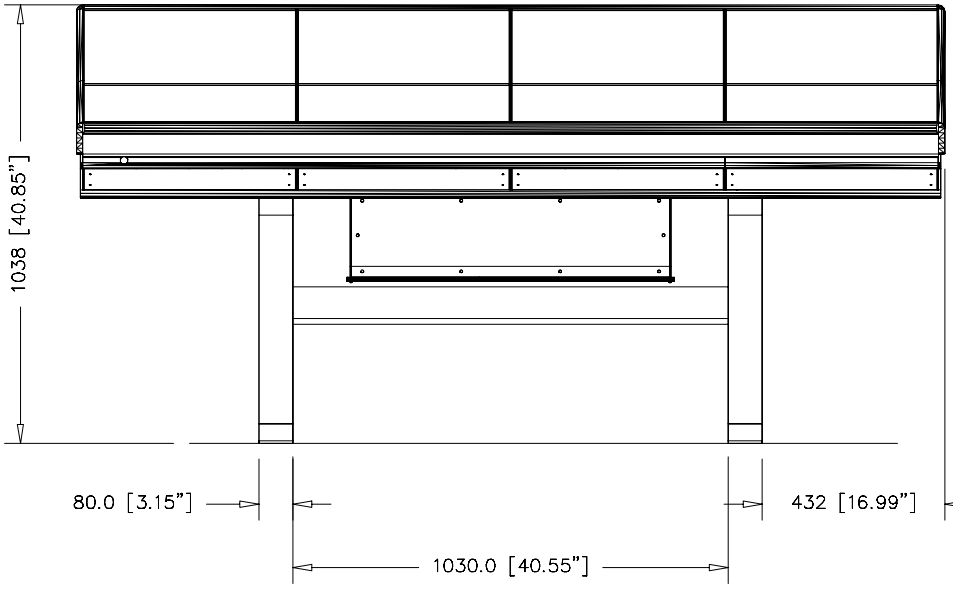


The end elevation dimensions are the same for all frame sizes. The control surface can be seperated from the stand for access to the premises. The control surface sections can also be split apart if required.

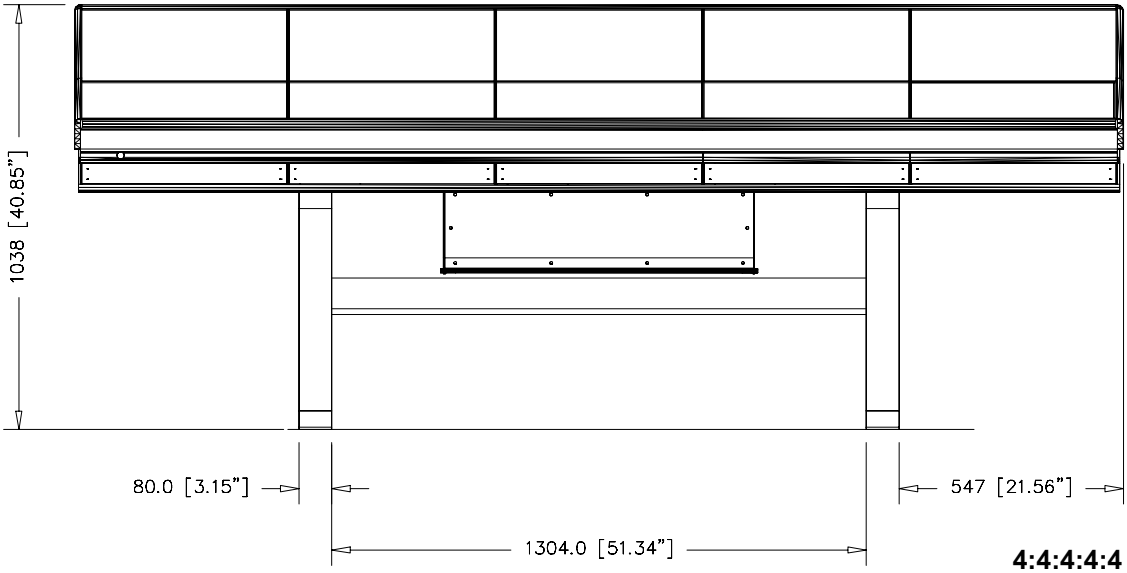
FRONT ELEVATION DIMENSIONS



4:4:4 Frame



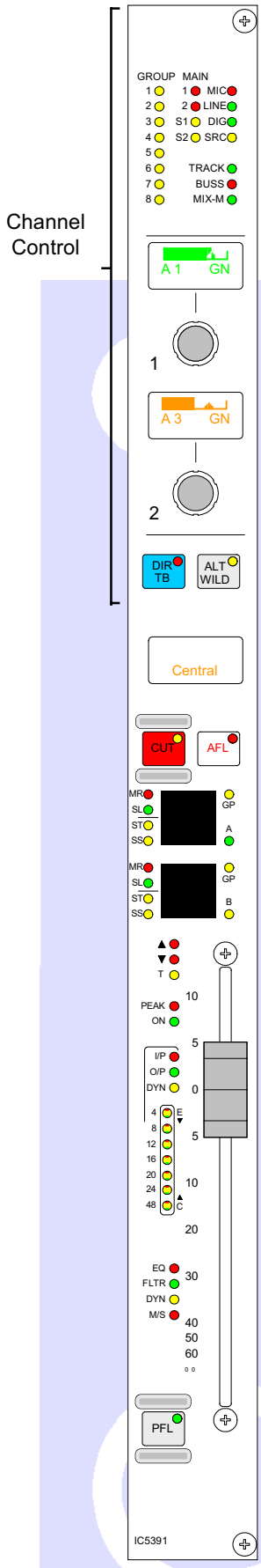
4:4:4:4 Frame



4:4:4:4:4 Frame

Fader Area

"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. Main Output paths have their own dedicated faders on the Routing, Aux and Main Outputs panel.

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. If path A is active, it's label will be displayed in the top half of the display in green. If path B is active, it's label will be displayed in the bottom half of the display in 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 preferreble, the CUT buttons can be replaced with ON buttons which switch the channel on.

The MR & SL LED's next to the Assign buttons indicate the masters and slaves of a VCA style group.

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

The ST & GP LED's next to the Assign buttons indicate Stereo Channels (ST) or Groups and Group Faders (GP).

The fader bargraph indicates the level at the channel input (post the input gain & switching and the tone switching), the channel direct output, or the gain reduction of the dynamics, indicated by the three led's. Selection is made using the screens.

The ∧ and ∨ led's are normally off. They will only illuminate when the position of the fader knob is not the same as the level of the audio. For example, if a VCA Master is moved away from the `0' position, the null leds on the slaves will light. When illuminated they indicate whether the audio is above or below the position of the knob.

The T LED indicates that the console has recognised that the fader has been touched.

The PEAK led will light if the channel, main or group signal is within 3 dB of the clipping level.

The EQ, FLTR, DYN and M/S leds indicate that these functions are active.

The ON led lights when the audio level is not at the ∞ position.

PFL is provided on the fader overpress and on the button. It will be heard on the small LS (or the main LS if PFL to Mon is selected via the PC).

"CHANNEL" CONTROL

The "Channel Control" section is situated directly above the channel fader section.
A set of LED's provide indication of :

- Routing to groups and mains
- The currently selected input type (Mic, Analogue Line, or Digital)
- If the Sample Rate Convertor (SRC) is switched in (for AES inputs)
- Routing to any track
- Whether the Direct output is feeding the Mix Minus buss
- Whether the Direct output is being fed with a Mix Minus feed

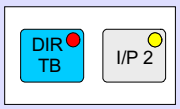
This section houses two WILD controls per fader. Almost any Assign Panel rotary control for the selected path can be assigned to either Wild Control on the fader, including:

- Input Gain
- Dynamics
- Direct Output Level
- Stereo Width
- Aux Send Level
- EQ
- Pan and Balance
- Track Output Level

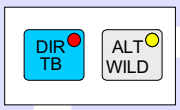
The A & B faders may also be assigned to a Wild control, in which case it will be the opposite fader which is being controlled.

Available Options

Depending on the options purchased, the button next to DIR TB can perform different functions.

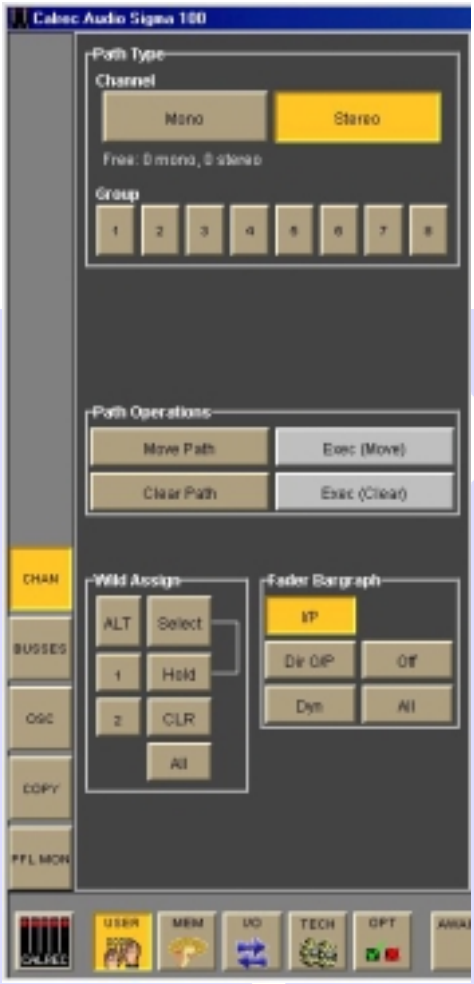


Option 1
Each channel path can select between two input ports using the I/P 2 button. With the LED off, Input 1 is selected, and with the LED on, Input 2 is selected.



Option 2
The ALT WILD button allows switching between two complete sets of alternate wild settings. This would then allow up to 4 available wild controls per fader.

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), or select the path using the screen.

2) Select WILD ASSIGN 1 or 2 on the Channel Functions 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, select 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.

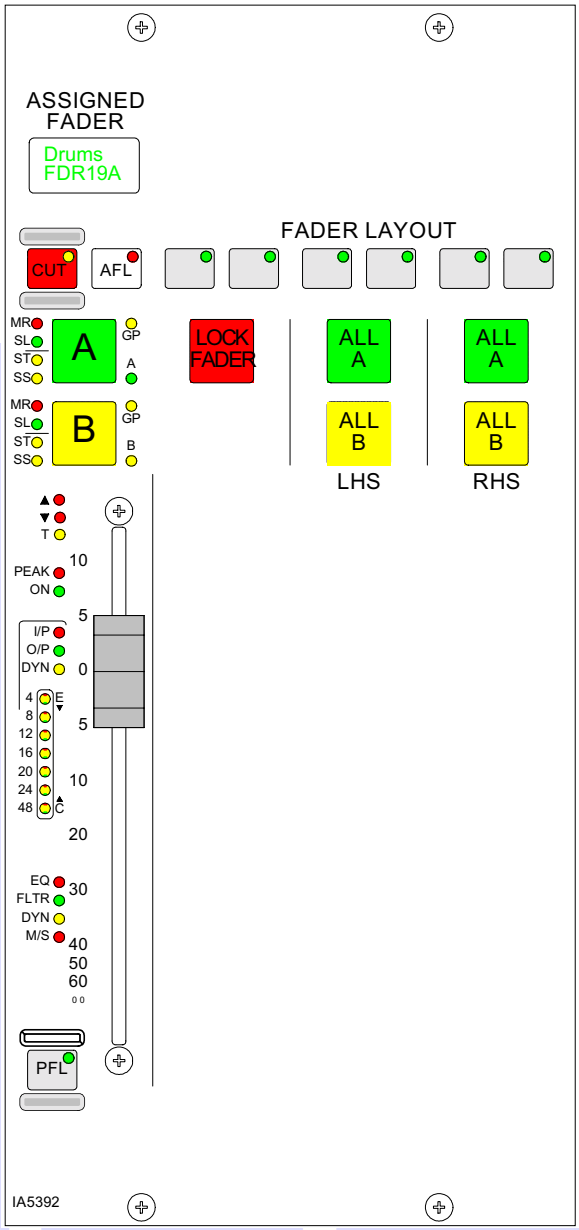
It is possible to assign the same control to Wilds 1 or 2 for all fader paths by selecting ALL before pushing the required Assign Panel rotary control.

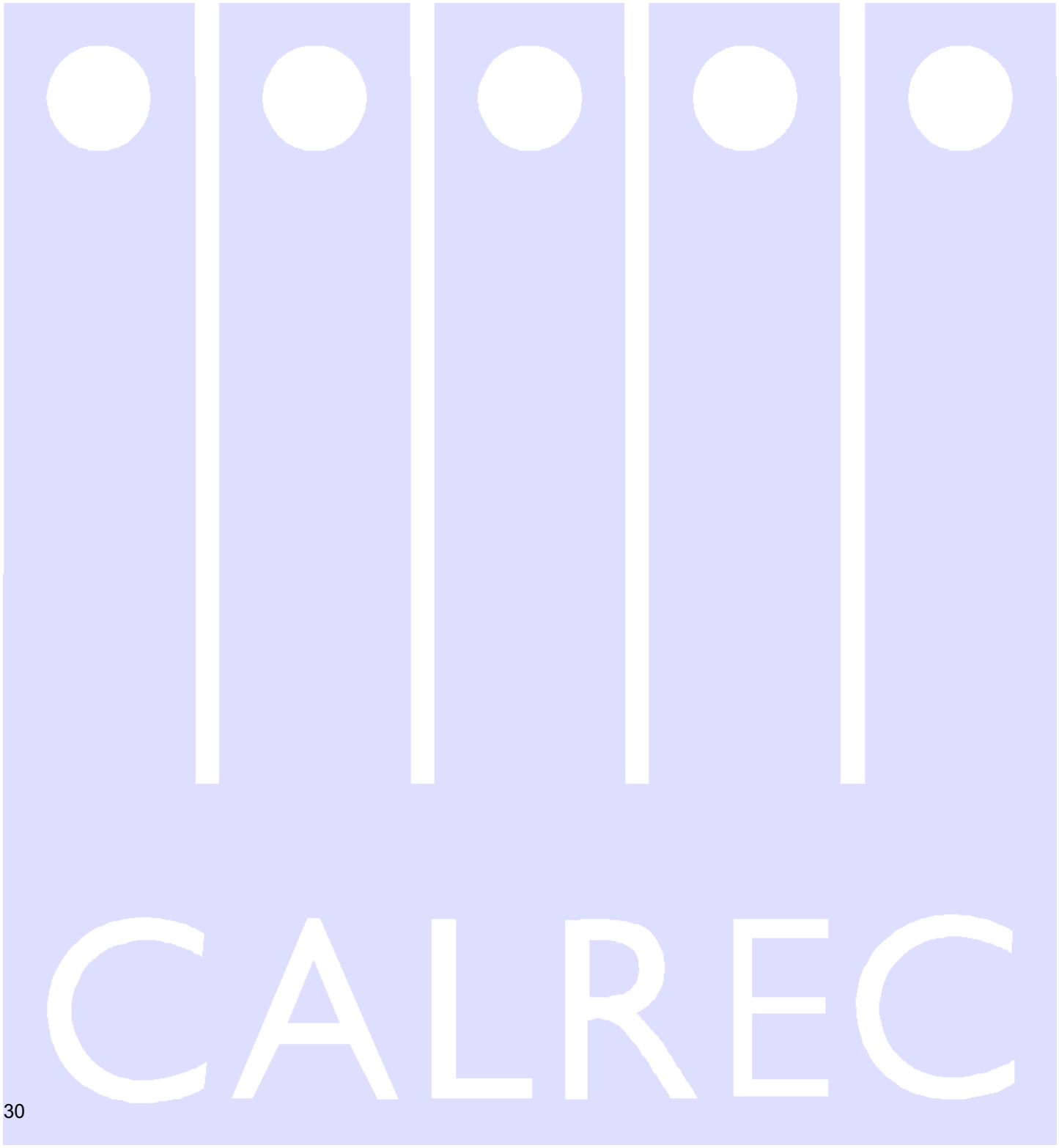
CLR will clear the selected Wild control from it's assignment.

ASSIGNABLE FADER

The Assignable Fader is positioned towards the centre of the console, and allows any fader to be controlled from the optimum listening position. It works in parallel with the last "Channel" Fader selected.

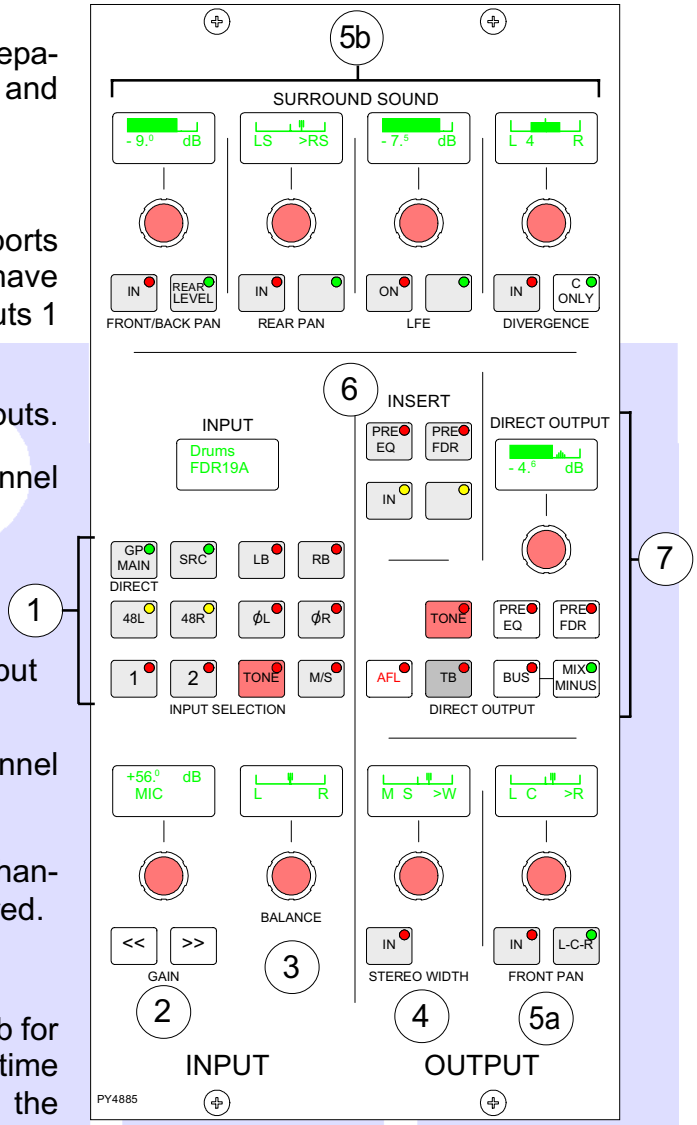
Alternatively, LOCK FADER allows it to be fixed to a specific path.




CALREC

Assign Panels

INPUT/OUTPUT CONTROLS



The input controls in the Input/Output section allow separate settings for the two channel inputs, and gain and ON/OFF for the group and main direct inputs.

(1) Input Settings

Each channel path can switch between two input ports using buttons 1 and 2. Optionally, each fader can have a dedicated selection button to select between inputs 1 and 2 on its channel control module.

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.

(2) 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 0dB. 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 AES inputs, and ∞ to +10dB for direct inputs.

(3) Balance Control

Operates on stereo channels only. When LB & RB are selected, the balance control acts as an input pan control.

(4) Width Control

Operates pre fader on stereo channels and groups. The rotary control adjusts the width from mono, through stereo, to wide. The control is switched in and out of the path using the IN button.

(5a & 5b) Stereo and Surround Panning

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 monitoring is surround.

The Front Pan allows the front signal to be panned from left, through center, to right. On stereo channels and groups, the L-R PAN acts as a balance control.

The Front/Back pan control pans the signal between front and back. When Rear Level is selected, the level to the rear only can be controlled. This allows signal to be fed to the rear without affecting the balance of the mix in the front speakers. Also, the front signal can be turned off and a level set to the rear which is different to that being sent to any stereo groups or mains which the path is feeding.

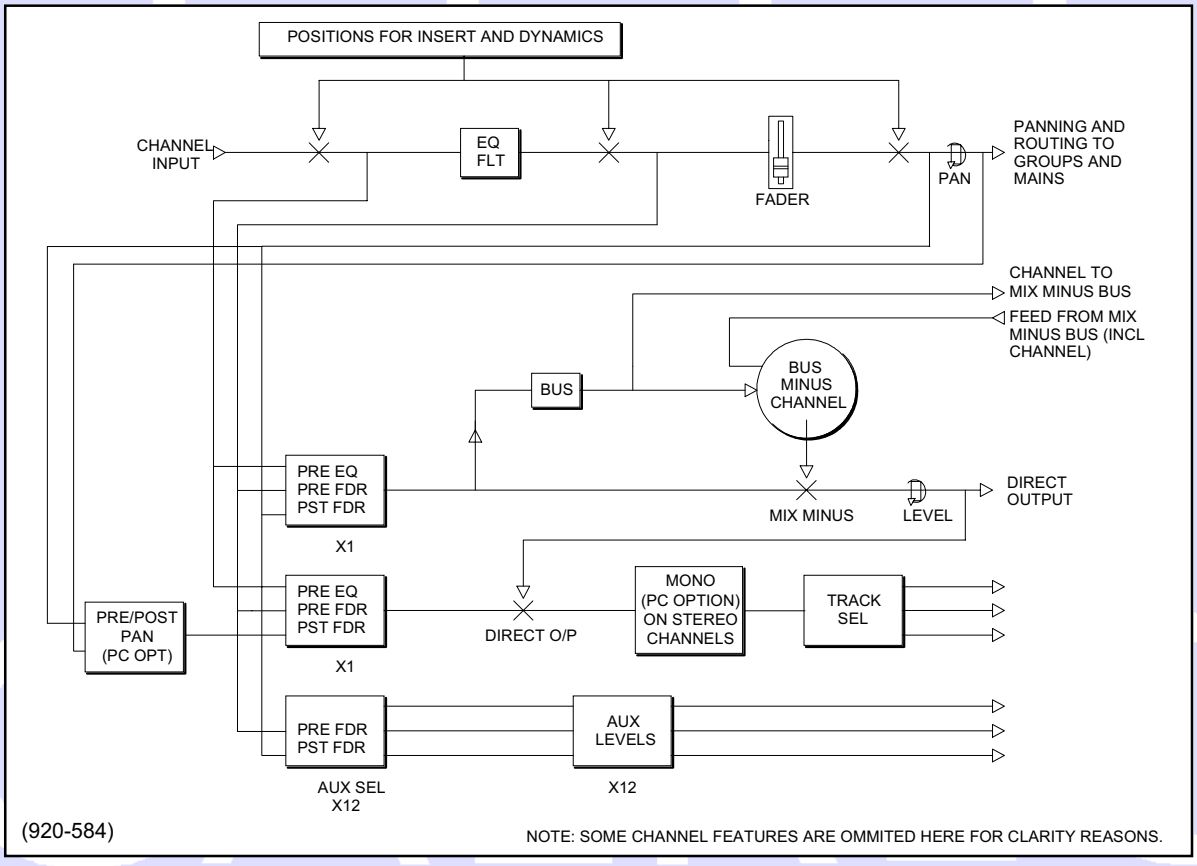
The DIVERGENCE control sets an amount of the centre signal to also feed L & R. Divergence does not operate on stereo channels and groups. The C ONLY button connects the channel output to the centre bus only. All other panning controls are disabled. The channel is fed to both L & R of stereo busses. On stereo channels and groups, C ONLY feeds a mono reduction of the stereo signal to the centre bus only.

(6) Inserts

Assignable inserts can be patched in and out of the channel path using the IN button. The buttons allow the insert to be patched pre or post fader or pre EQ. Assignable inserts must first be set up using the optional I-O Matrix panel (if fitted) or I-O screens (see page 11).

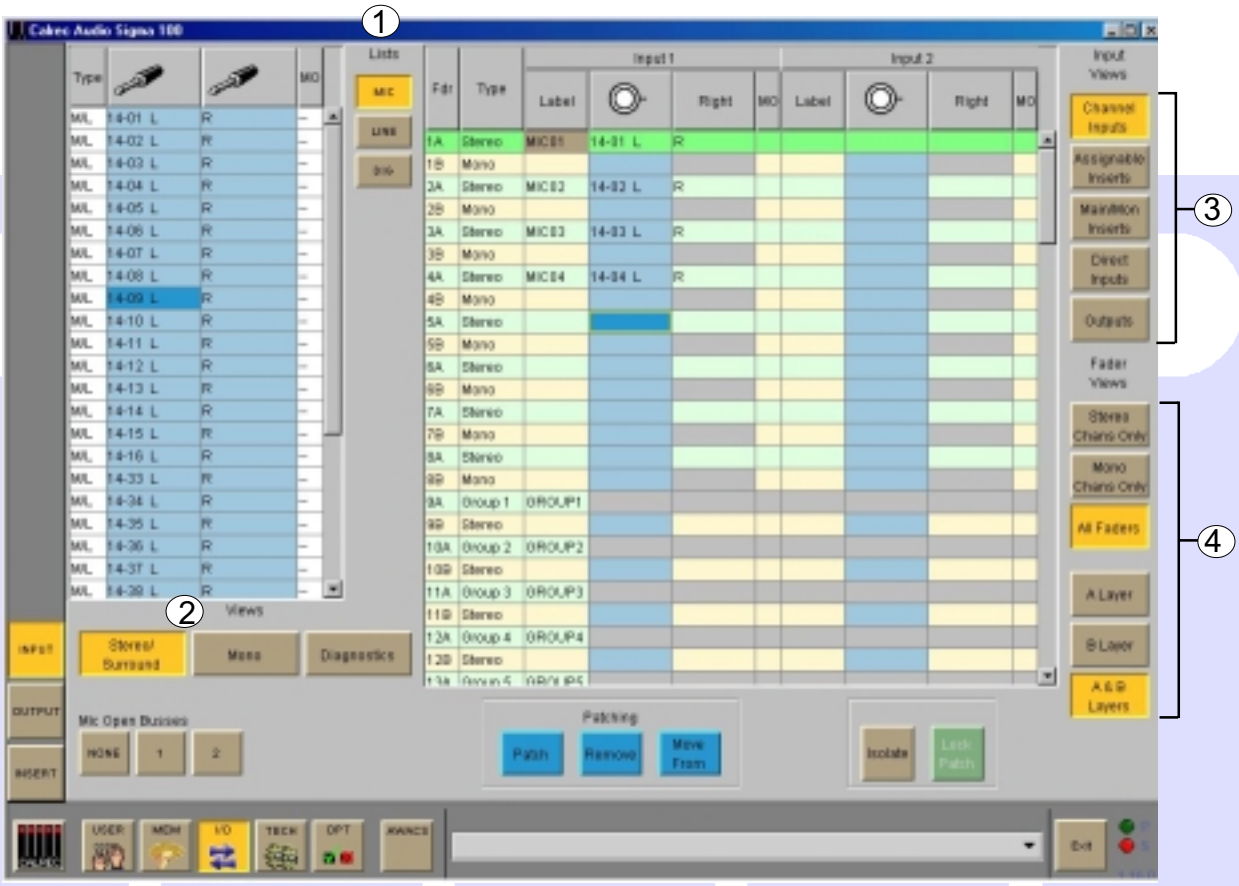
(7) Direct Output and Mix Minus

In the Direct Output section, BUS feeds the Direct Output signal to the Mix Minus Bus. The output of the Mix Minus Bus feeds back into the channel (or group) 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.



INPUT PORTS SCREEN

Path types and the assignment of sources to channels are set via the PC. As an option, the Sigma 100 can incorporate an Input/Output Selection panel (I-O Matrix), so that changes can be made from the control surface.



This screen is the Input Ports Screen and is used for “patching” input sources to channel inputs, Insert Returns, Direct Inputs or 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.

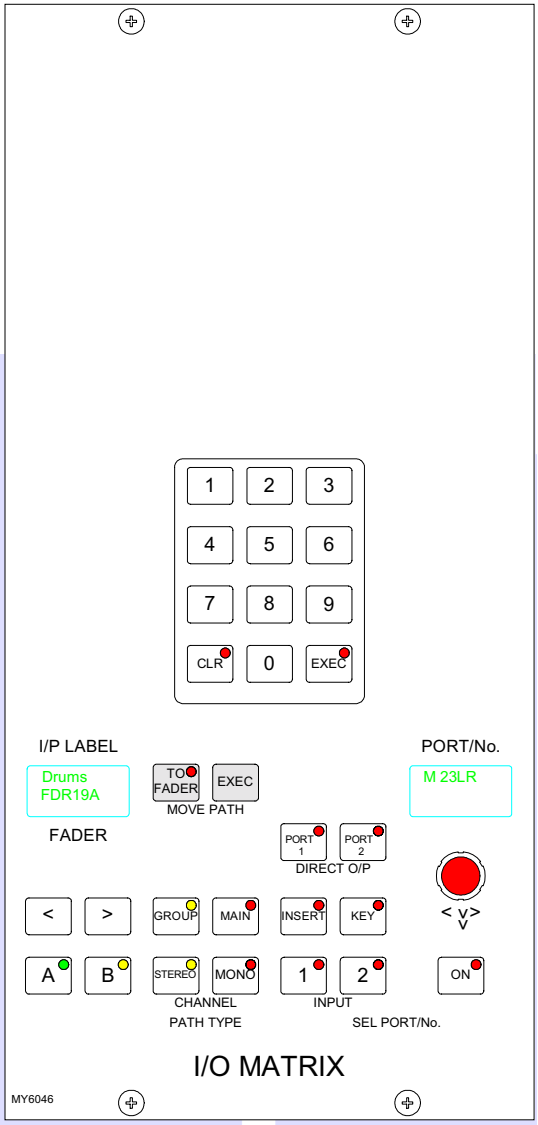
(2) The sources can be viewed as pairs (best for patching to stereo or surround paths), individual (best for patching to mono paths), or individual with the actual rack number, card slot and input shown (for diagnostic purposes).

(3) These buttons select the different console path types which can have input ports attached (Channel Inputs, Insert Returns, Direct Inputs or 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 or output, then selecting PATCH will assign that source to the channel.

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

I/O MATRIX (OPTIONAL)

The I/O Matrix panel is available as an option. It provides a set of I/O controls on the control surface in addition to those on the screens.



Port Assignment

- Press 1 or 2 to select an input.
- Use the rotary control to scroll through the lists of available ports.
- Upon reaching the desired input port, press the ON button to assign the chosen input port to input 1 or 2.

Lists

Pressing and turning the rotary control gives access to lists of other types of input port which are set up during installation of the console. Each port can be allocated to one of a number of lists to allow I/O which is wired for similar purposes to be grouped together for selection. It is possible to determine which lists of input ports appear for selection on the I/O Matrix Panel using the Options-Misc screen. Making only the relevant lists available for selection makes it easier to find the port you require.

Path Type Selection

The GROUP, STEREO and MONO Channel buttons select the path type for the currently assigned fader. If the channel is to be a group, it's number is selected using the rotary control & ON button. The channel path type (Mono/Stereo) can also be selected using the USER CHAN screen.

Direct Outputs

Ports can be connected to Channel and Group Direct outputs, first by selecting PORT1 or PORT2, and using the rotary control and ON button to choose and select ports. (Two ports can be connected to each Direct output using this panel).

Inserts

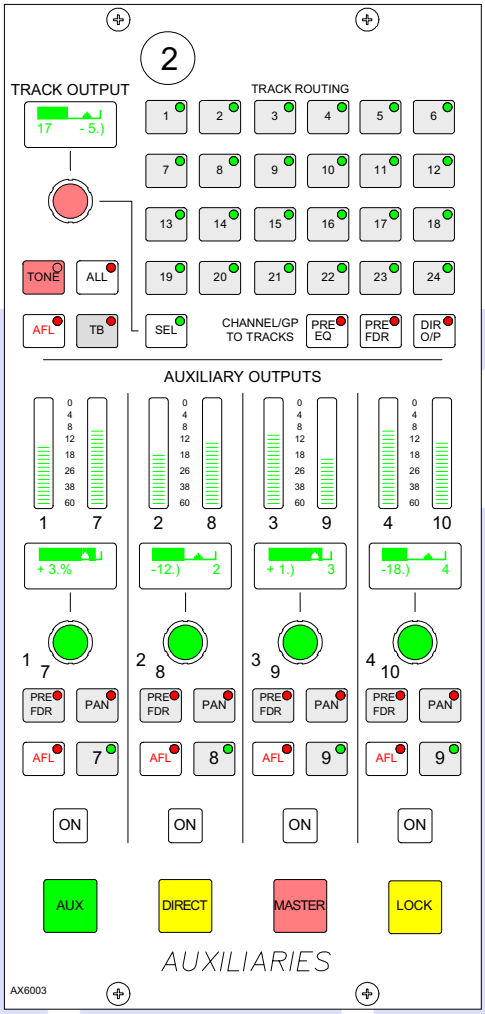
Pressing the INSERT button allows the rotary control and ON button to control selection of inserts on channels and groups. The insert is then switched in and out of the signal path using the buttons on the Input-Output panel.

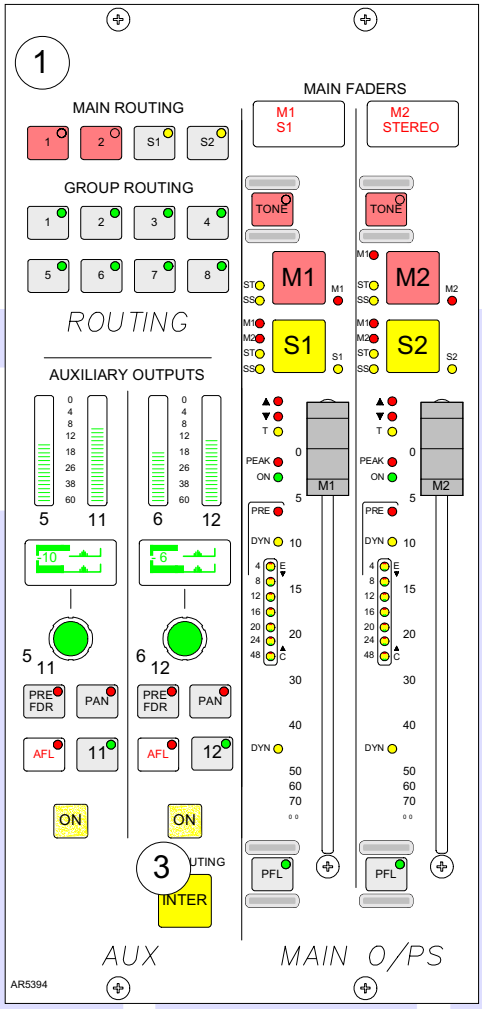
Fader Path Selection

In addition to the Assign buttons on the fader modules (A & B), fader paths can be called to the Assign Panels using the nudge buttons to scroll through the faders, and the A and B buttons choose the path. This is for use when pressing the fader assign button is not convenient, or should a fault develop on the fader strip.

Paths can be moved or swapped from one fader to another, using the MOVE PATH buttons. This function is also available using the USER-CHAN screen.

ROUTING, AUXILLIARIES AND MAIN OUTPUTS





ROUTING

(1) 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 these panels.

(2) The TRACK OUTPUT section controls the output to the multi-track, after the track mix. The 24 track outputs can also be used as IFB or general purpose bus outputs. 24 optional bargraphs can be fitted in the upstand to monitor the output level.

The track output being controlled is selected by pressing SEL plus the required track routing buttons 1-24. ALL makes the control a Master, controlling all the tracks at once.

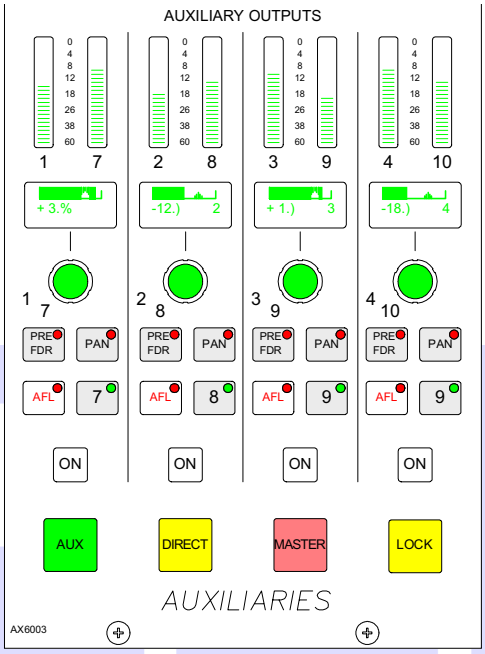
The CHANNEL/GP TO TRACKS section selects the signal feeding the track routing selector to be post-fader (All OFF), pre-EQ, pre-fader or direct output (post the mix minus and direct output level controls - see Channel Schematic on page 33).

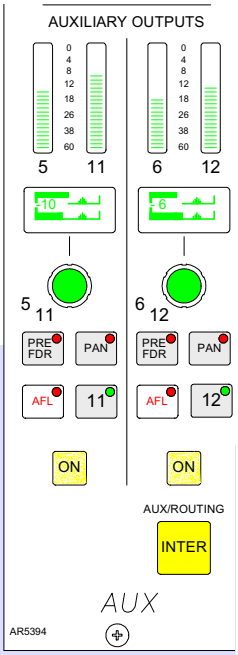
(3) INTER (latching) puts the panel into Interrogate mode. If the main, group or track routing buttons are held down, the fader assign buttons of all the paths feeding that bus will light. Paths can be added or removed from the bus under interrogation, by selecting or de-selecting their fader assign buttons.

AUXILIARIES

The buttons at the bottom of the Auxiliaries section influence the function of the controls.

The displays above each rotary control show what is being controlled (e.g O/P or DIR) until they are adjusted, when the level is then displayed. A short time after the adjustment has been made, the display will show the label again.





AUX When AUX is selected, this section of the module controls the feeds from the channels or groups to the auxiliary output busses. Each feed can be pre or post the channel or group fader.

The ON buttons switch the feed to the auxilliary on.

The Auxilliary buses are pre-set to be mono or stereo via the PC. If, for example, aux 6 is stereo, then aux 12 will not be available (and aux 12 will not work on the monitor selector).

PAN makes the control into a Pan control (balance on Stereo channels). Any pan offset will be shown as an offset between the two bars of the display.

On mono auxiliaries, buttons 7 to 12 switch the control to that numbered aux send. The Pan button will be inoperative.

MASTER When MASTER is selected this section controls the Aux Outputs. On Stereo auxiliaries a dual level display will be shown, For example, aux 5 & 6. Here, buttons 11 & 12 will be disabled. There cannot be a level offset on the output display.

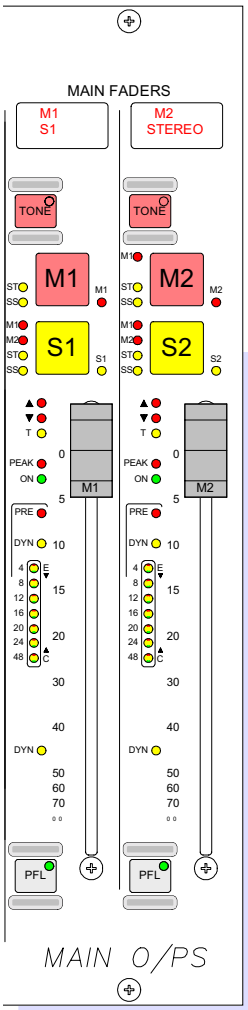
The ON buttons switch the output on and off

LOCK LOCK will lock the panel into output mode. If LOCK is not selected, the panel reverts to Aux if a fader assign button is pressed.

INTER INTER (latching) 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. Paths can be added or removed from the bus under interrogation, by selecting or de-selecting their fader assign buttons.

DIRECT When DIRECT is selected, this section controls the Aux Direct Inputs. The Pre Fader and Pan controls will be in-operative.

MAIN OUTPUTS

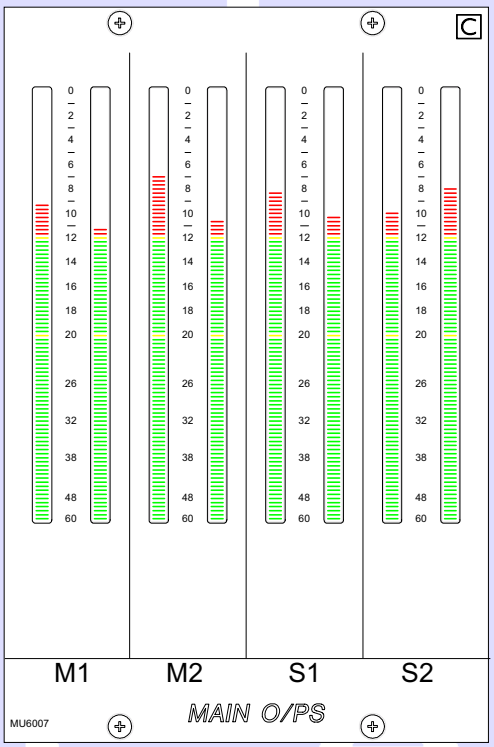


Like channel faders, the main fader design is dual path. Sub-mains 1 and 2 are incorporated under Mains 1 and 2 on a second layer of control.

The ASSIGN buttons (M1, M2, S1, S2) call that output to the Assign Panels to allow; routing (of one Main to another - indicated on the routing leds above the faders), Insert on/off, and control of the Compressor and Direct Input.

Each Main output 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.

If a Surround Main is routed to a Stereo Main, it will be the Stereo downmix which is routed.

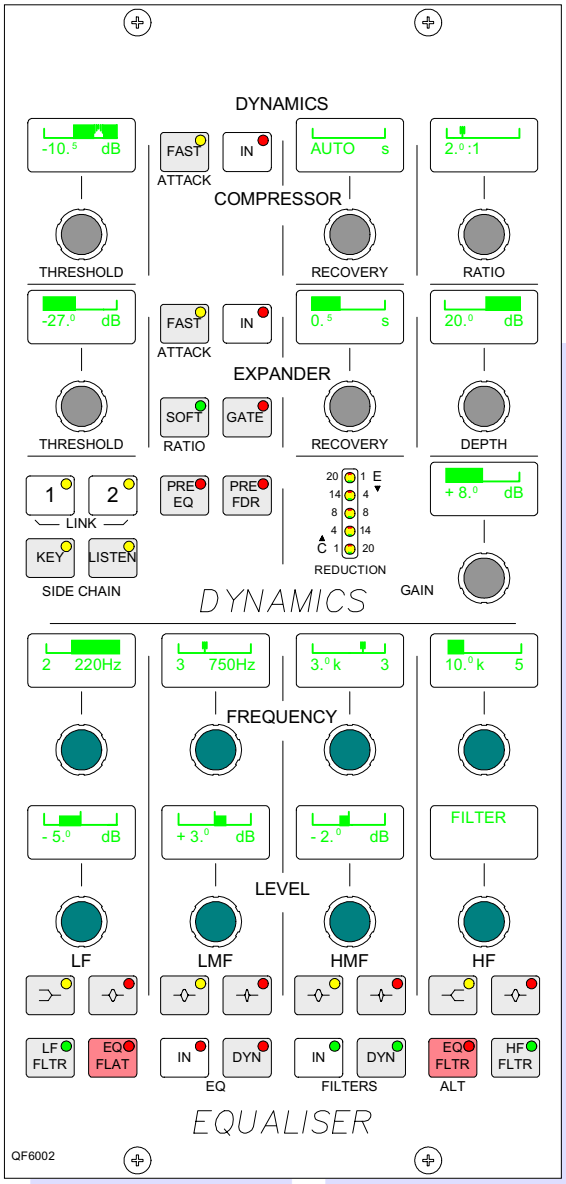


Main Output Meters

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 console, then the meters will display this instead.

DYNAMICS, EQ & FILTERS



The Dynamics section of the module controls the Compressor and Expander/Gate on Channels and Groups, and the Compressor on Main outputs, providing:

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

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

Gate:
Threshold 0dB to -40dB
Recovery 75ms to 4 sec + AUTO
Depth 0dB to 40dB
Fast attack 300µs (normal 16ms)

Make up gain is adjustable from 0dB to +20dB.

EQ & FILTERS

The Equaliser section of the module controls EQ & Filters on the Channels. ALT EQ FLTR allows switching between two complete sets of alternate settings. Excessive control ranges are deliberately avoided to simplify operation.

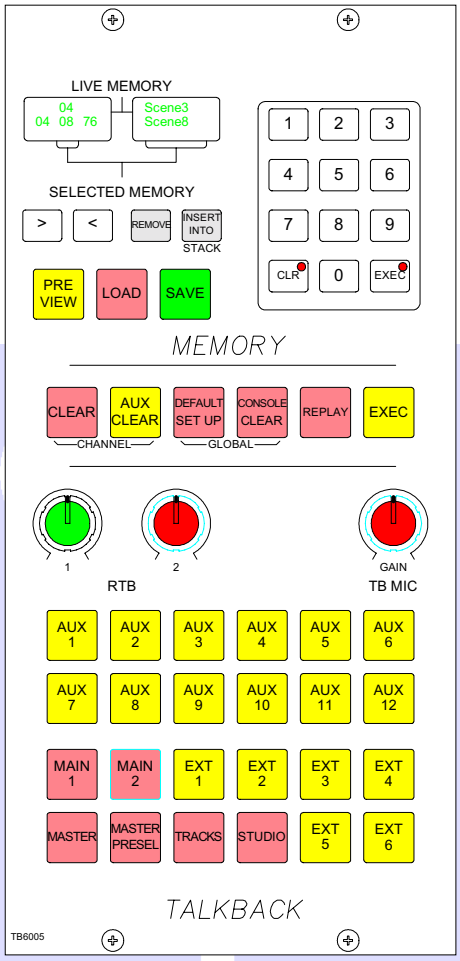
The controls provide:

Filters:
LF 12dB/octave, 20Hz to 330Hz
HF 12dB/octave, 3.3kHz to 20kHz

Equaliser:
LF 30Hz to 470Hz, shelf or bell (Q of 1.5)
LMF 160Hz to 2.4kHz, Q = 1 or High Q = 3
HMF 500Hz to 7.5kHz, Q = 1 or High Q = 3
HF 1kHz to 16kHz, shelf or bell (Q of 1.5)

EQ level controls are ±15dB

MEMORY AND TALKBACK PANEL



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.

The display at the top of the panel shows the “Live Memory” on the top half, and the “Selected Memory” on the bottom half.

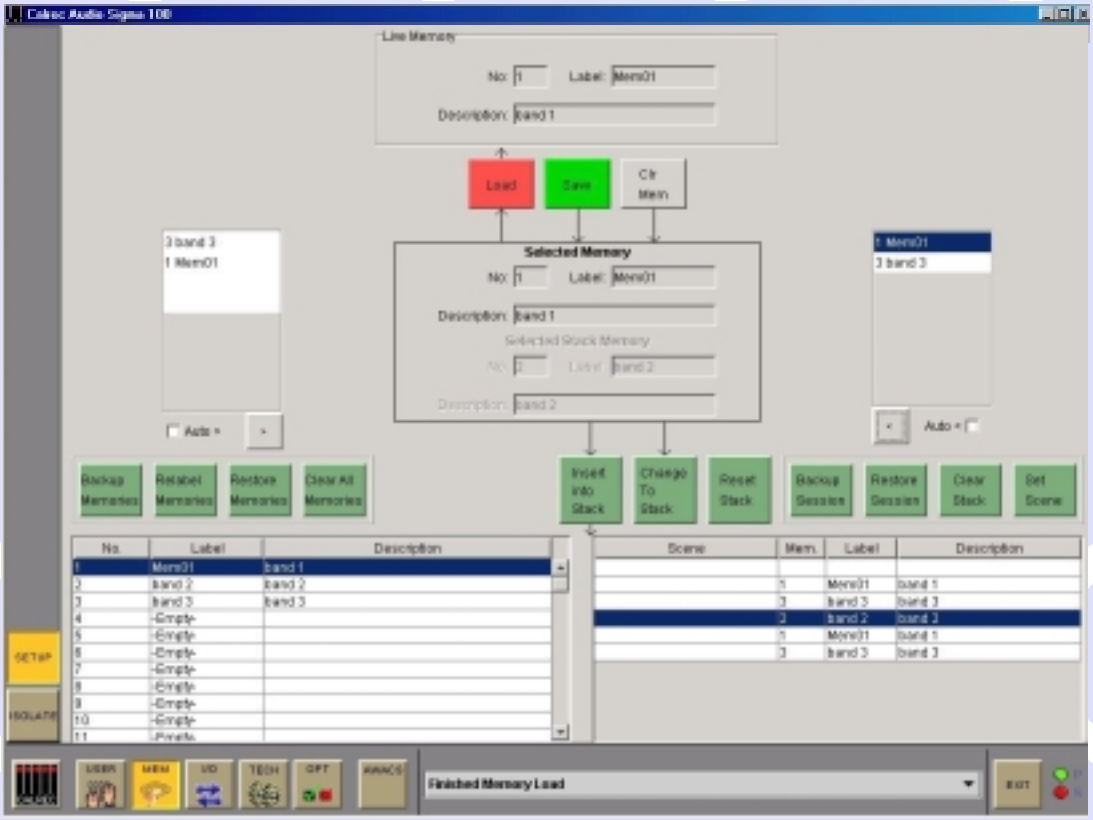
The Live Memory is the current memory loaded onto the console. The buttons in the memory section act on the Selected Memory.

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 previous console settings.

The Selected Memory can be chosen in different ways. The keypad allows any memory number to be called into the Selected Memory position. Enter the two digit memory number followed by EXEC to call up any memory. The Selected Memory can also be chosen by clicking on the required memory in the Flash Rom list on the left of the Memories Screen (below).

The contents of the Selected Memory can be cleared by selecting Clear Memory from the screen.



The SAVE button will save console settings to the Selected Memory. Therefore, the memory to which you want to save should be in the Selected Memory position when SAVE is pressed. Alternatively, SAVE + Memory Number + EXEC will save into that memory number.

To create a new memory, choose an empty memory from the list on the left of the Memory screen, either by clicking on it, or by typing it's number on the keypad. If however, you wish to simply update changes you have made to the Live Memory, it must be showing as both the Live Memory and the Selected Memory in the display. The PC can be used to change the title of the memory being saved.

When the Preview button is pressed, the Selected Memory's settings will be displayed on the control surface. The Assign panels' displays will be blanked out. Upon release of the Preview button, the control surface will display the Live Memory again.

STACKED MEMORIES

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 allow the stack to use the Selected Memory position, any memory which has been selected manually, and is not part of the stack (shown in inverse text), must first be removed from the Selected Memory position, by pressing REMOVE.

If REMOVE is pressed while a stack memory occupies the Selected Memory position, it will be removed from the stack. A second press will remove it from the SELECTED MEMORY position.

The > and < buttons scroll through the Stack. Pressing both > and < together, will reset the position so that the last number loaded is back in the central position. To add a memory to the stack, ensure it is in the Selected Memory position, and press INSERT INTO STACK.

AUTO > or < automatically moves the Stack to the next position after each LOAD.

TALKBACK

Talkback is available on this panel to all 12 Auxes, Main 1 and 2, 6 external sources (via relay switching), All Tracks, and Studio. In addition, the MASTER button operates all the TB buttons preselected by the MASTER PRESEL button.

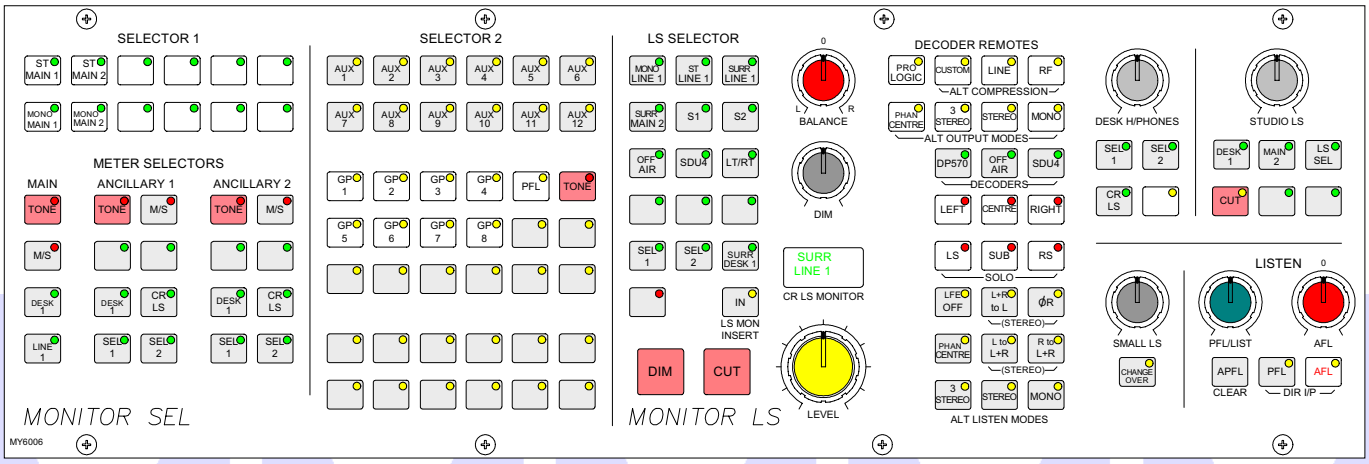
Talkback is also available using the buttons on the fader modules, Input/Output panel and Track routing panel, to Direct Outputs and individual tracks.

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

The GAIN control can set the level of the TB Mic.

2 rotary controls can set the level of 2 RTB (Reverse Talkback) signals. Each RTB signal can feed a separate loudspeaker. There can also be a mix of both signals to feed a single loudspeaker. This can mix with the PFL feed.

MONITOR SELECTOR & LS PANEL



The Monitor and Meter Selectors are used to select the source to monitor, and what to display on the meters. If the LS system is Surround, Stereo and Mono sources will still be heard in Stereo and Mono, with no signals on the other speakers. Selectors 1 & 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.

If a surround signal is monitored on a stereo LS or Meter, a stereo downmix will be created and monitored. 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.

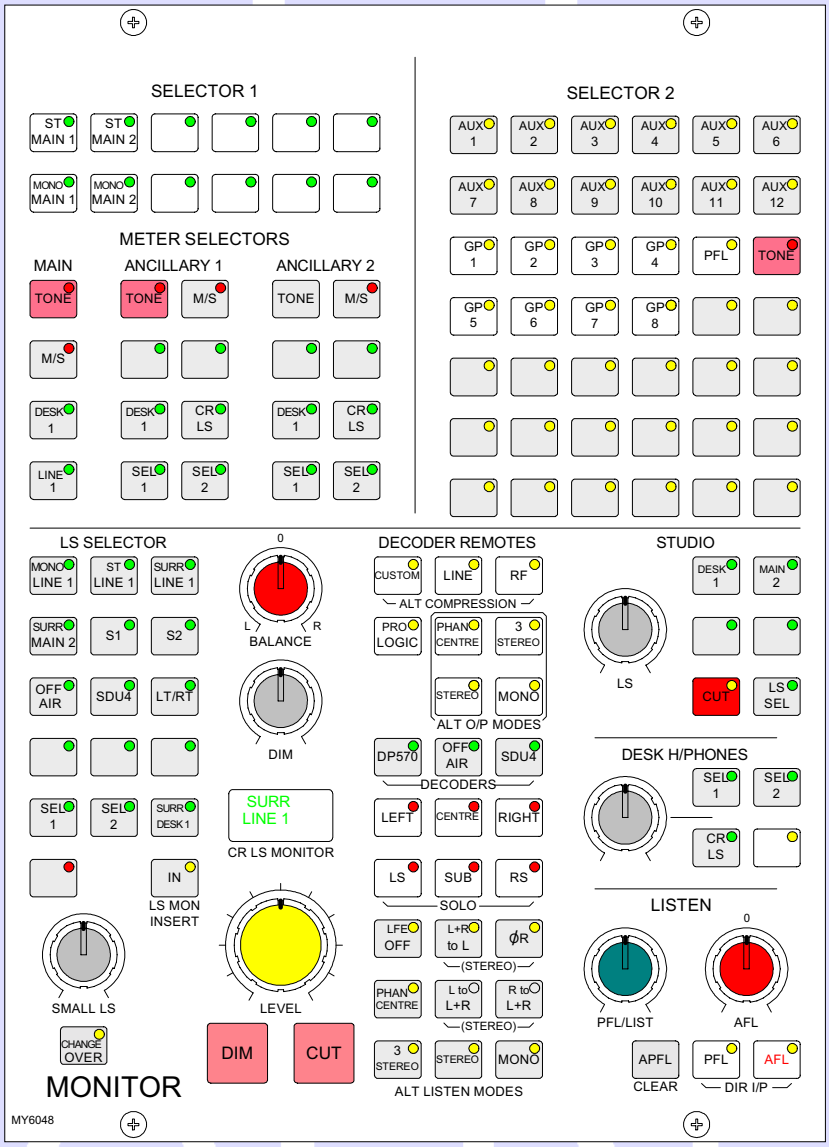
PFL from Surround Mains is a stereo downmix of the surround signal.

The DECODER REMOTE buttons control whichever Decoder is currently selected. (Other Decoders remain in their previously set state). The buttons are shown engraved for a Dolby DP570.

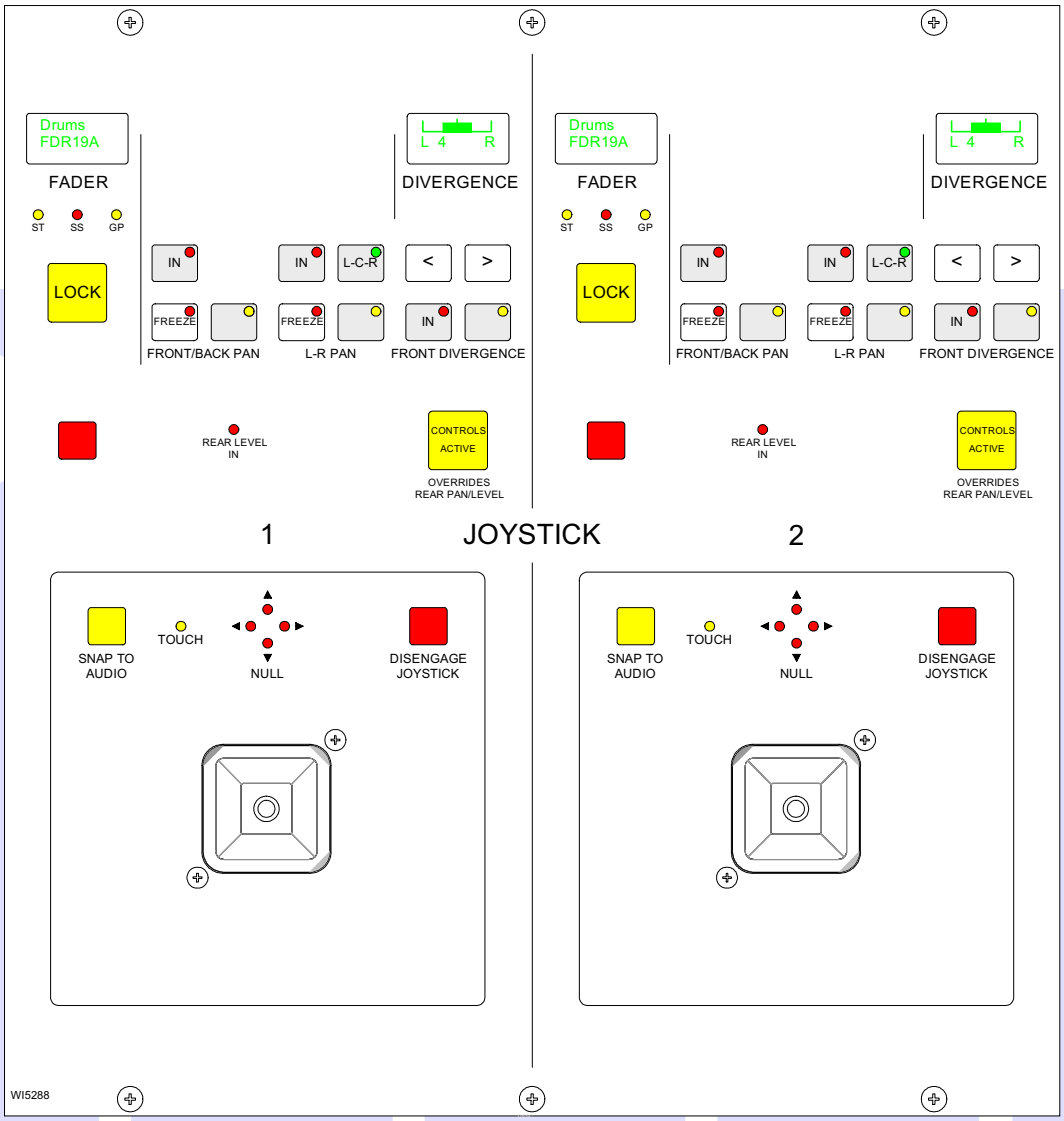
- 4 buttons for Alternate Output Modes (all off indicates Full Surround).
- 3 buttons for Alternate Compression Modes (all off = no compression and no dialogue normalisation).
- 1 button for Pro Logic mode. It is assumed that the DP570 will be set on the unit, to Dolby Digital mode either in manual or auto detect mode.
- When controlling a Dolby SDU4, LT/RT decoder, only the Stereo and Mono, Output Mode buttons will function.

For STUDIO LS, two parallel LS outputs are provided, post the level control, with separate MIC OPEN cuts. These can be independently either Stereo, 3 Stereo or 5.1.

The Monitor Selector & LS panel is also available in portrait style. This allows channel faders to be placed in the centre section of the console.



MOTORISED JOYSTICK PANEL (OPTIONAL)



The joystick panel is available as an option, and can be either a single joystick, or twin joysticks as shown above.

The joysticks are touch-sensitive, and the TOUCH LED will light when the joystick is touched. In normal operation, the joystick controls the currently selected fader path (Chosen by pressing A or B on the fader panel). LOCK allows the joystick to be fixed to a specific path. Pressing LOCK again will unlock the panel. The fader display shows the path currently assigned to the joystick panel.

LEDs show the type of path being controlled:

SS - Indicates a surround sound main (no control available).
ST - Indicates a stereo path.
GP - Indicates a group.

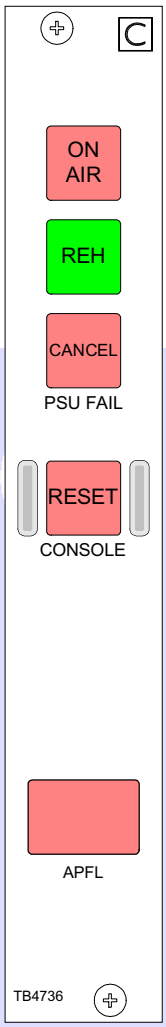
Front/Back pan, L/R Pan and Front Divergence each have a set of dedicated controls. Each has an IN button to enable the function. The IN buttons and L-C-R button work in parallel with the buttons on the Input/Output panel. The blank buttons are there so that additional features can be implemented in the future.

CONTROLS ACTIVE must be selected for the joystick controls to take effect. When Controls Active is selected, the joystick moves to the position set by the Front Pan and F-B controls (including IN/OUT status). If the joystick is being touched when Controls Active is selected, then the audio will move to the position of the joystick. Any Rear Pan and Rear Level settings are disabled, and the Rear Pan and Rear Level displays on the Input/Output panel and any Wild Controls show "JOYSTK". De-selecting Controls Active does not restore any previous Rear Level or Rear Pan controls, but leaves the Rear Level switched out, and the Rear Pan at the same setting and IN/OUT status as the Front Pan.

If a blank fader or a Main path is assigned, Controls Active is disabled. The divergence display will be blank and the buttons should be all off. If the joystick is engaged, it will default to the central position, unless it is being touched, in which case it will stay where it is. Similarly, if a path is assigned where Controls Active is off, the joystick (if engaged) will default to the central position, unless it is being touched, in which case it will stay where it is.

FREEZE	:	When freeze is pressed on either axis, the joystick ceases to alter that axis. Freeze does not affect the Input/Output panel or Wild controls, they can still alter the frozen axis. The null LEDs show which direction the joystick must be moved to match the audio.
DISENGAGE	:	Disengages the joystick only. When the joystick is disengaged, it does not control or move to follow the audio. This is to protect against accidental changes. The null LEDs will still indicate the direction in which the joystick must be moved to match the audio. When Disengage is de-selected, the joystick will move to the position of the audio, unless it is being touched, in which case, the audio will move to the position of the joystick.
SNAP TO AUDIO	:	Pressing this button will cause the joystick to snap to the position of the audio.

BROADCAST FACILITIES PANEL



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 or from external inputs set up on the OPTO screen.

The OPTIONS-TX REH screen allows the condition switching for the system to be set up. 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, 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 the hot spare will take over should a fault develop. 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.

AUTOMATIC WARNING & CORRECTION SYSTEM

If a problem does develop, the PC will flash the icon of the Automatic Warning and Correction System (AWACS) screen where error messages are reported.

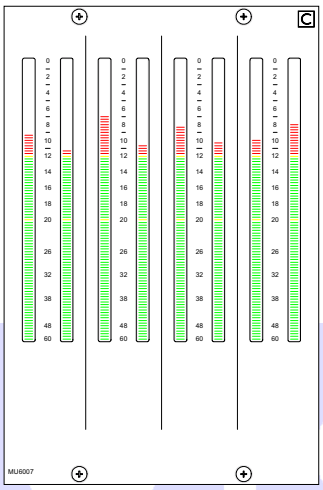
Because the system has many back-up features, such as automatic change over to hot spares for PSU's, Control cards & DSP cards, it is possible to continue operating after errors are reported. Message history is saved to the PC's hard disk for future analysis.

Console Reset

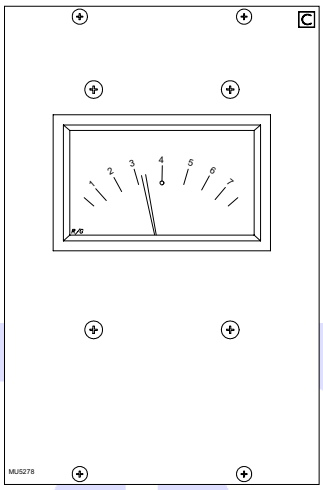
Pressing the CONSOLE RESET button resets the Control System only. Independent DSP operation ensures audio continuity during console reset. The most recent console settings will be fully restored in less than 15 seconds.

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.

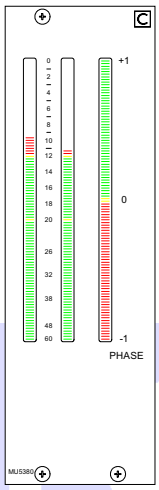
METERING OPTIONS



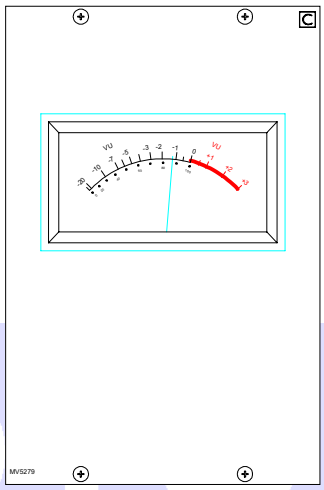
4 x Twin Bargraph



PPM Meter R/G (A/B)



Phase Meter Bargraph & Stereo Bargraph



VU Meter

The MAIN and ANCILLARY 1 meters can 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 display incorporating bargraphs, or a mixture of these.

The Main meters are fed from the Main meter selector which is on the Monitor Selector panel. It can select either Main 1 or 2 Desk (pre Tone & TB), Main 1 or 2 Line (which can be an external input), or Tone.

In addition to the Main and Ancillary 1 meters, a comprehensive set of optional meters are available:

- 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 and is in surround. The APFL meter will display the stereo downmix of these signals.
- MIX MINUS: Single bargraph displaying signal on the mix minus bus (Mono).
- GROUPS: 8 stereo bargraphs for the groups. For mono groups, the meter will display the eft bar only.

Calrec can supply either bargraphs, Moving Coil VU or PPM meters. (except for the Aux output meters, which are always bargraphs). All meters in the meter bridge, including moving coil types, are fed directly from the meter processor, except for any Phase Displays which will require audio outputs from the I/O Rack.

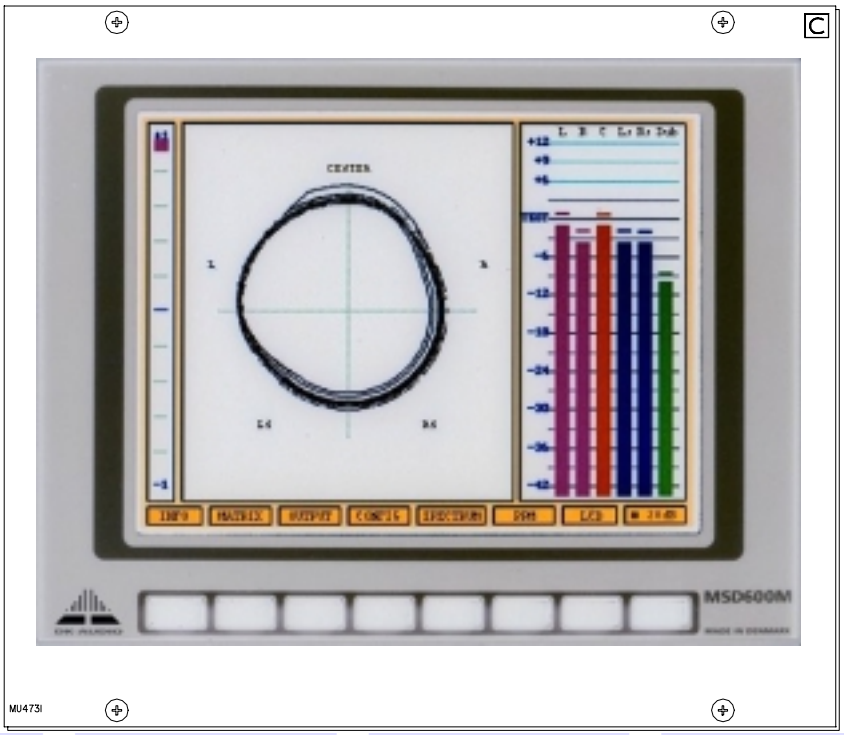
Calrec bargraphs provide a bar which can be either VU or PPM. In addition, there can be a True Peak spot (which incorporates a long release time). Together, these allow the operator to see the level of the signal using a familiar meter and at the same time to see how close the peaks of the signal are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

The bargraphs can have 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.

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.

OPTIONAL THIRD PARTY METERING

It is possible to incorporate third party metering options into the Sigma 100 design, such as the DK Audio MSD600M shown here.



Screen Summary

SCREEN USAGE & LAYOUT

Sigma 100 is designed to minimise the need for the operator to use the screen once the console has been preset. The use of menus has been minimised to provide easier and quicker access to the functions and information on the screen. Failure of the screen's computer has no effect on the operation of the control surface or the audio.

The screens are divided into groups which are accessed using the buttons along the bottom of the display. There are groups for:

	User	Operational screens which enhance the controls on the console and for setting options which are stored with the memories.
	Mem	Memory control screens to supplement the panel controls.
	I/O	Set up and display of all the I/O connections stored with the memories.
	Tech	Entry to and control of password-protected operational modes, trouble-shooting screens.
	Opt	Options screens for pre-set items which are not stored with the memories, such as synchronisation, input headroom and impedance, condition switching and GPI/O settings.

Within each group there are a number of screens accessed by buttons up the left side of the display. On some screens, there are additional buttons to access sub-sets of the screen's function.

The "EXIT" button at the bottom corner of the screen will exit the application. Next to this button are two indicators which show the status of the Primary and Secondary Control Processors. During normal operation, the Primary processor will be in use, and it's indicator will be green. When busy, the processor's indicator will be amber, during which time, no changes will be seen on the control screens, (Although changes to the console's control surface can be made, and will take immediate effect).

OPTIONS SCREENS 

The OPT screens are used to pre-set the system to the studio's required settings. These settings are not stored in the individual console memories but can be saved separately using the OPT - FILE screen. This allows options to be changed without invalidating any saved memories.

MISCELLANEAOUS - Allows setting of input headroom, mic/line input impedance and I/O Matrix list visibility.

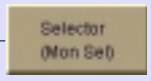
SYNCHRONISATION - Used to pre-set system with up to five external sync sources, plus internal, such that if the 1st source fails, it will switch automatically to the 2nd, and so on.

TX/REH SET UP - This screen allows the condition switching for the system to be set up. Each function can be set to be active, or not, in any of the three states (Transmit, Rehearse or Neither).

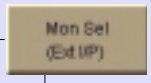
RELAY SET UP - The relay-isolated output connections for various console functions can be assigned here.

OPTO SET UP - The opto-isolated inputs can be assigned to various console functions here.

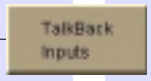
MONITOR INPUT & TALKBACK



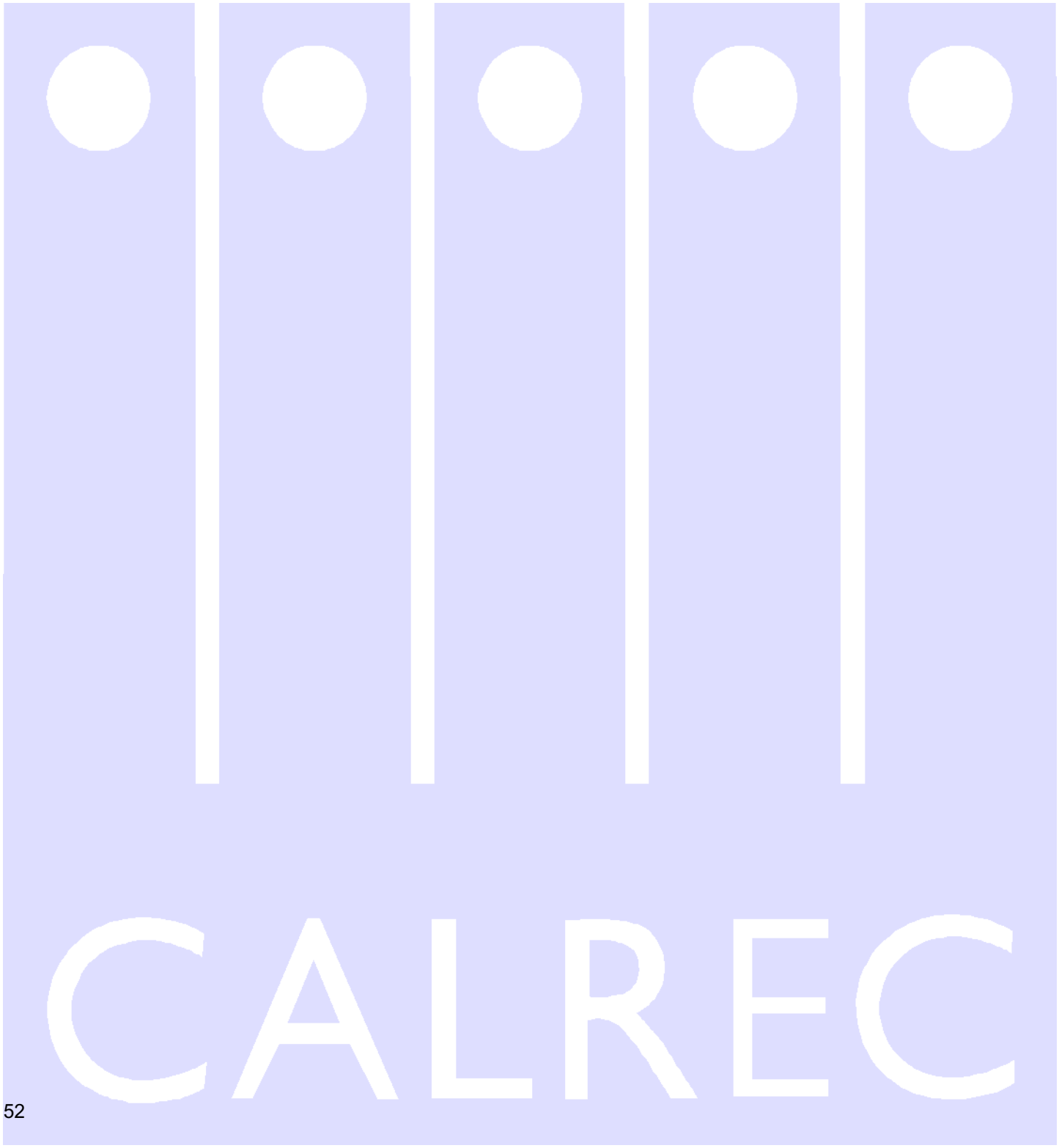
Monitor Buttons View - Gives a confirmation of how the monitor panel buttons have been set up.



External Ports View - The Input Sources for External Monitor Inputs can be patched here in the same way that channel inputs are patched.



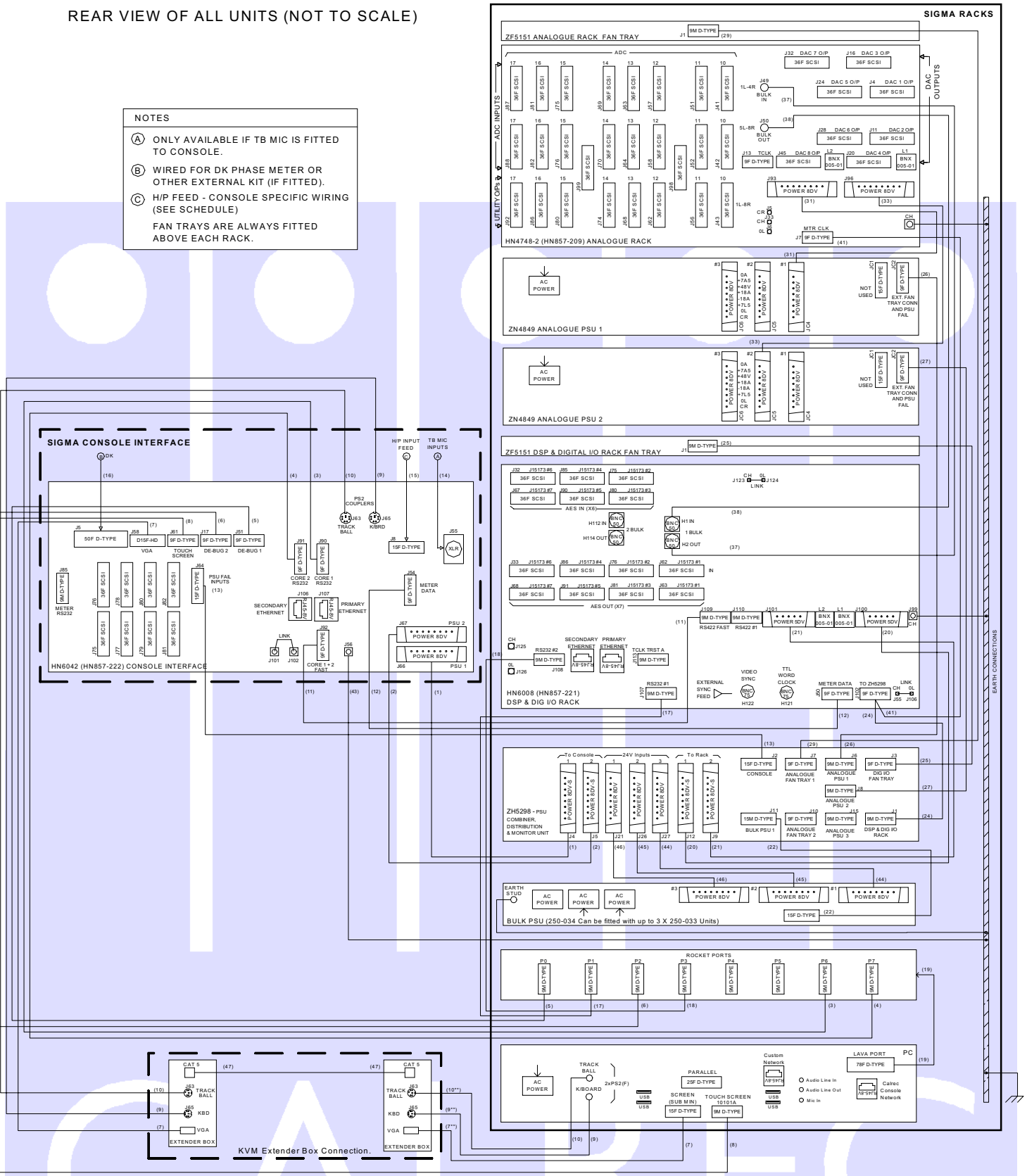
Talkback Ports - The Input Sources for Talkback and Reverse Talkback can be patched here in the same way that channel inputs are patched.


CALREC

Technical Information

CONSOLE & RACK WIRING DIAGRAM

REAR VIEW OF ALL UNITS (NOT TO SCALE)



(0759-22)

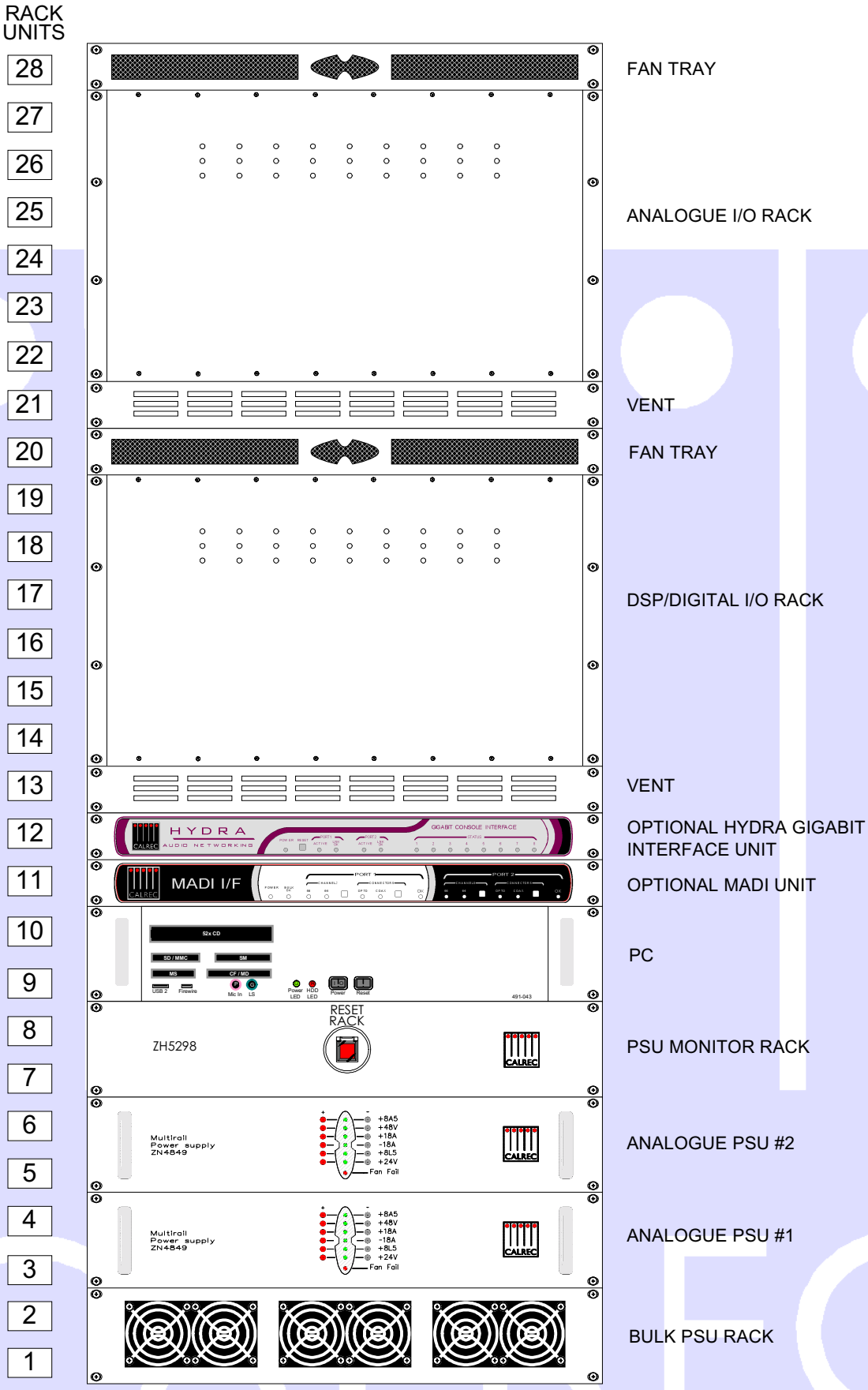
CABLE RUN SCHEDULE

CABLE No	CABLE TYPE	FROM	CONNECTOR	CON TYPE	TO	CONNECTOR	CON TYPE	CIRCUIT	NOTE
1	8C2.5 (310-372)	ZH5298	Desk 1	8way D (M)	HN6042	J66	8way D (F)	Console DC pwr 1	CONSOLE
2	8C2.5 (310-372)	ZH5298	Desk 2	8way D (M)	HN6042	J67	8way D (F)	Console DC pwr 2	CONSOLE
3	BEL5 8135 (310-377)	PC	PORT #6	9way D (F)	HN6042	J90	9way D (F)	Console RS232-1	CONSOLE
4	BEL5 8135 (310-377)	PC	PORT #7	9way D (F)	HN6042	J91	9way D (F)	Console RS232-2	CONSOLE
5	BEL5 8135 (310-377)	PC	PORT #0	9way D (F)	HN6042	J51	9way D(M)	Console debug 1	CONSOLE
6	BEL5 8135 (310-377)	PC	PORT #2	9way D (F)	HN6042	J17	9way D(M)	Console debug 2	CONSOLE
7**	(491-020/1) VGA	PC	SCREEN	15way HD D (M)	HN6042	J58	15way HD D (M)	Console screen	CONSOLE
7	(491-020/1) VGA	PC	SCREEN	15way HD D (M)	Screen Repeater	Screen	15way HD D (M)	Console screen	CONSOLE
8	BEL5 9505 (310-379)	PC	10101A	9way D (F)	HN6042	J61	9way D(M)	C.Touch Screen	CONSOLE
8 **	BEL5 9505 (310-379)	PC	10101A	9way D (F)	Screen Repeater	VGA	9way D(M)	C.Touch Screen	CONSOLE
9	(491-022/3) PS2	PC	KBD	PS2	HN6042	J65	PS2	Console keyboard	CONSOLE
9 **	(491-022/3) PS2	PC	KBD	PS2	Screen Repeater	KBD	PS2	Console keyboard	CONSOLE
10	(491-022/3) PS2	PC	MOUSE	PS2	HN6042	J63	PS2	Console trackball	CONSOLE
10 **	(491-022/3) PS2	PC	MOUSE	PS2	Screen Repeater	MOUSE	PS2	Console keyboard	CONSOLE
11	BEL5 9505 (310-379)	HN6008	J109	9way D (F)	HN6042	J92	9way D(M)	C.RS422 FAST	CONSOLE
12	BEL5 9505 (310-379)	HN6008	J50	9way D (M)	HN6042	J54	9way D(F)	C.Meter Data	CONSOLE
13	DMP10 (310-366)	ZH5298	CONSOLE	15way D (M)	HN6042	J64	15way D (M)	Console PSU fail	CONSOLE
14	PSF4/1 (310-140)	HN4748	???	SCSI 36	HN6042	J51	XLR 3 (F)	C.TB mic out	CONSOLE
15	BEL5 9505 (310-379)	HN4748	???	SCSI 36	HN6042	J18	25way D (M)	Console H/P in	CONSOLE
16	DMP10 (310-366)	HN4748/6008	???	SCSI 36	HN6042	J52	50way D (M)	C.Phase Mtr h	CONSOLE
17	BEL5 8135 (310-377)	HN6008	J107	9way D (F)	PC	PORT #1	9way D (F)	I/O_DSP RS232-1	PC
18	BEL5 8135 (310-377)	HN6008	J108	9way D (F)	PC	PORT #3	9way D (F)	I/O_DSP RS232-2	PC
19	Supplied	Bay PC	PORTS 1-8	8x9way D(M)	PC	Rocket Port	78way HD D (F)	Rocket Port Lead	PC
20	4C2.5 (310-371)	ZH5298	Rack 1	8way D (M)	HN6008	J100	5way D (F)	Digi rack supply 1	I/O_DSP
21	4C2.5 (310-371)	ZH5298	Rack 2	8way D (M)	HN6008	J101	5way D (F)	Digi rack supply 2	I/O_DSP
22	BEL5 9505 (310-379)	Bulk PSU	D1	15way D(M)	ZH5298	BULK PSU	15way D(F)	Racks PSU mon	Pwr Mon
24	BEL2 9502 (310-380)	HN6008	J102	9way D(M)	ZH5298	DIG RACK	9way D(F)	I/O_DSP fan pwr	Pwr Mon
25	BEL2 9502 (310-380)	ZF5151-I/O	D1	9way D (F)	ZH5298	DIG FAN	9way D (M)	I/O_DSP fan pwr/fail mon	Pwr Mon
26 *	BEL2 9502 (310-380)	ZN4849-No.1	EXT FAN	9way D(M)	ZH5298	ANALOGUE PSU 1	9way D(F)	A1 fan pwr / PSU fail	Pwr Mon
27 *	BEL2 9502 (310-380)	ZN4849-No.2	EXT FAN	9way D(M)	ZH5298	ANALOGUE PSU 2	9way D(F)	A2 fan pwr / PSU fail	Pwr Mon
28 *	BEL2 9502 (310-380)	ZN4849-No.3	EXT FAN	9way D(M)	ZH5298	ANALOGUE PSU 3	9way D(F)	A3 fan pwr / PSU fail	Pwr Mon
29 *	BEL2 9502 (310-380)	ZF5151-An1	D1	9way D (F)	ZH5298	ANALOGUE FAN 1	9way D (M)	A1 fan pwr / fail ind	Pwr Mon
30 *	BEL2 9502 (310-380)	ZF5151-An2	D1	9way D (F)	ZH5298	ANALOGUE FAN 2	9way D (M)	A2 fan pwr / fail ind	Pwr Mon
31 *	8C1.5 (310-373)	ZN4849-No.1	O/P 1	8way D (M)	HN4748-No.1	J93	8way D (F)	Analogue PSU 1/1	Analogue Rack 1
32 *	8C1.5 (310-373)	ZN4849-No.2	O/P 1	8way D (M)	HN4748-No.2	J93	8way D (F)	Analogue PSU 2/1	Analogue Rack 2
33 *	8C1.5 (310-373)	ZN4849-No.2	O/P 2	8way D (M)	HN4748-No.1	J96	8way D (F)	Analogue PSU 2/2	Analogue Rack 1
34 *	8C1.5 (310-373)	ZN4849-No.3	O/P 2	8way D (M)	HN4748-No.2	J96	8way D (F)	Analogue PSU 3/2	Analogue Rack 2
35 *	8C1.5 (310-373)	ZN4849-No.2	O/P 2	8way D (M)	HN4748-No.2	J96	8way D (M)	Analogue PSU 1/2	Analogue Rack 2
36 *	8C1.5 (310-373)	ZN4849-No.3	O/P 2	8way D (M)	HN4748-No.1	J96	8way D (F)	Analogue PSU 1/2	Analogue Rack 1
37 *	(312-083) SMB50-1m	HN6008	H2	SMB	HN4748-No.1	J49	SMB	Bulk Link in 1	Analogue Rack 1
38 *	(312-083) SMB50-1m	HN6008	H1	SMB	HN4748-No.1	J50	SMB	Bulk Link out 1	Analogue Rack 1
39 *	COAX 50 Ohm (310-374)	HN6008	H114	SMB 50 (P)	HN4748-No.2	J49	SMB 50 (P)	Bulk Link in 2	Analogue Rack 2
40 *	COAX 50 Ohm (310-374)	HN6008	H112	SMB 50 (P)	HN4748-No.2	J50	SMB 50 (P)	Bulk Link out 2	Analogue Rack 2
41	BEL2 9502 (310-380)	HN6008	J102	9way D(M)	HN4748-No.1	J7	9way D(M)	Analogue Reset	Analogue Rack 1
42	BEL2 9502 (310-380)	HN4748-No.1	J7	9way D(M)	HN4748-No.2	J7	9way D(M)	Analogue Reset	Analogue Rack 2
43	GRN/YEL 6 (310-333)	Eqpt Bay	-	-	Console	-	-	System Earth	CONSOLE
44	8C2.5 (310-372)	Bulk PSU 1	1	8way D (M)	ZH5298	I/P 1	8way D (F)	Bulk Output 1	PWR
45	8C2.5 (310-372)	Bulk PSU 2	1	8way D (M)	ZH5298	I/P 2	8way D (F)	Bulk Output 2	PWR
46	8C2.5 (310-372)	Bulk PSU 3	1	8way D (M)	ZH5298	I/P 3	8way D (F)	Bulk Output 3	PWR
47	Cat 5 (310-391)	PC Extender	Cat 5	RJ45	PC Extender	Cat 5	RJ45	PC Extender CAT 5	-

(0759-4)

* Note: (regarding cables 26 - 42)
on 2 analogue rack / 3 PSU systems fit cable nos 26 - 34, 37 - 42
on 2 analogue rack / 2 PSU systems fit cable nos 26, 27, 29 - 33, 35, 37 - 42
on 1 analogue rack / 2 PSU systems fit cable nos 26, 27, 29, 31, 33, 37, 38 , 41
on 1 analogue rack / 1 PSU systems fit cable nos 26, 29, 31, 37, 38 , 41

TYPICAL RACK LAYOUT



RACK SPECIFICATIONS

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

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

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

MAXIMUM CABLE LENGTHS

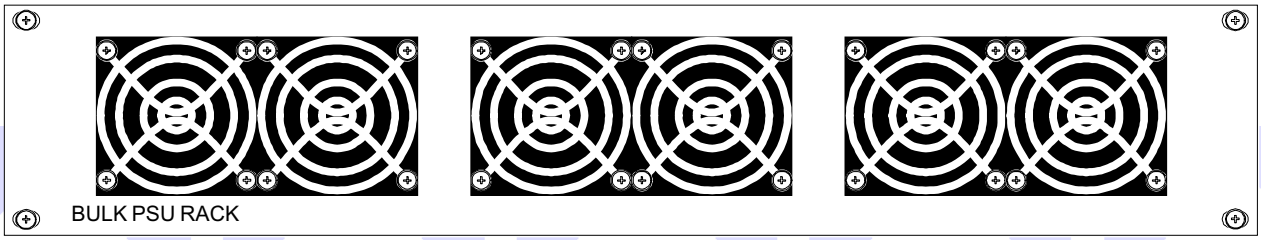
Cables from	To	Maximum length	
		feet	metres
Control surface	Control Surface Bulk PSU’s	100.0	30.0
Control surface	PC	500.0	150.0
Control surface *	DSP/Digital I/O rack *	100.0	30.0
PC	DSP/Digital I/O rack	100.0	30.0
DSP/Digital I/O Rack	Racks Bulk PSU’s	100.0	30.0
DSP/Digital I/O Rack	Analogue I/O Rack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

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

POWER SUPPLIES

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.

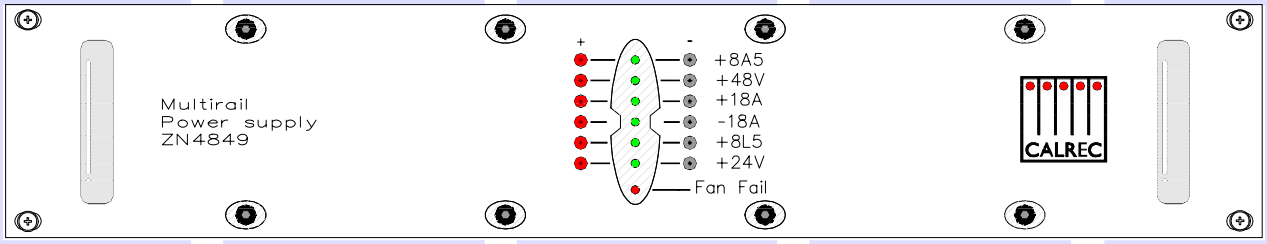
Bulk PSU (Powers Control Surface & DSP/Digital I-O Rack)



The Control Surface and DSP/Digital I/O Rack are powered as one unit from a Bulk PSU Rack, 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. Depending on the console size and the distance between console and rack, one or two PSU's are required. An optional second or third PSU, in the rack, can act as a hot spare.

The Bulk PSU 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. Noise measurements for the fans can be found in the section entitled "Technical Specification".

Multi-Rail PSU (Powers Analogue Racks)



Analogue racks use a different 2U Multi-Rail PSU. The number of PSU's required will depend on the type of installation. Generally, one PSU is required for one analogue rack, and two for two fully populated analogue racks. An additional Multi-Rail PSU can serve as the hot spare for several racks, but only if they are housed together. If the racks are housed in different locations, each may require a hot spare. This will depend on the cable lengths involved.

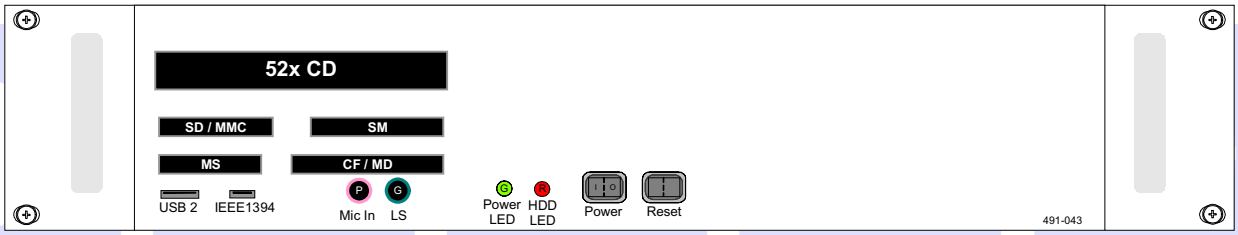
The Multi-Rail PSU is also fan cooled but uses a very low noise fan, drawing air from side to side through the PSU, instead of in from the front, to further minimise noise. Noise measurements for the fans can be found in the section entitled "Technical Specification". The Multi-Rail PSU's are fitted with rear flanges. These allow the rear of the PSU to be bolted to the studio equipment bay.

All hot spare PSU's are optional.

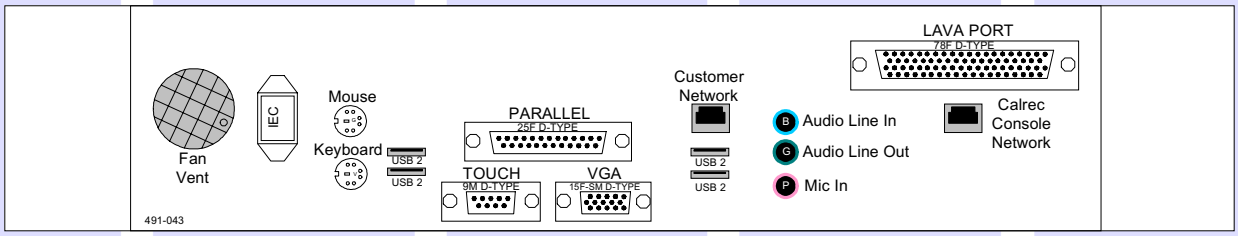
PC SPECIFICATION

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 Sigma 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.

TECHNICAL SPECIFICATION

DIGITAL INPUTS

	AES/EBU (AES3)	24 Bit, transformer balanced 110 Ohm balanced 5v Pk-Pk or 75 Ohm unbalanced 1v Pk-Pk also suitable for use with SPDIF (IEC958 Type 2) signals
	24 Bit sample rate conversion switchable on all digital inputs	
	SRC THD+N	-117dB @ 1kHz

DIGITAL OUTPUTS

	AES/EBU (AES3)	24 Bit, transformer balanced 110 Ohm balanced 5v Pk-Pk (nominal) or 75 Ohm unbalanced 1v Pk-Pk

ANALOGUE INPUTS

	A-D Converter	24 Bit resolution
	Analogue input for 0dBFS	Can be pre-set globally to +28, +24, +22, +20, +18 or +15 dBu
Mic/Line Input Card	Electronically balanced	>1K Ohms for Mic gains, 10K Ohms for Line gains
	Sensitivity	+18/-78dB
	Pre Fader Headroom	Adjustable globally from +24 to +36dB in 2dB steps
	Equivalent input noise	-126dB
	Source impedance	150 Ohms
Line Level Input Card	Electronically balanced	10K Ohms
	Sensitivity	+18/-24dB
Distortion	-1dBFS @ 1kHz	Better than 0.003%
	-20dBFS @ 1kHz	Better than 0.006%
	-60dBFS @ 1kHz	Better than 0.3%
Frequency Response	Mic/Line input card	20Hz to 20kHz +/- 0.5 dB
	Line input card	20Hz to 20kHz +/- 0.25dB

ANALOGUE OUTPUTS

	D-A Converter	24 Bit resolution
	Analogue output for 0dBFS	Matches input setting into >1KOhms (+24dBu max into 600 Ohms)
Line Level Output Card	Electronically balanced	<40 Ohms output impedance
Distortion	-1dBFS @ 1kHz	Better than 0.003%
	-20dBFS @ 1kHz	Better than 0.006%
	-60dBFS @ 1kHz	Better than 0.3%
Frequency Response	20Hz to 20kHz	+/- 0.25dB
Output Balance	20Hz to 20kHz	>-35dB, Typically -45dB

PERFORMANCE

Distortion		
Digital to Digital (AES/EBU)	-1dBFS, 20Hz to 10kHz	Better than 0.002%
Digital to Digital (with SRC)	-1dBFS, 20Hz to 10kHz	Better than 0.005%
Frequency Response		
Analogue input to output	20Hz to 20kHz	+/- 0.5dB

SYNCHRONISATION

48kHz synchronisation from:
NTSC Video, PAL Video, or Internal Crystal Reference

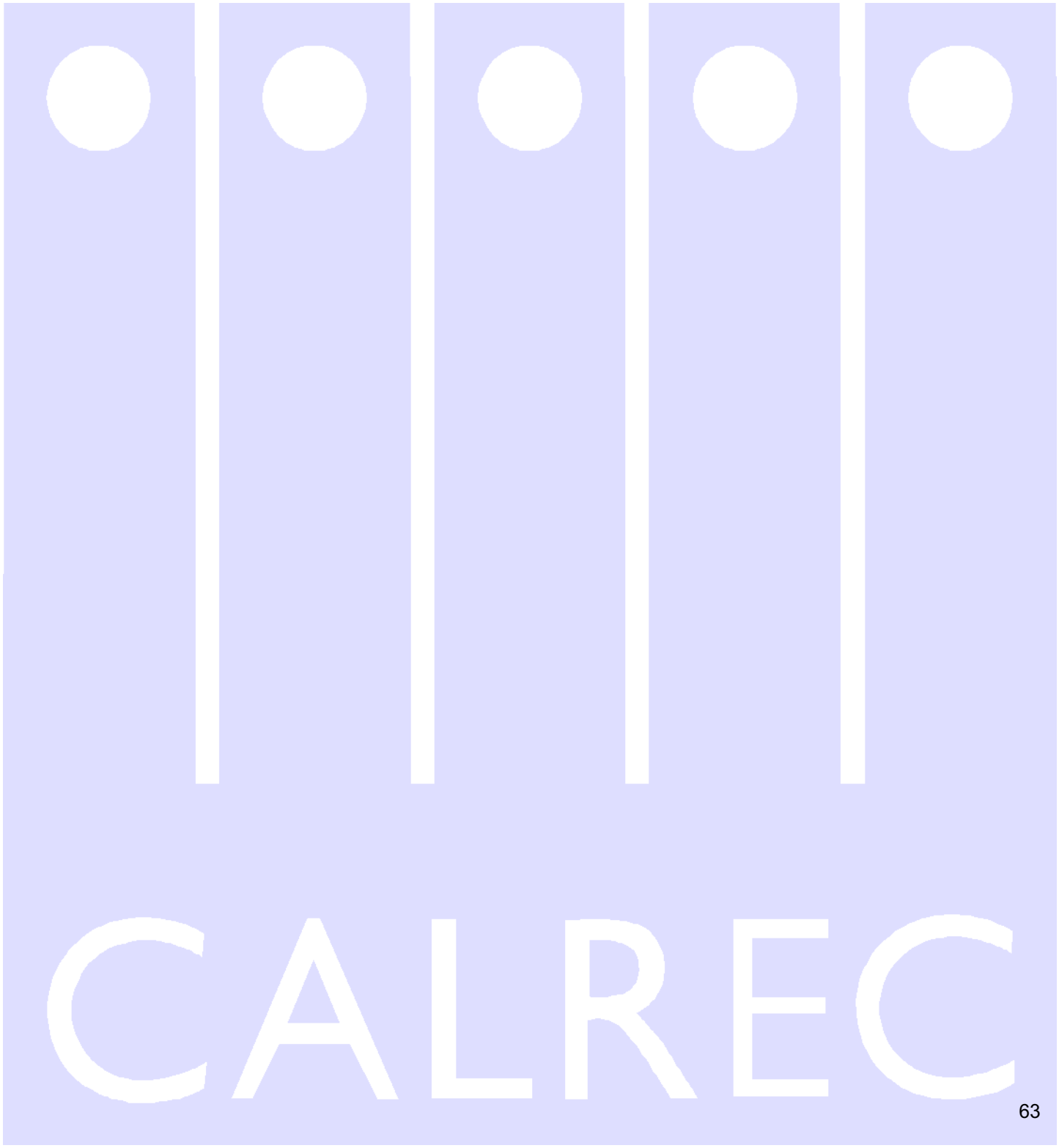
or synchronisation to:
TTL Wordclock (48kHz +/- 100 Hz) or AES/EBU Digital Input (48kHz +/- 100 Hz)

SYSTEM FAN NOISE (dB SPL A-WEIGHTED)

The following noise measurements were taken on axis at 1 metre from the dominant noise source.

Bulk PSU Rack	24V 1kW PSU	49dBA
	24V 1kW PSU (x2)	52dBA
	24V 1kW PSU (x3)	54dBA
Multi Rail PSU for Analogue Rack		29dBA

NOTES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