SIGMA
SYSTEM PLUS

TECHNICAL SALES DATA
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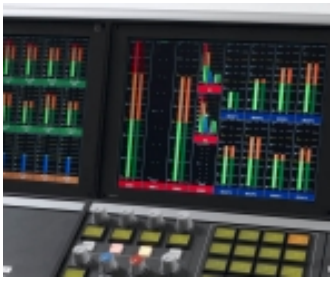
Overview






INTRODUCTION

Sigma 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 digital system architecture, Sigma provides comprehensive features and functionality with sophisticated failure protection systems.

System Plus celebrates a milestone in the evolution of Calrec consoles, providing increased functionality, which is upgradeable for existing consoles. Sigma continues to meet the changing requirements demanded by the on-set of surround sources in live production, providing sophisticated assignable monitoring solutions and encompassing flexible TFT style metering.

The introduction of digitally controlled assignable systems in 1980 has allowed for their ergonomics to be continuously refined by user input and the Sigma reflects this in its user interface. Fully assignable control means that any fader can control any channel or group. The flexibility offered by digital control and a computer-aided memory system has been harnessed to provide greater functionality and ease of use.

Sigma System Plus 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, 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. Sigma 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 and 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.
User-definable monitor selection and control panels.
User-definable metering system, with recallable meter configurations.
Flexible TFT screen-based meters with total user-configurability.
Input Delay control screen with additional control panel option.
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/Limiter and Expander/Gate.
All groups have Compressor and Expander/Gate.
Up to 12 auxiliary outputs which can be paired for stereo.
There is a pool of assignable inserts and a pool of direct outputs for channels and groups.
Inserts can be pre EQ (on channels), pre fader or post fader.
Pre configured inserts are assignable to any channel or group.
Direct outputs can be pre EQ (on channels), pre fader, or post fader.
Every direct output can be a mix minus feed.
Automatic cross-fading facility, with user-definable fade out and in times.
All faders are motorised and touch-sensitive.
A centrally assigned fader allows control of any fader from the optimum listening position.

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 allows 99 full console snaphot or partial memories.
PC backup allows an unlimited number of memories.
Sophisticated GPIO facilities.
Console operates independantly of PC.
Independent DSP operation ensures audio continuity even during PC or control reset.
Console and racks boot from power on in less than 20 seconds.
Full control system reset in less than 15 seconds.
Automatic change over to hot spares for PSUs, control cards and DSP cards.
All cards and modules are designed to be Hot Plugged.
All cards and modules are designed to initialise upon insertion.

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.

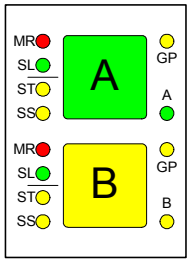
The faders are motorised so, when switching between A and B, the fader will move to the correct position.

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.

This arrangement allows more channels to be fitted into the space available in the frame. Channels towards the ends of the control surface can be accessed more quickly than on a conventional, single layer design.

Assignable Control

Each fader has an Assign button for each audio path. The Assign buttons are labelled A and 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. As there is less need to move around a large control surface, controls can be accessed more efficiently.

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 “channel” faders are assignable, in that 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 input 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 available, plus an internal matrix to allow any of them to be connected to any channel. This provides more flexibility than is possible with analogue designs. The matrix can be thought of as an electronic patch-bay with the advantage that any connections made will be stored with the console's memories. A similar matrix and pool is provided for the outputs which 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, 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

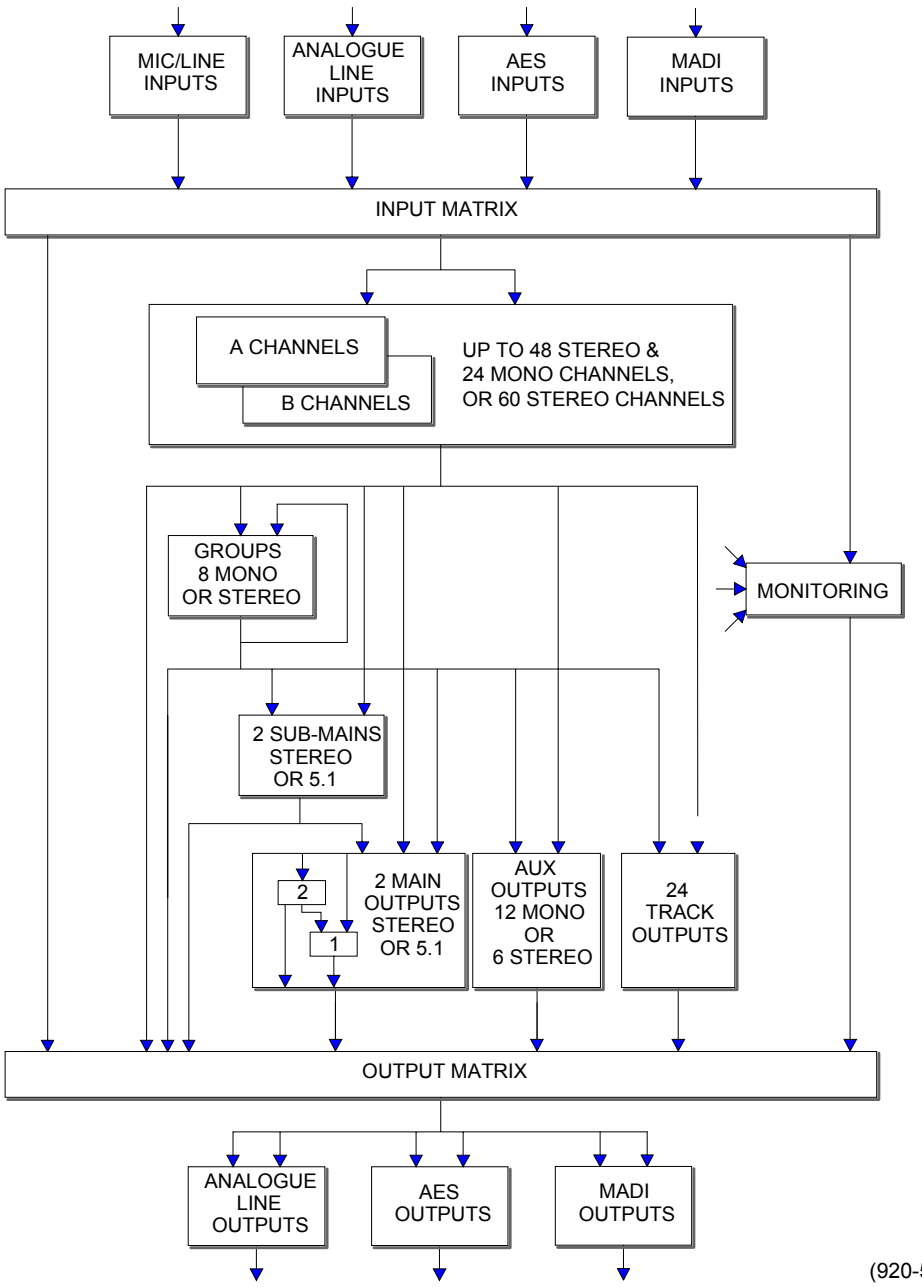
The system can have 120 equivalent channels: Up to 48 stereo plus 24 mono channels, or 60 stereo channels.

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

If a main or sub-main output is designated as 5.1 surround, then a mono rear is derived at the output to allow it 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.



INPUTS AND OUTPUTS

There are two types of ANALOGUE INPUT CARD:

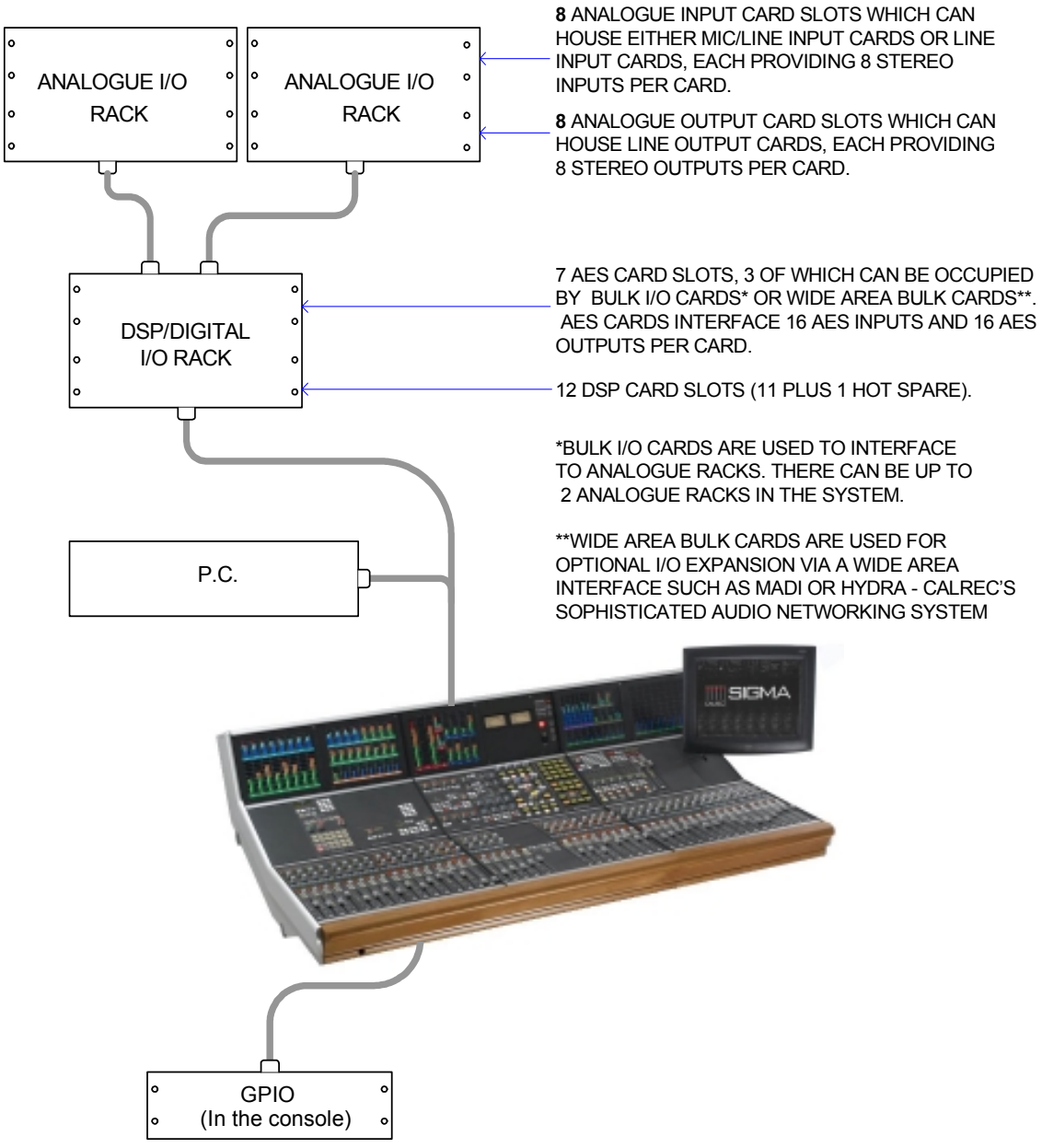
- Mic/Line input card - 8 stereo or 16 mono inputs per card.
- Line input card - 8 stereo or 16 mono inputs per card.

There is one type of ANALOGUE OUTPUT CARD:

- Line output card - 8 stereo or 16 mono line outputs per card.

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

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



AUDIO PACKS

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

Audio Pack 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 inputs 32 mono line inputs 64 mono line outputs 32 stereo AES inputs 32 stereo AES outputs

Audio Pack 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 inputs 32 mono line inputs 80 mono line outputs 48 stereo AES inputs 48 stereo AES outputs

Audio Pack 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 inputs 32 mono line Inputs 96 mono line outputs 64 stereo AES inputs 64 stereo AES outputs

Audio Pack 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 inputs 32 mono line inputs 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.

TOUCH SCREEN LAYOUT

The system is designed to minimise the need for the operator to use the screen once the console has been preset. A logical user interface provides easy and quick access to the functions and information on the touch screen. Failure of the screen's computer has no effect on the operation of the control surface or the audio.

The Front End screens are divided into groups which are accessed using the buttons along the bottom of the display. 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 subsets of the screen's function.

Operational reproduction of the input delay panel.

Sets the current state of various functions (these are not stored with the user memories or options - only in the live (hidden) memory.)

Operational screens which enhance the controls on the console and for setting options which are stored with the user memories.

Memory control screens to supplement the panel controls.

Set up and display of all the I/O connections stored with the user memories.

Entry to and control of password-protected operational modes, trouble-shooting screens.

The Options screens are used to pre-set the system to the required settings. Includes set up of meter configurations, monitor panel configurations, serial interface and label associations, GPIO and condition switching.

Options settings are not stored in the individual console memories but are saved and loaded separately using the buttons on each Options screen. This allows changes to be made without invalidating any saved memories. Changes to options take effect as soon as they are made, however if they are not saved, the next time the desk boots up the options will revert to their previous settings. Upon loading the options settings from the file on the hard disk, any changes made will be overwritten unless they have been saved. This allows changes to be tried without losing the original settings and the original settings can be restored without having to re-boot the system.

Screens for setup and control of an audio network system (Only visible if the Hydra audio networking system is installed).

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 its indicator will be green. When busy, the processor's indicator will be amber, during which time, no changes can be made to the control screens (Although changes to the control surface can be made, and will take immediate effect).

Frame Options and Dimensions

CONTROL SURFACE FRAME SIZES

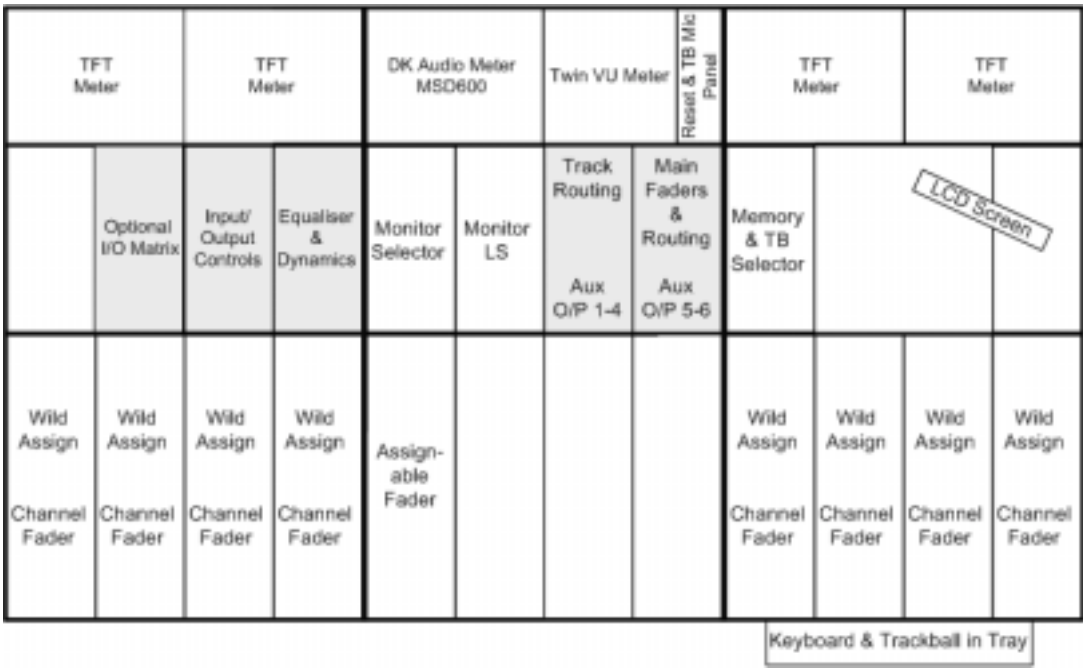
Frames are made up of sections which can be 4, 5 or 6 modules wide. This allows many different sizes of console to be achieved using different combinations of different sized sections. Fader modules have 4 faders each, so console size can depend on the number of faders required.

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

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

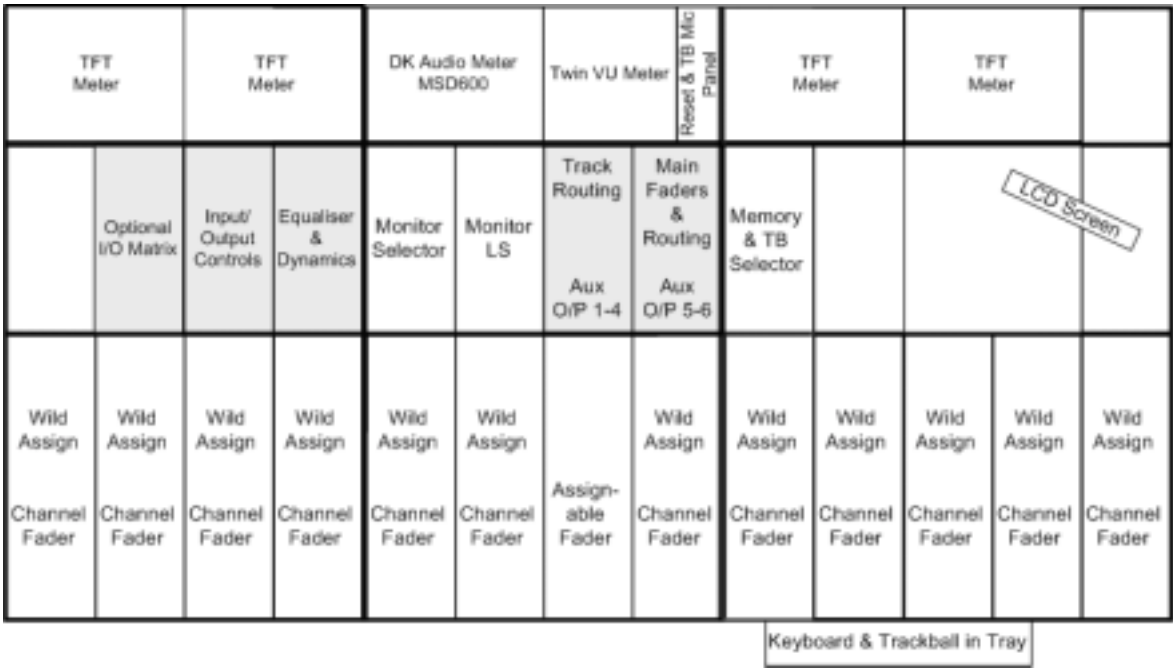
Typical Frame (4:4:4)

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



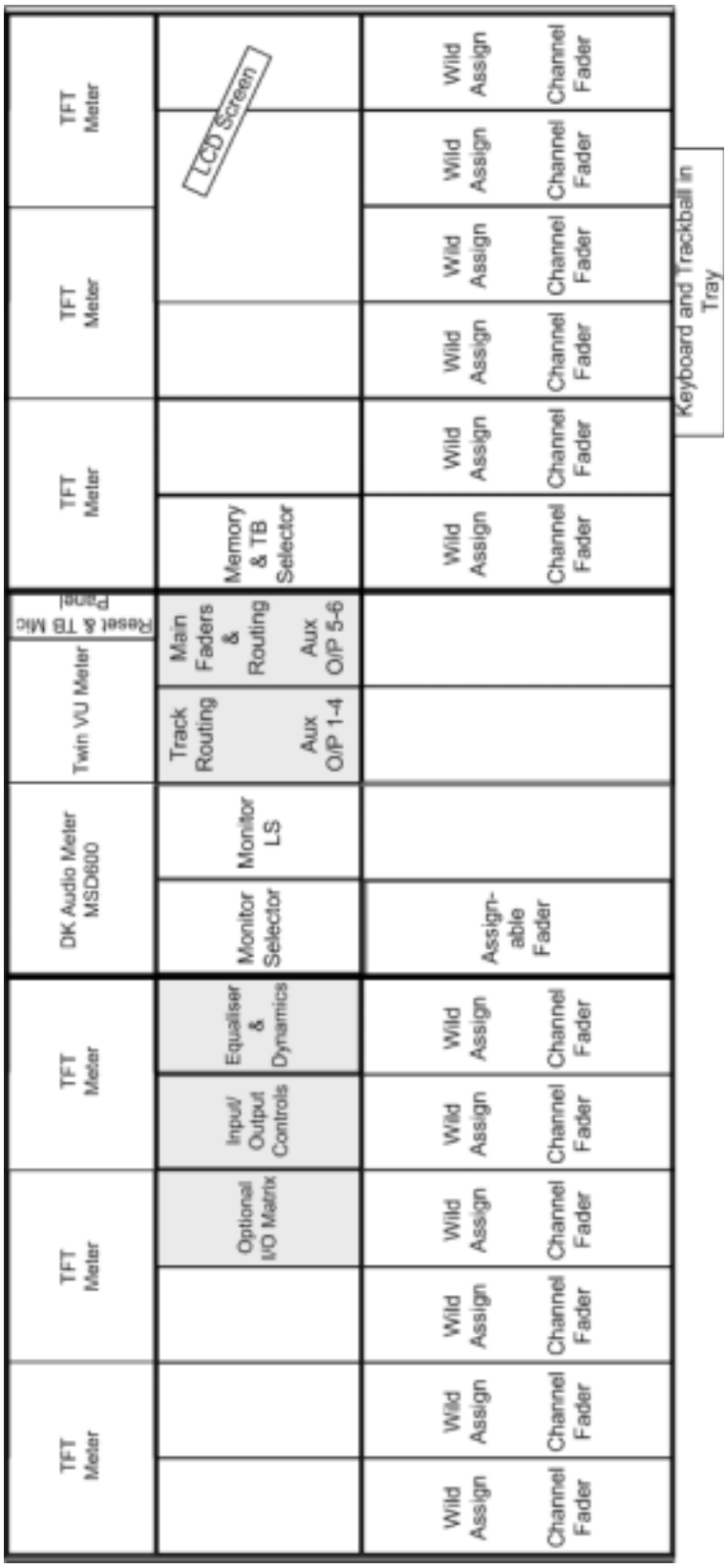
Typical Frame (4:4:5)

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



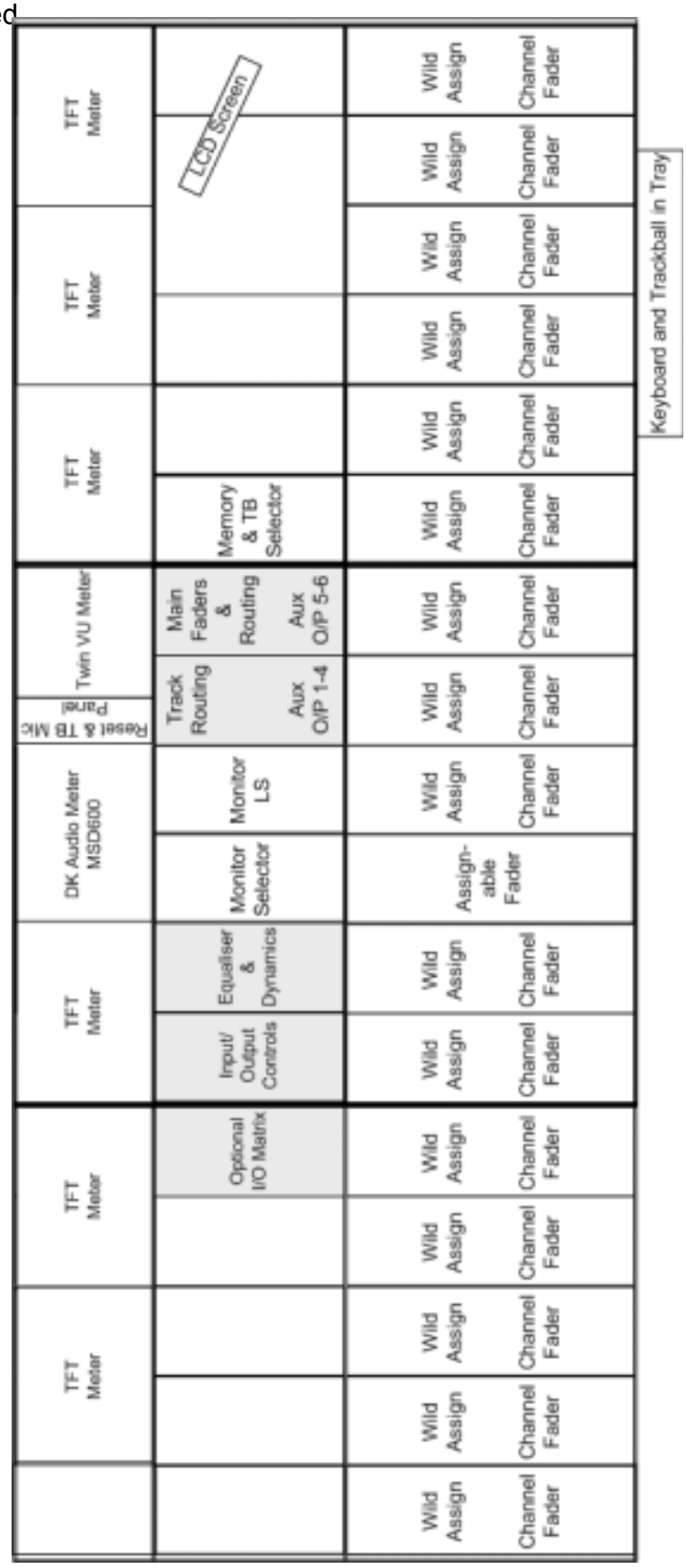
Typical Frame (6:4:6)

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



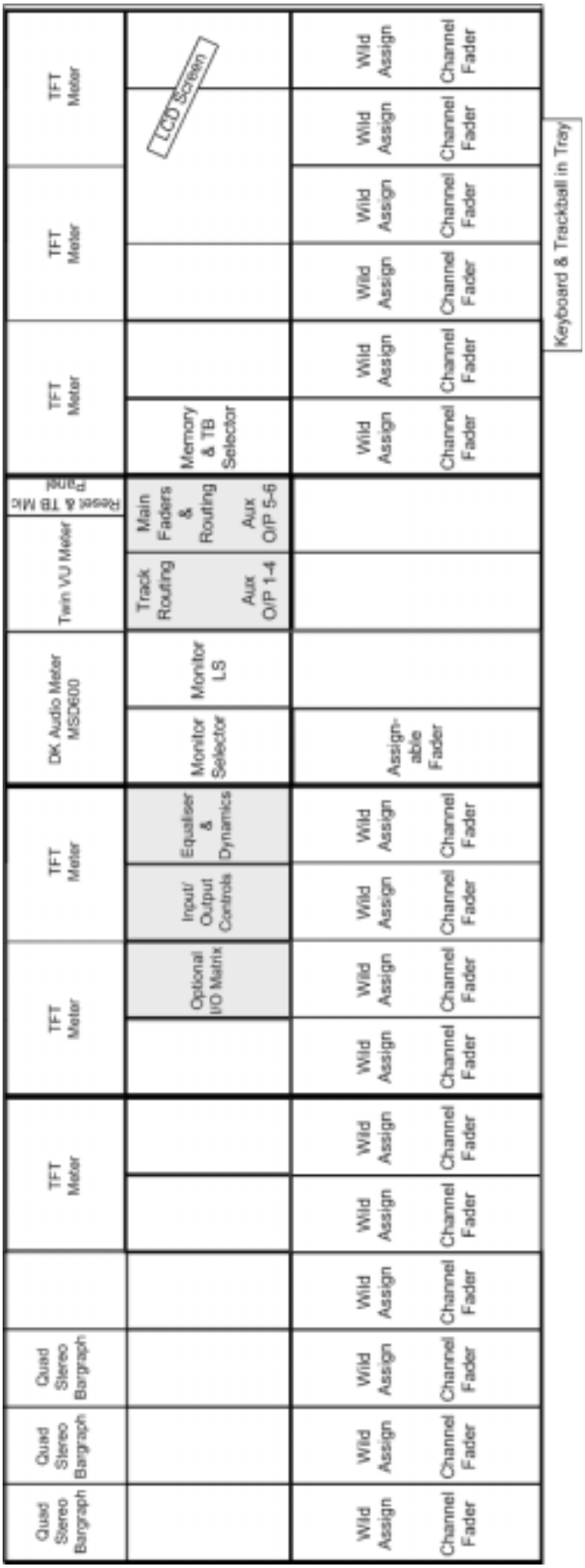
Typical Frame (5:6:6)

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

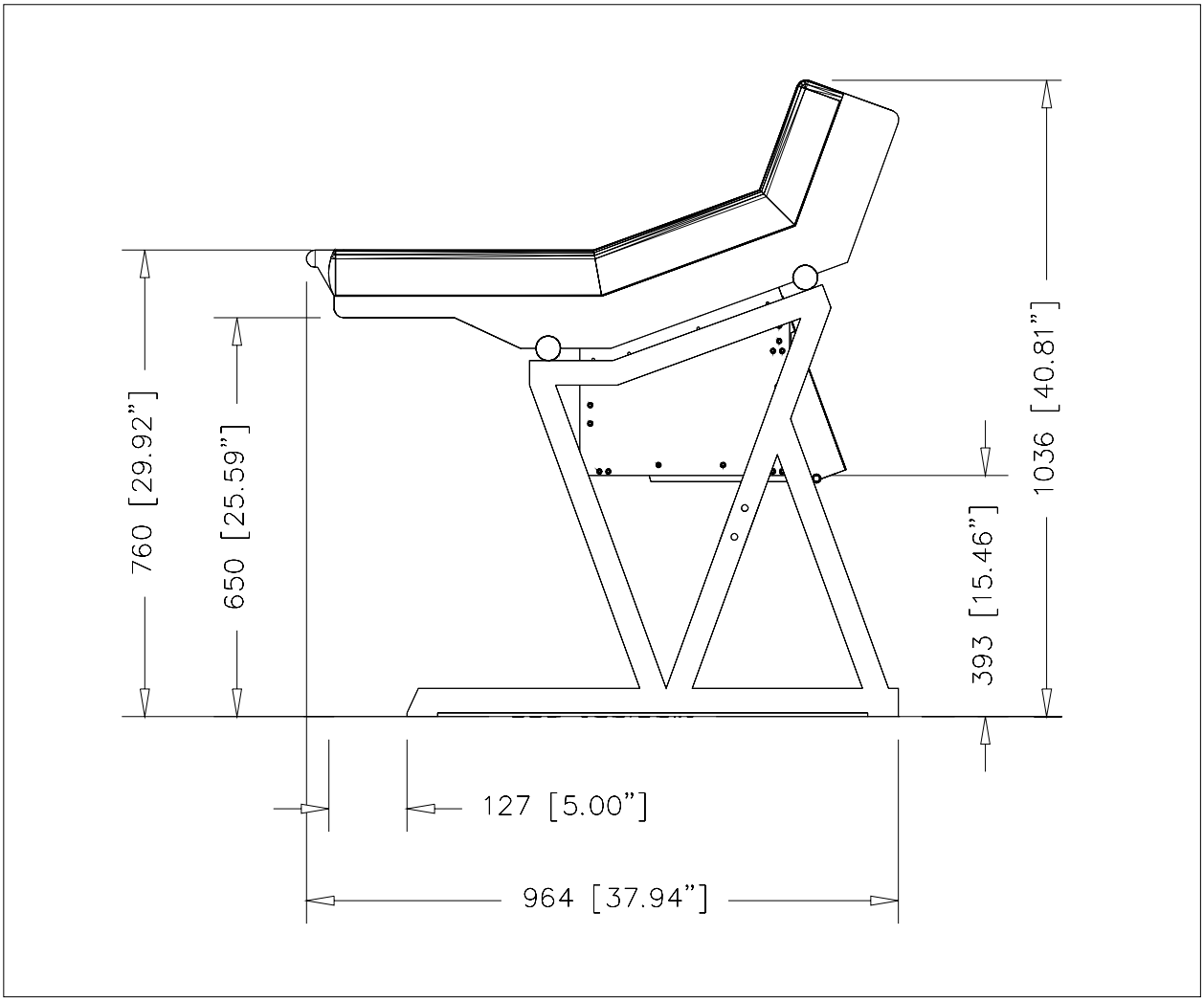


Typical Frame (6:4:4:6)

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

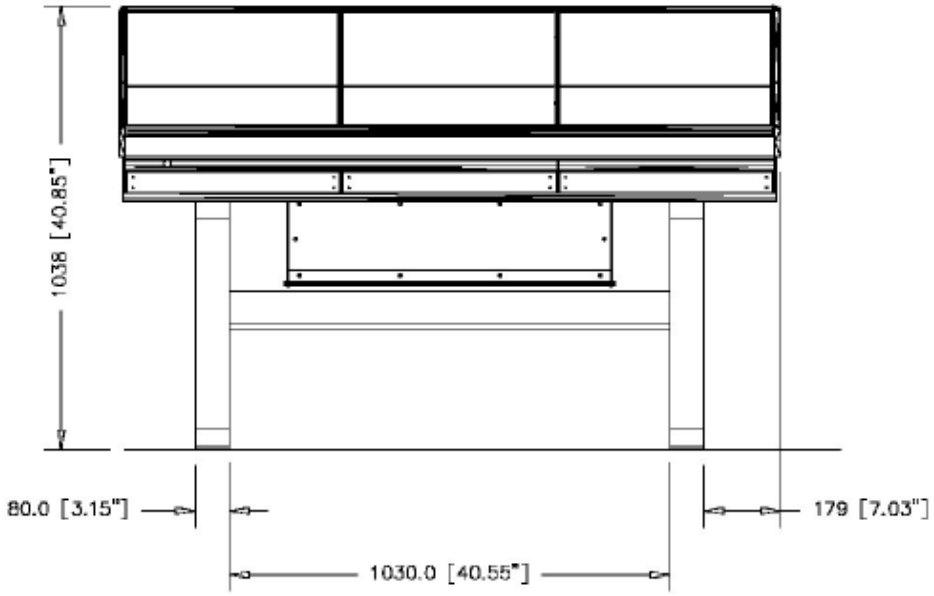


END ELEVATION

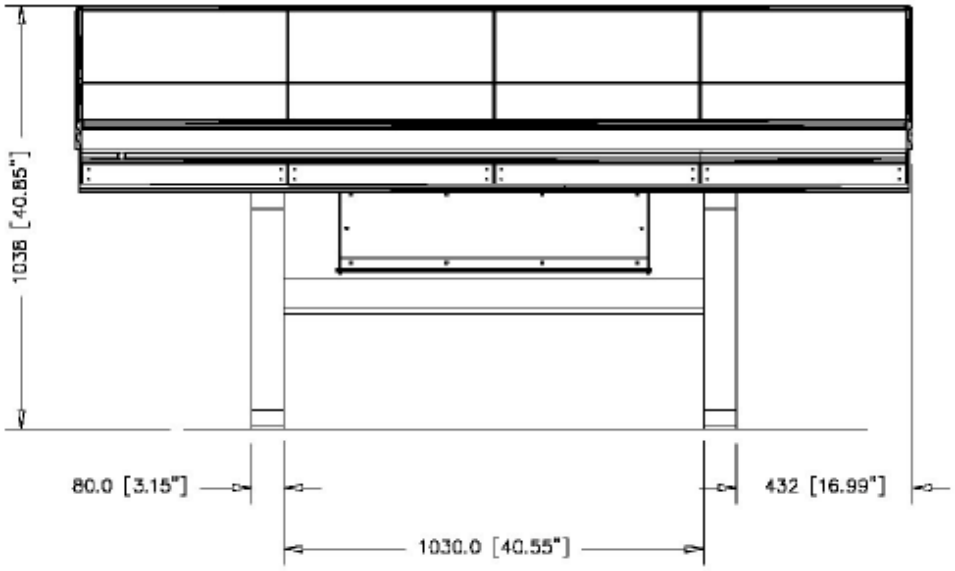


The end elevation dimensions are the same for all frame sizes. The control surface can be seperated from the stand for access to the premises. The control surface sections can also be split apart if required.

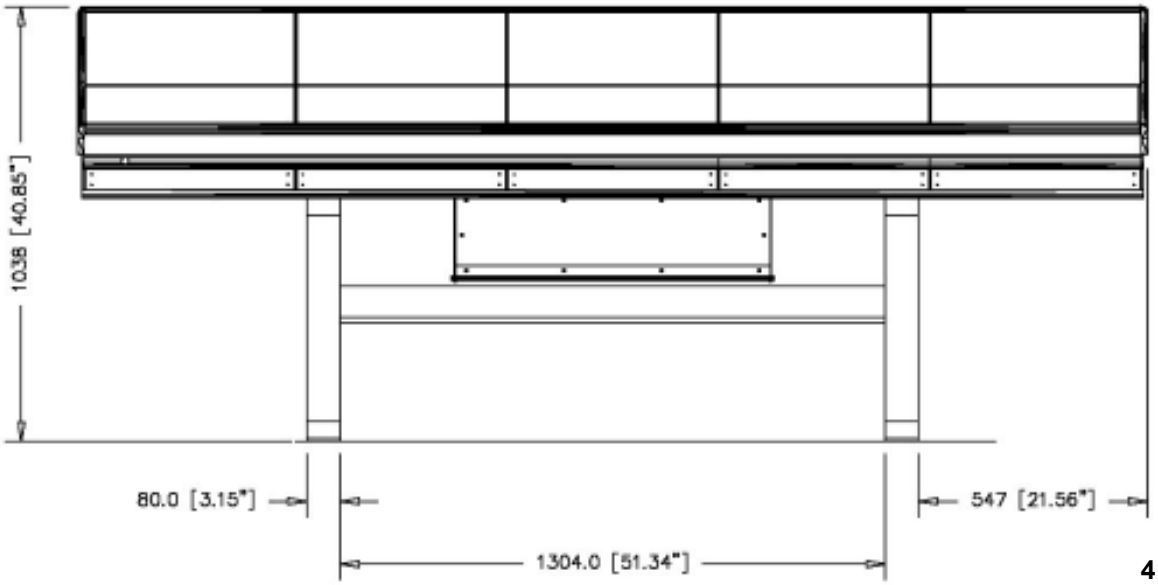
FRONT ELEVATION



4:4:4 Frame



4:4:4:4 Frame

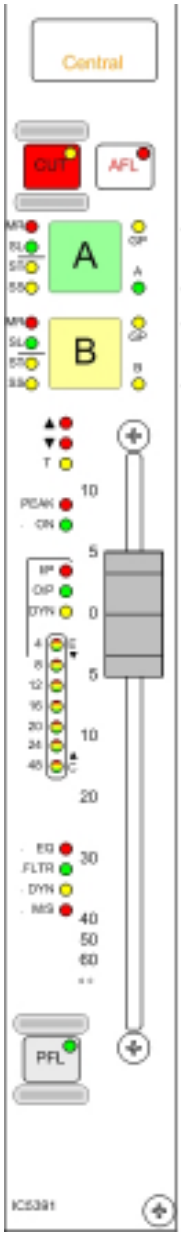


4:4:4:4:4 Frame

Fader Area




CHANNEL AND GROUP FADERS



Channel and group paths are controlled by the channel faders. Any fader can control any channel or group path. Main output paths have their own dedicated faders in the main outputs section.

The display shows the name or label associated with the input assigned to the path, or the group number if the path is a group. The inputs can be given user-friendly names using the I/O - Input screen, otherwise they default to the Port ID.

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

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.

Each fader can control two independent audio signal paths, A and B. The A and B buttons are used to select the two channel paths. Selecting a path will "call" the fader to the Assign panels and its fader assign button will light. 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. On the display, path A's label is shown in the top half, and path B's label is shown in the bottom half. 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.

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** - This LED is not used.
- **A** - Path A is active.
- **B** - Path B is active.

The ▲ and ▼ Null LEDs illuminate when the position of the fader 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 to indicate whether the audio is above or below the position of the fader. The T LED indicates that the console has recognised that the fader has been touched.

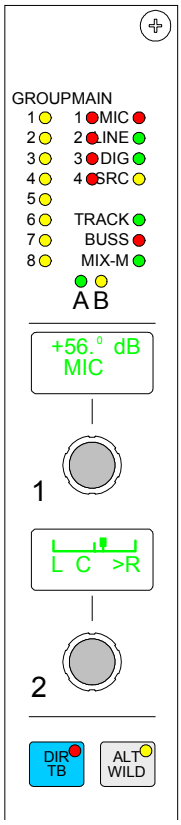
The PEAK LED will light if the channel, main or group signal is within 3 dB of the clipping level. The ON LED lights when the audio level is not at the ∞ position.

The fader bargraph indicates the level at the channel input (post the input gain and switching and the tone switching), the channel direct output, or the gain reduction of the dynamics, indicated by the three LEDs. Selection is made using the USER-CHAN screen.

The EQ, FLTR, DYN and M/S LEDs indicate that these functions are active on the selected path.

PFL is provided on the fader overpress and on the button. It is heard on the small LS (or the main LS if PFL to Mon is selected), or PFL LS (depending upon the monitoring configuration).

CHANNEL CONTROL



Above the channel fader section, there are a set of indicative LEDs and a set of user-definable rotary controls (Wild controls) for each fader path.

A set of LEDs provide good visual feedback 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 bus.
- Whether the direct output is being fed with a mix minus feed

There are 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

Wild controls are assigned using the USER-CHAN screen. Once assigned, the Wild controls "FLIP" with the fader providing the same function for each of the two paths. The A and B faders may also be assigned to a Wild control, in which case it will be the opposite fader which is being controlled. The colour of the Wild control display will show which fader the control is related to: Green for A, Amber for B.

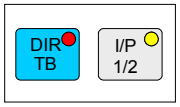
Wild Control Push-Switch Option

If a wild control has the Aux Send or Front Pan controls assigned to it, the user can control the ON/OFF or IN/OUT status of these controls using the Wild control push-switch. This feature is optional, so it can be enabled or disabled using the Options - MISC screen.

Talkback is available to direct outputs using the DIR TB button. All Talkback buttons are subject to On-Air inhibits, set up on the Options - TX/REH screen.

Button 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 inputs 1 and 2. This is usually done using the Input/Output panel for the currently assigned fader. As an option, these buttons can be duplicated for each path on this panel. Input 1 is selected when the button LED is off, and input 2 is selected with the button LED on.

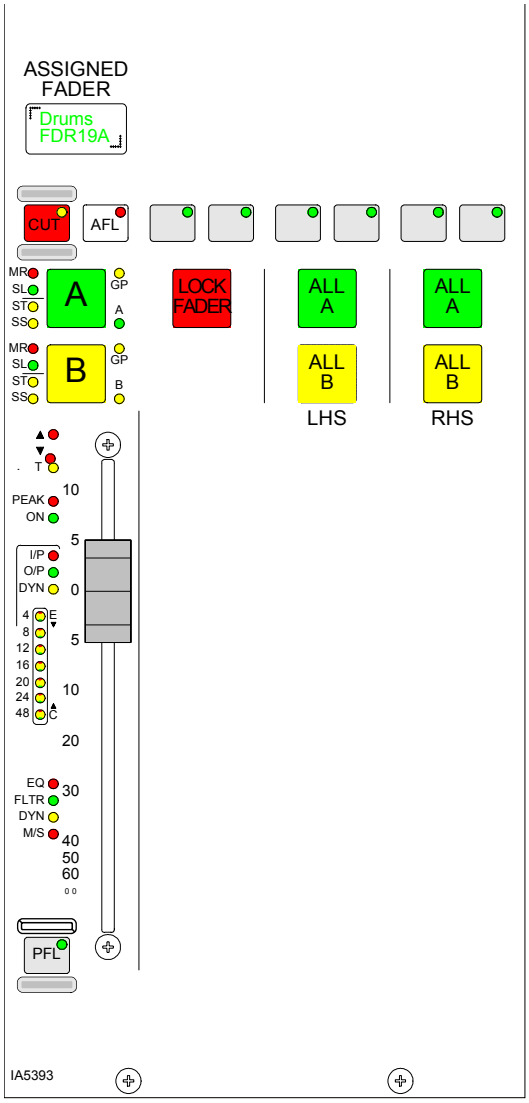
Option 2

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.

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.

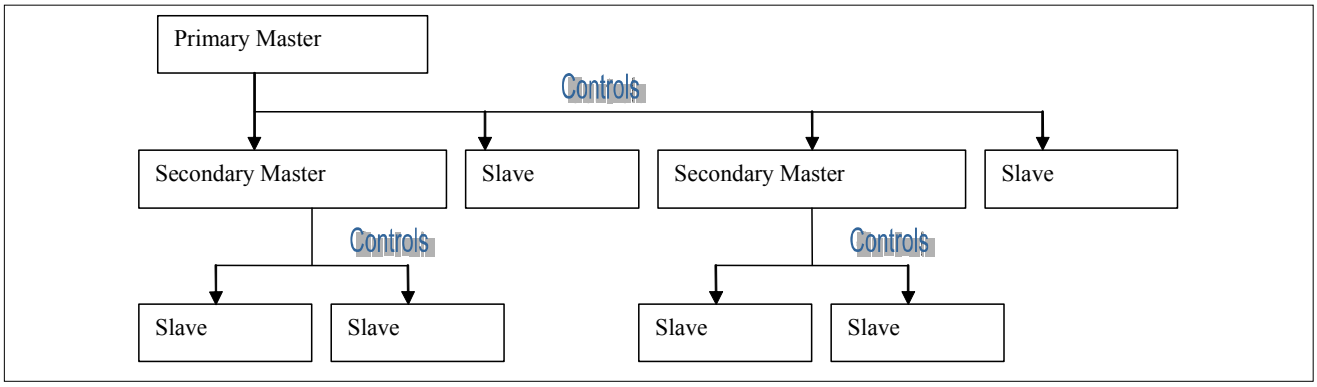


VCA GROUPING

VCA groups allow the audio level, CUT, AFL and PFL functions of several slave faders to be controlled from one master fader. A VCA group is made or edited by holding down the Assign Button (A or B) of the fader to be master and pressing the Assign buttons of faders to be added or removed as slaves. The slave faders will not move when their master is adjusted, but the Null LEDs will illuminate to indicate whether the audio is above or below the position of the fader.

VCA Masters as Slaves of another VCA Group

It is possible to select a VCA master as a slave of another VCA group. When this happens, the slave master is known as the secondary master, and it's master is known as the primary master. When the level of a primary master is adjusted it will change the audio level of its own slaves and the level of its secondary master's slaves by the same amount. Changing the CUT, AFL and PFL settings of a primary master applies the settings to the slaves, secondary masters and their slaves.



When the level of a secondary master is adjusted, the audio level of all its slaves changes by the same amount. Its adjustment will not affect the level of the primary master or its slaves. Changing the CUT, AFL or PFL of a secondary master applies the settings to the secondary master's slaves only.

The number of slaves in VCA group with a primary master would include all the primary master's slaves and the slaves of all its secondary masters. There can be up to 48 members of a VCA group.

It is possible to create the primary or secondary group in any order. A slave can be made into a secondary master by adding slaves to it. The path on that fader will be removed from primary master and become a slave of the secondary master. If a slave added to the VCA group is already a master it will become a secondary master.

The MR and SL LEDs next to the Assign buttons on the fader strip indicate whether that fader is a master or a slave. A secondary master fader has both the MR and SL LED lit.

VCA Group Interrogation

Interrogation provides a clear way of indicating VCA group assignments. Interrogation is performed by holding down the assign button of a VCA group member. The assign buttons of all members of the same group will light. When a secondary master is interrogated, the assign buttons of all its slaves will light, and the primary master's assign button will flash.

Enabling VCA Group Editing

The editing of VCA groups can be enabled and disabled using the States screen. This provides protection against accidental changes.

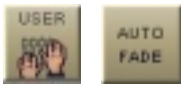
AUTOMATIC CROSS-FADING

This feature allows the user to automatically fade channel and group faders in or out under the control of an external signal. Cross-fades may be achieved by driving two or more optos with one fader being faded out while a second fader is being faded in.

Assigning Auto-Faders to Opto Inputs

Auto-faders are assigned to any one opto input using the OPTIONS - GPI screen. An auto-fader without an assigned opto will remain inactive, its operation will have no effect on the audio but it may still be assigned to a path.

Assigning Channel or Group Faders to Auto-Faders



The User-Auto Fade screen is used to allow assignment of channel or group faders to the 32 available auto-faders. Each auto-fader provides the ability for one path to be faded up to and down from the current fader level. Assignments are made by selecting an auto-fader from the list on the left, and a channel or group fader from the list on the right, and selecting “Patch”.

Fade IN and OUT Times

The fade in and out times of each auto-fader are individually adjustable. The range for both parameters are 10 ms to 5secs, as follows:

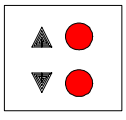
- 10ms to 100ms in 10ms steps
- 100ms to 1sec in 100ms steps
- 1sec to 5s in 500ms steps

Operation

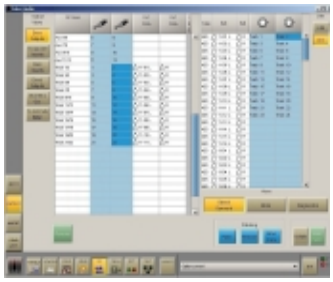
Once an autofader has been assigned to an opto input, and has a channel or group path assigned, it is possible to automatically fade in or out the channel or group fader under the control of the opto input. When the opto input is fired, the path connected to the opto will be automatically faded in to the current fader level (after taking into account any VCA fader adjustment). When the opto is not fired, the fader connected to the opto will be automatically faded out.

Indication of an Auto-Fade

Indication of an auto-fade is provided by illuminating the fader’s down NULL LED when the path is, or is currently being, faded out. If the current physical position of the fader is OFF then this will not apply. The down NULL LED will revert back to its original state as the path is faded back to its current position. If the path’s fader is also a VCA master, the NULL LED operates only if the fader is in VCA interrogate mode thereby exposing the status of the slaved path.

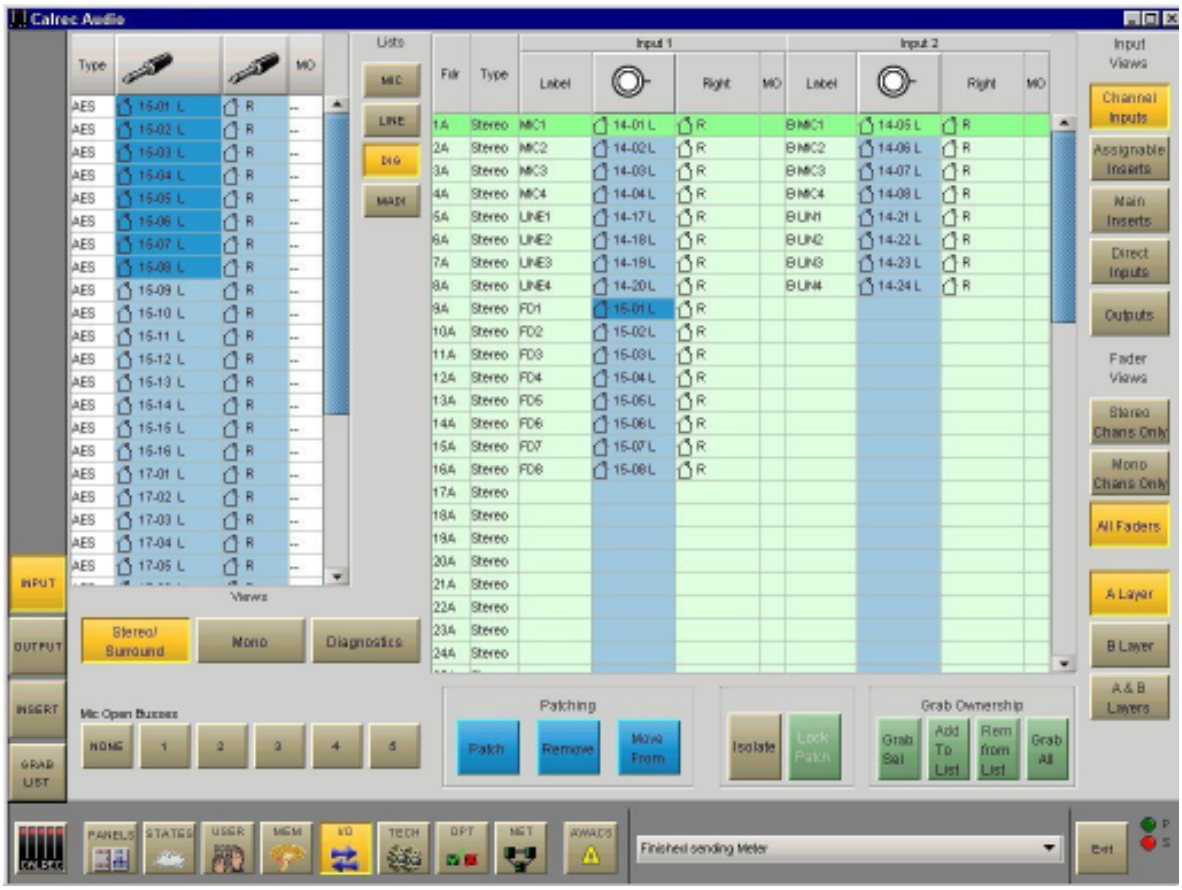


Input and Output Controls




INPUT PORTS SCREEN

The I/O - Input screen allows patching of input sources to channel inputs, insert returns, direct inputs or output ports. The console can incorporate an I/O Matrix panel, so that patching can be done from the control surface.



The left side of the screen lists the available input sources, which may have been grouped into lists during installation. Different lists are accessed using the selection buttons. The Input View buttons on the right side of the screen select the different console path types which can have input ports attached. They will then be displayed in the main section of this screen.

Patching

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

By selecting the label cell on the screen, the input can be given a name. The name is stored with the channel input and replaces the source label on the fader display. It is possible to patch sources to many inputs in one operation using the trackball to select multiple cells in one column. Patches can be removed and moved between inputs when selected using the REMOVE and MOVE FROM buttons.

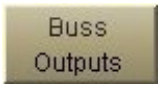
Mic Open Busses

Each input port can be assigned to any of the 5 MIC OPEN busses using the selection buttons. When the port is patched to a channel input, it operates the mic open circuit when that channel is faded up and routed to the programme output. Each buss can be set to automatically cut the studio loudspeaker output and/or fire a relay. These are set on the Options screens: TX/REH and GPO.

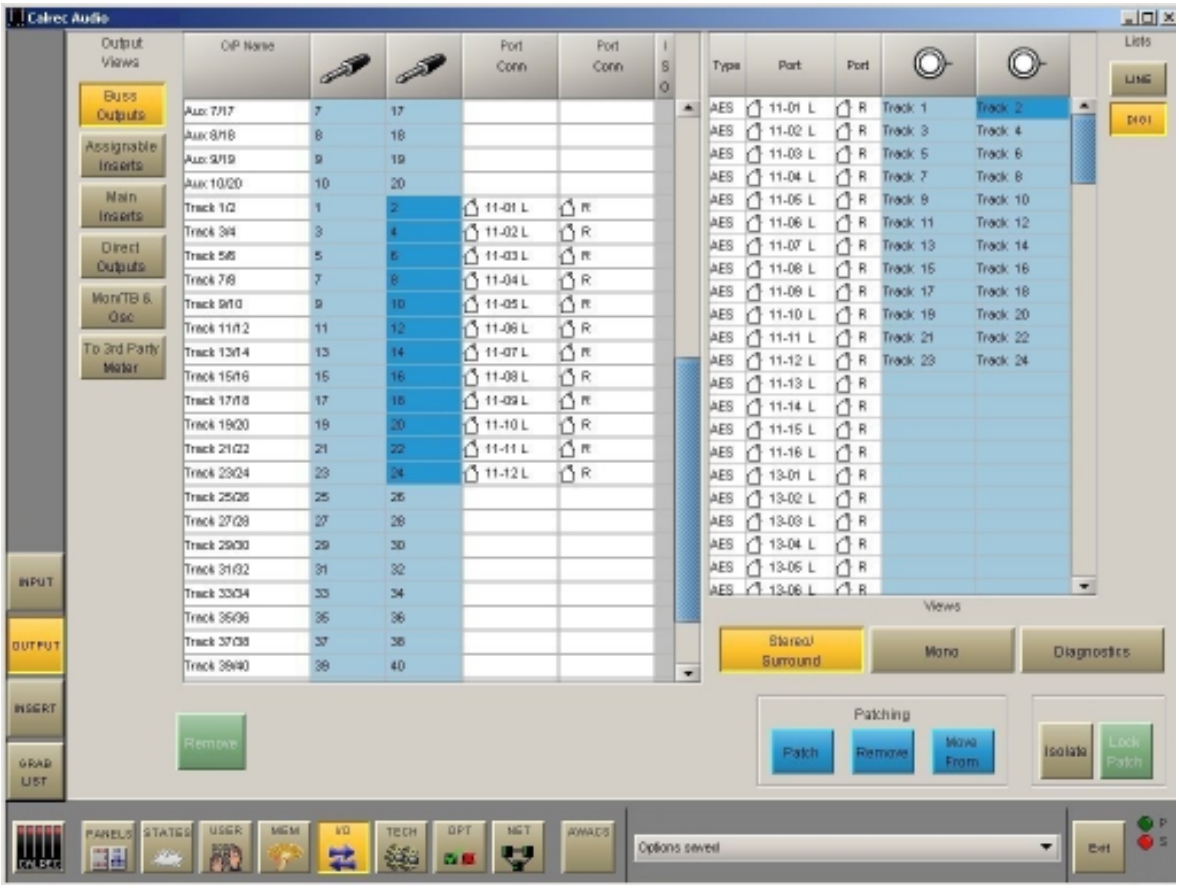
Port Isolation

The ISOLATE button allows the selected port connection to be isolated from memory recall.

OUTPUT PORTS SCREEN



The I/O - Output screen allows patching of console output signals to main, auxiliary and track output ports, insert sends and direct outputs.



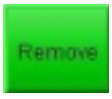
The right side of the screen shows the available output ports, which may have been grouped into lists during installation. Different lists are accessed using the selection buttons. The Output View buttons select the different categories of console output signals which can be patched to output ports. They will be displayed on the left section of this screen.

Patching

To make an assignment, select an output signal,  and an output port,  and select Patch. 

Output signals can be patched to any number of output ports by repeating this procedure. It is possible to patch signals to many outputs in one operation using the trackball to select multiple cells in one column. Patches can be moved and removed from selected output ports using the MOVE FROM and REMOVE patching buttons.

Removing Output Signal Port Connections

The green REMOVE button allows an output signal to be removed from its output port assignment or assignments, without needing to locate the output port or ports to which it is patched. Select the required connection from the “Port Conn” column, and select Remove. 

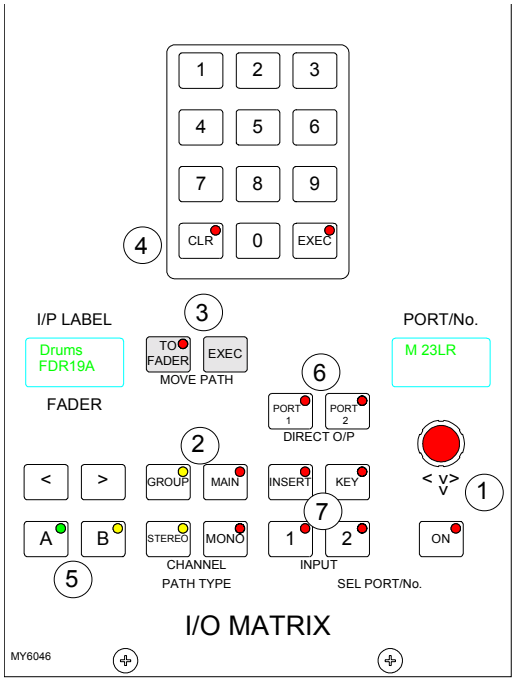
Port Isolation

Output ports can be isolated from memory recall using the Isolate button.

Output Port Locking

Some output ports may be ‘locked’ to avoid accidental removal, using the LOCK PATCH button. Operation of the locking system is only available in “Technician” or “Supervisor” password protected modes.

I/O MATRIX (OPTIONAL)



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

(1) Input Port Assignment

Each channel path can select between two input ports. Ports are assigned to inputs 1 and 2 for the currently assigned fader using the I/O Matrix as follows:

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

The display on the right side of the panel shows the ports available. Pressing and turning the rotary control gives access to lists of other types of port. 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.

(2)Path Type Selection

The GROUP and STEREO and MONO buttons select the path type for the currently assigned fader. If the path is to be a group, its number is selected using the rotary control and ON button. The path type can also be selected using the USER CHAN screen.

(3) Moving Paths

Paths can be moved or swapped from one fader to another, using the MOVE PATH buttons. To move paths, select the assign button of the path you wish to move, and press TO FADER (the assign button will flash). Then select the assign button of the destination fader, and press EXEC to move the path (The two paths will swap over). Any Wild control assignments will move with the path. This function is also available using the USER-CHAN screen.

(4) Clearing Paths

Channels can be cleared off the fader by selecting a fader, then pressing CLR and EXEC. This will clear all settings and port assignments from the channel. This function is also available using the USER-CHAN screen.

(5) Fader Path Selection

In addition to the Assign buttons on the fader modules (A and 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.

(6) 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). When scrolling through the lists of direct outputs, those that are in use will display “IN USE” when the pot switch is relelased.

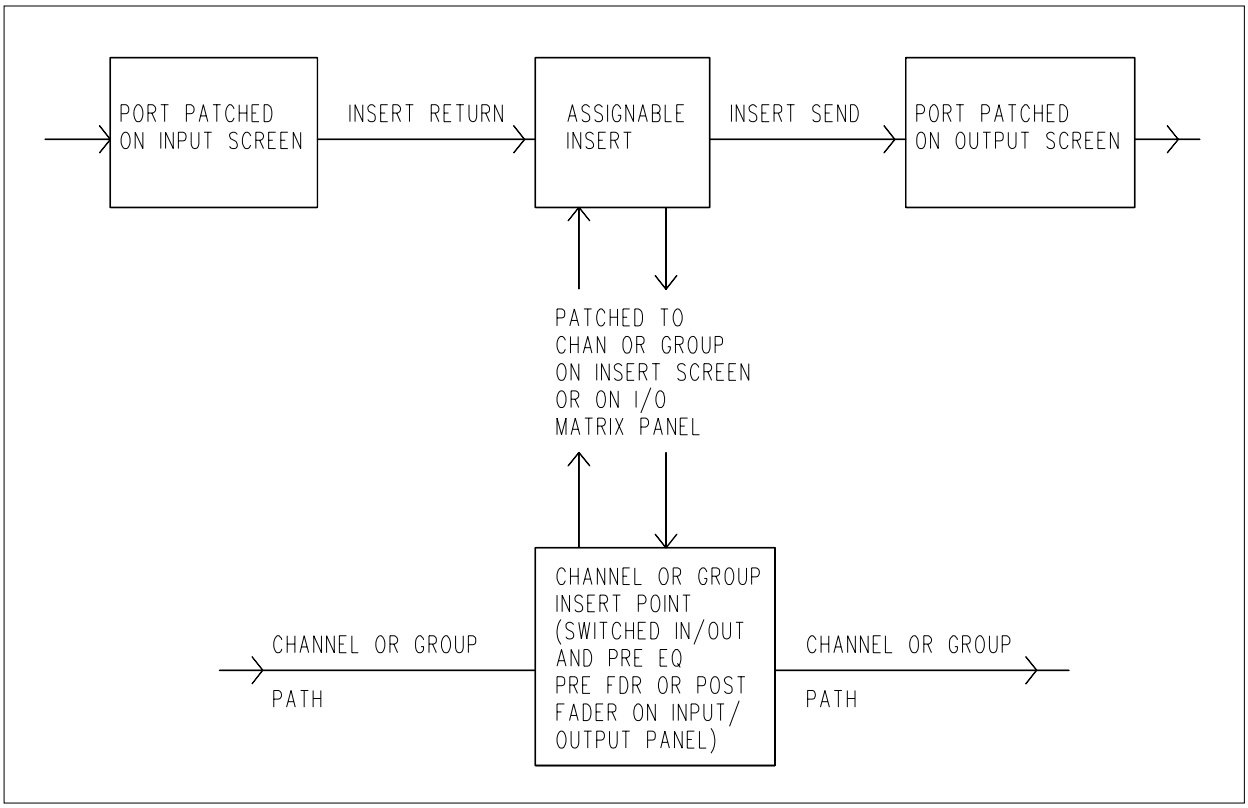
(7) Channel and Group Inserts

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 have their own dedicated inserts.

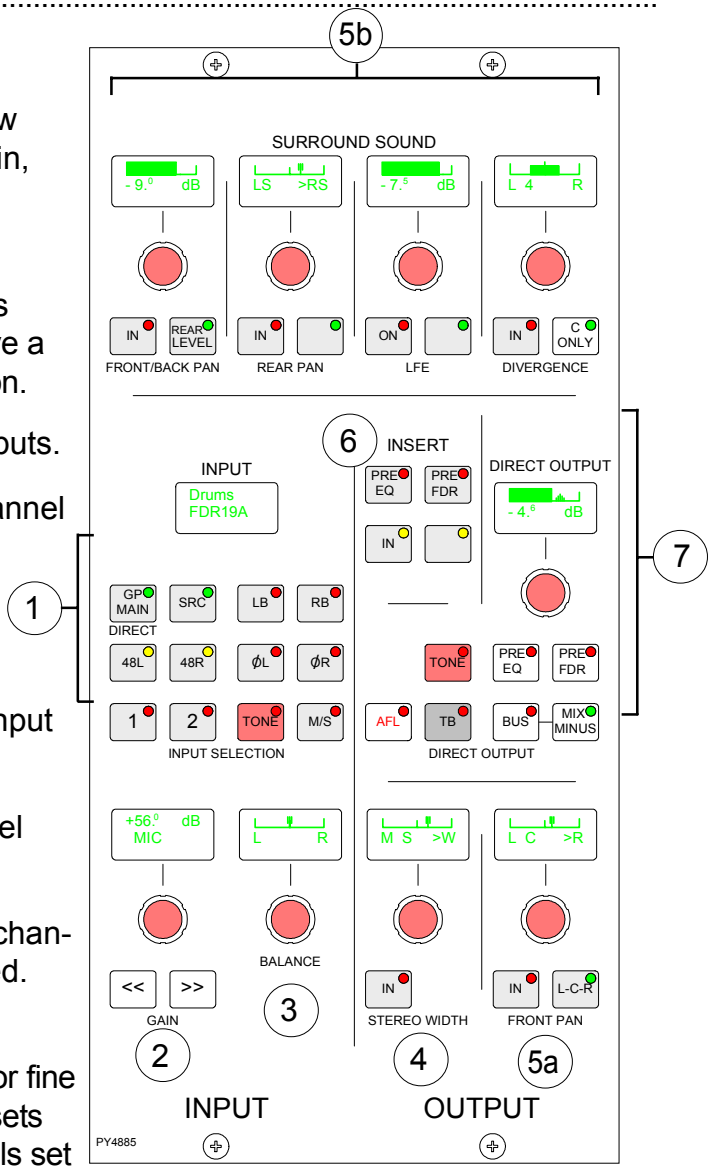
Assignable inserts are designed to be pre-connected to send and return ports which are in turn pre-wired to insertable devices or to an insert patchbay (normally there would be some assignable inserts of each type). The Input and Output screens allow send and return ports to be set up for the assignable inserts.

Pressing the INSERT button allows the rotary control and ON button to control assignment of inserts to channels and groups. This can also be done using the Insert screen. The insert is then patched in and out of the channel or group path using the buttons on the Input/Output panel.

The assignable inserts can be divided into up to 4 lists in a similar way to input and output ports. This separates them for selection on the pot-switch.



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 in its channel control section.

SRC switches the sample rate converter on AES inputs.

48L and 48R switch phantom power on mic/line channel inputs. 48L is used for mono channels.

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

M/S converts a sum and difference (mono/stereo) input to L and 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 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.

The gains of inputs 1 and 2 can be linked such that if either input's gain is adjusted, the change in gain is applied to both inputs. The lower and upper level endstops still apply, and are dependant upon the input type. If one of the inputs reaches an endstop during adjustment, this will stop both gains going any lower or higher. To link the gains, hold down one of the selection buttons, and then press the other.

(3) Balance Control

Operates on stereo channels only. With LB or RB selected, this 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, provided that the monitoring is surround. Stereo and surround panning controls are strengthened with the inclusion of the optional motorised joystick panel.

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 switched IN, the levels to the rear and front are controlled seperately. 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.

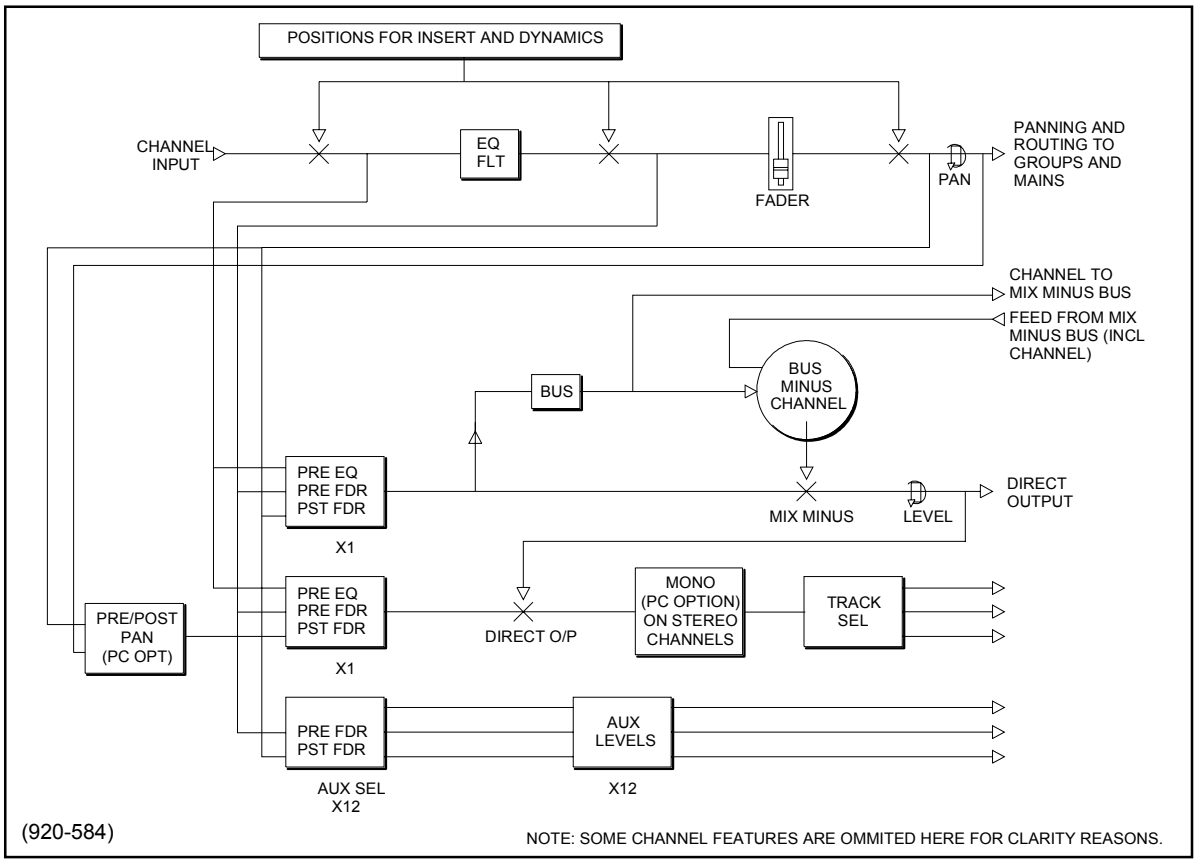
The divergence controls set an amount of the centre signal to also feed to the left and right. Divergence does not operate on stereo channels and groups. The C ONLY button connects the channel output to the centre bus only. All other panning controls are disabled. The channel is fed to both left and right 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 post fader, pre fader or pre EQ. Assignable inserts must first be set up using the I/O screens, or optional I/O Matrix (if fitted).

(7) Direct Output and Mix Minus

In the direct output section, the BUS button 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. The MIX MINUS button 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 and 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.



(920-584)

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

INPUT DELAY

The Panels - Delay screen allows specific amounts of delay to be applied to each channel path. The size and amount of delay resource is dependent on the number of DSP delay cards in the system. The smallest provision is to have 42 legs of delay available for channel assignment, each providing up to 341ms of delay. Alternatively there can be 64 legs of delay available for channel assignment, each providing either 682ms or 1365ms of delay. Stereo channels use two legs.

Assigning Delay to an Input

Select the fader path either by pressing its assign button or by selecting it from the screen, then press ASS. The delay value is adjustable in 0.1ms steps using the rotary control, and 10ms steps using the nudge buttons. The RESOURCE USED display shows the number of legs assigned. The IN button switches the set value of delay in and out of the channel's path.

Interrogation

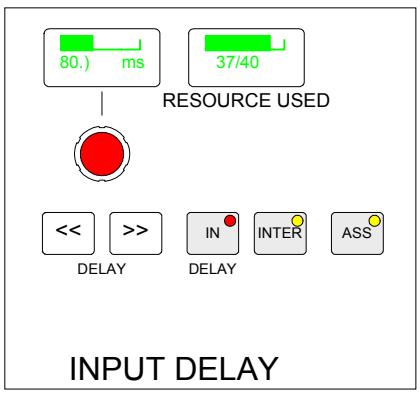
Holding down the interrogate button will indicate the channels which have delay assigned by lighting their assign buttons (all other assign buttons will be extinguished).

PAL Frames, NTSC Frames or ms

The selection buttons on this screen allow the information to be displayed in ms, PAL frames or NTSC frames. Changing the display units also affects the resolution of the delay shaft, nudge up and nudge down buttons accordingly.

Optional Input Delay Panel

The Input Delay panel provides a set of delay controls on the control surface in addition to those already available on the screen. Display units are not adjustable on the optional delay panel. Delay controls can be assigned to Wild controls, and the wild delay control shaft can be used to switch the delay in and out of the channel's path.



Channel Controls



USER-CHAN SCREEN

This screen provides controls for channel functions. The right side of the screen shows the fader paths A and B. To make changes, select the required fader path either from the screen or by pressing its fader assign button, and use the controls on the left side of the screen.

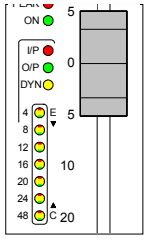
Path Type

The path type can be selected either as a mono or stereo channel using the mono and stereo buttons, or as a group, using the numbered buttons. Path type selection can also be done using the optional I/O Matrix panel (if fitted). Groups are designated as mono or stereo using the Busses screen.

Path Operations

Paths can be moved and cleared using the Path Operations buttons. Each control requires its EXEC button to be selected before the action is carried out. This can be done from the control surface if the optional I/O Matrix panel is fitted.

Fader Bargraph Assignment



The fader bargraph can indicate the level at the channel input (post the input gain, input switching and tone switching), the channel direct output, or the gain reduction of the dynamics. Buttons I/P, DIR O/P, DYN and OFF on the USER-CHAN screen will set the function of the fader bargraph on the currently assigned fader. If ALL is pressed first (flashes) all fader bargraphs will be set to the selected functions.

WILD ASSIGN

The Wild controls above each fader 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:

- Select a fader path from the right side of the screen or by pressing its assign button (A or B).
- Select WILD ASSIGN 1, or 2 on the screen.
- 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.

CLR will clear the selected Wild control from its assignment.

Multiple Wild Control Assignment
It is possible to assign controls to more than one fader path at a time, either by selecting individual fader assign buttons (A or B), or by defining a “block” or “Region” of faders. The button above HOLD toggles between SELECT mode and REGIONS mode.

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 selecting 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.

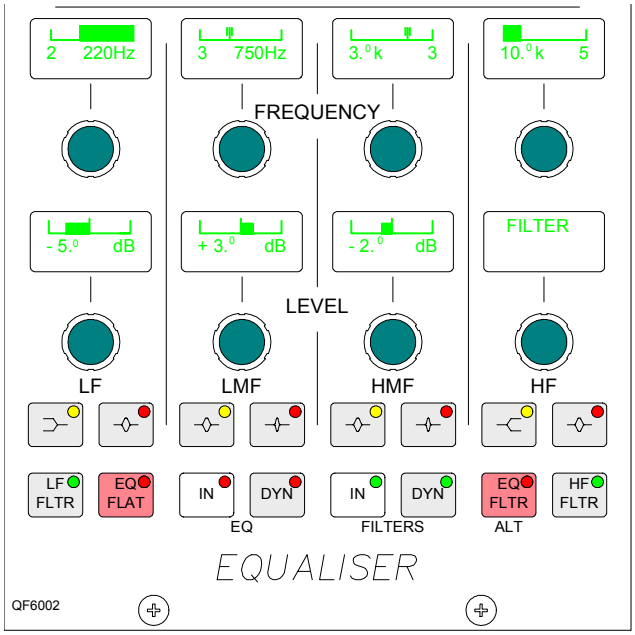
It is possible to assign the same control to Wilds 1and 2 for all fader paths by selecting ALL before pushing the required Assign panel rotary control.

The gains of the two inputs 1 and 2 can be assigned seperately to Wild controls, by holding down the required input button on the Input/Output panel before pushing the gain adjustment rotary control.

Alternate Wild Controls
The ALT button will be visible if the Alternate Wild Control button option has been taken. This allows switching between two complete sets of alternate wild settings. This would then allow up to 4 available wild controls per fader.

Wild Control Push-Switch Option
If a wild control has the Aux Send, Input Delay or Front Pan controls assigned to it, the user can control the ON/OFF or IN/OUT status of these controls using the Wild control push-switch. This feature is optional, so it can be enabled or disabled using the MISC screen.

EQ AND FILTERS



The Equaliser section of the module controls EQ and Filters on the channels.

As console processing is not pooled, every channel can have EQ assigned without fear of running out.

The currently assigned channel's frequencies can be adjusted using the following controls:

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 adjustable by ±15dB. Excessive control ranges are deliberately avoided to simplify operation.

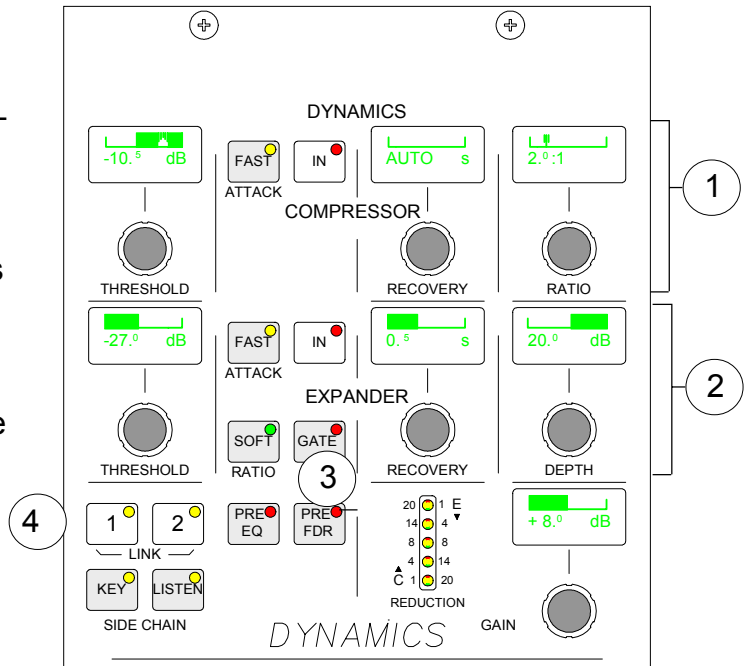
EQ and Filters are switched in and out of the signal path using the IN buttons in each section.

Switching EQ and Filters Into Channel Dynamics
The DYN buttons allow the EQ and Filters to be switched in and out of the dynamics of the assigned channel instead of the channel itself.

Alternate EQ
The ALT EQ FLTR button allows switching between two complete sets of EQ and Filter controls.

EQ Flat
EQ FLAT will clear any EQ settings to flat. The button must be pressed and held down, this prevents against accidental flattening of settings.

DYNAMICS



The Dynamics section of the module controls the compressor and expander or gate on channels and groups, and the compressor on main outputs.

As console processing is not pooled, dynamics can be assigned to every path, without fear of running out.

The currently assigned path's dynamics can be adjusted using the following controls.

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

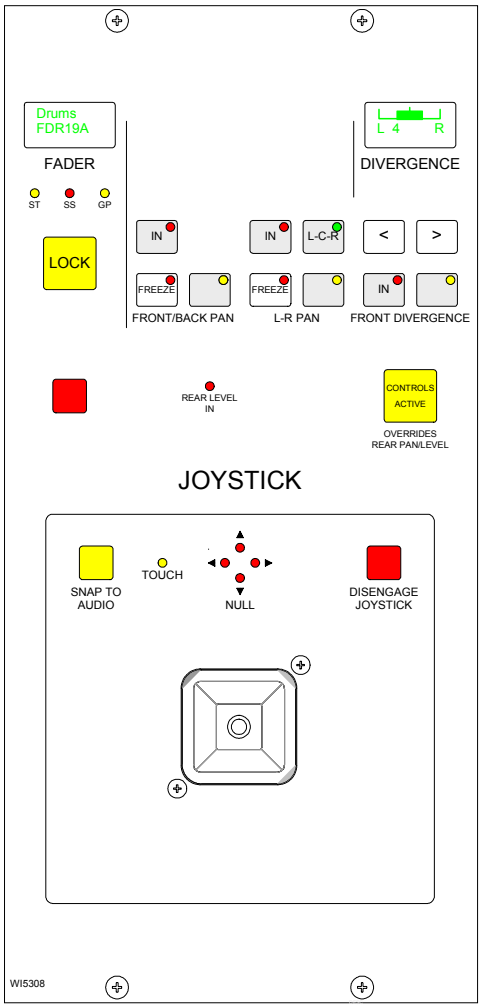
(2) Expander
Threshold 0dB to -40dB
Recovery 75ms to 4 sec + AUTO (Max clockwise setting)
Depth 0dB to 40dB
Fast attack 300µs (normal 16ms)
Ratio 2/1 or SOFT

(3) 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.

(4) Dynamics Linking
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. With the channel selected, press Link 1 or 2 to assign the channel to the bus.

MOTORISED JOYSTICK PANEL



The joystick panel is available as an option, and can be either a single joystick, or twin joysticks. The joystick allows accurate stereo and surround panning of the channel.

The joystick is touch-sensitive, and the TOUCH LED lights when the joystick is touched. In normal operation, the joystick controls the currently selected fader path. 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 and LEDs indicate the type of path being controlled (stereo, surround or 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.

Controls Active

CONTROLS ACTIVE must be selected for the joystick controls to take effect. When 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 their 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 will not take effect. 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

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.

CHANNEL COPY

Nine sections of the currently assigned channel or ALL together can be copied to another channel or channels using this screen.

Use the selection buttons to select the controls you want to copy. Pressing TO FADER (flashes) then allows the destination/s to be chosen. Destinations are chosen by selecting fader assign buttons, or using the ALL A or ALL B buttons. Once all destinations have been chosen, EXEC executes the Copy.

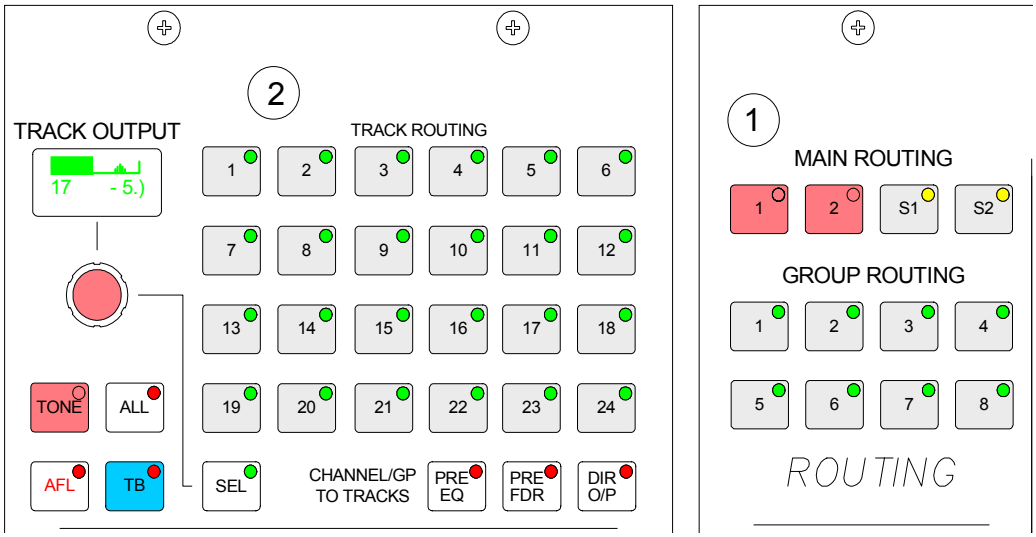
If a stereo channel's settings are copied to mono channels, only the relevant settings are copied. Other settings on the mono channels will be reset to the cleared down state. Any groups or main outputs included in the selected destinations will be ignored.

- I/Ps copies LB, RB, ∅L, ∅R, M/S and balance settings (only ∅ for mono channels) for inputs 1 and 2, and also the input gains, SRC or phantom power when inputs are of the same type.
- EQ and FLTR copy EQ and filter settings (includes IN/OUT, Alternate and CH/DYN settings).
- DYN copies the dynamics settings but not whether the EQ or filters are switched in the dynamics.
- PAN copies pan and width settings as appropriate.
- FDR copies fader and CUT settings, but not PFL/AFL or VCA group assignments.
- RTG copies the routing to main outputs and groups but not the routing to tracks.
- AUX copies the routing and levels to the auxiliaries.
- WILDS copies the Wild assignments but not their settings.
- ALL copies all of the above.

Routing, Auxiliaries, Main Outputs and Console Functions




ROUTING AND TRACK OUTPUT CONTROLS



(1) Routing Buttons

Routes to tracks, groups or main outputs for the currently assigned path can be made or removed by pressing the numbered buttons in the routing section of these panels.

(2) Track Output

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 button 1-24. Tone or Talkback can be fed to the selected track using the TONE and TB buttons. 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.

Global options can be set for how channels and groups feed the track routing selector. Using the selection buttons on the Options-Misc screen, the feed can be pre or post the channel or group pan, and stereo channels and groups can be sent as a mono signal.

Interrogate Mode

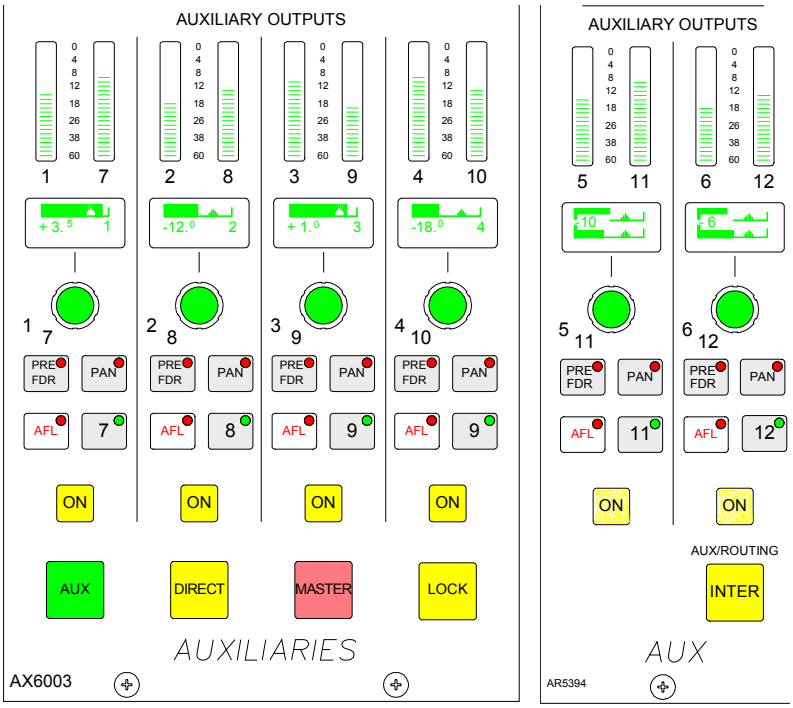
It is possible to discover which fader paths are feeding each of the routing busses by putting the panel into “Interrogate” mode. This is done by pressing the INTER button in the Auxiliaries section of the panel. If any of the routing buttons (groups, mains, tracks) are held down, the fader assign buttons 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

There are 12 mono auxiliary output busses, which can be paired up to be used as stereo auxiliary output busses. The busses are pre-set to be mono or stereo on the USER-BUSSES screen.

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.

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



AUX

Auxiliary Feeds

When AUX is selected, this section of the module controls the feeds from the channels or groups to the auxiliary output busses. The ON button switches the feed from the currently assigned channel or group to that auxiliary output bus. Each feed can be pre or post the channel or group fader, selectable using the PRE button.

If, for example, aux 6 is stereo, then aux 12 will not be available (and aux 12 will not work on the monitor selector). On mono auxiliaries, buttons 7 to 12 switch the control to that numbered aux send. The Pan button will be inoperative.

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.

DIRECT

Aux Direct Inputs

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

MASTER

Auxiliary Outputs

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

LOCK

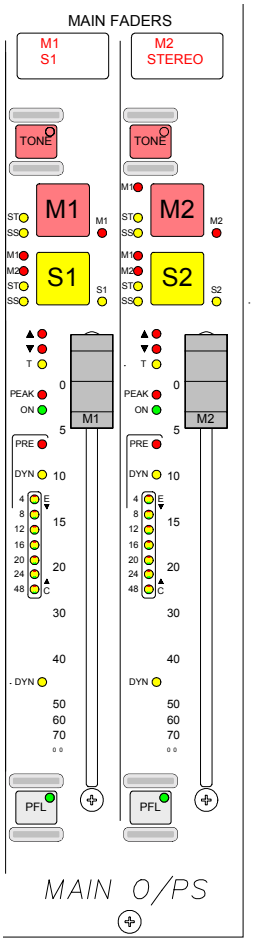
LOCK will lock the panel into output mode. If LOCK is not selected, the panel reverts to Aux if a fader assign button is pressed.

INTER

Interrogate Mode

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. This button can also be used to interrogate routing to group, main and track outputs by holding down their routing buttons, and mix minus feeds using the BUS button on the Input/Output panel.

MAIN OUTPUTS



Like channel and group 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 the path to the Assign Panels to allow:

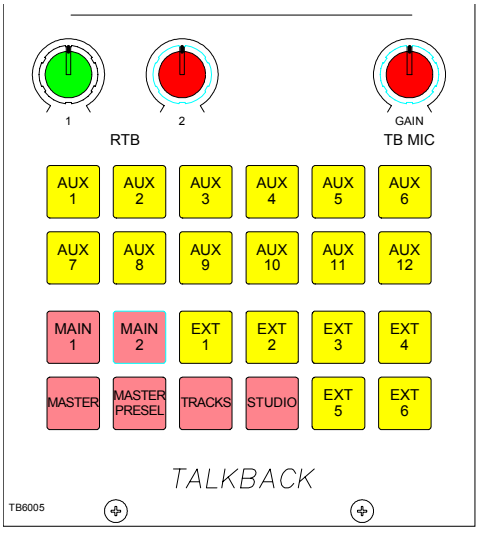
- Routing (of one main to another - indicated on the routing LEDs next to the assign buttons)
- Insert on/off
- Control of the Compressor and direct input

Surround and Stereo Main Outputs

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). If a surround main is routed to a stereo main, the stereo downmix will be routed.

The insert and direct input are also surround.

TALKBACK



Talkback is available on this panel to all auxes, Main 1 and 2, 6 external sources (via GPO switching), all tracks, and Studio.

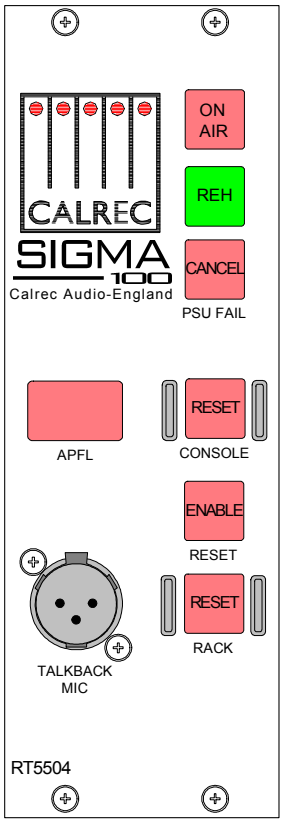
In addition, the MASTER button operates all the TB buttons preselected by the MASTER PRESEL button.

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 using condition switching (TX-REH screen).

The GAIN control sets the level of the TB Mic. 2 rotary controls 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.

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 GPI screen.

The OPTIONS-TX REH screen allows the condition switching for the system to be set up. 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.

Console Reset

Pressing the ENABLE and 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.

Power Supply Monitoring

The rack mounted PSU monitor module monitors the power supplies for failures, and the hot spare will take over if a fault develops. 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 the unlikely event of a second PSU failing, the light will begin to flash again, to alert the user.

Error Messages (AWACS)

If a problem does develop, it will be reported on the AWACS screen. The AWACS icon will flash to draw attention to the report. Selecting the icon switches to the AWACS screen where messages can be viewed. Message history is saved to the PC's hard disk for future analysis.

Three types of messages are reported:

Information messages, eg "The primary core processor has started successfully"

Warning messages, where the system back-up has taken over

Fatal Error messages, where the system cannot recover by itself (perhaps because the back-up is already in use)

Because the system has many back-up features, such as automatic change over to hot spares for PSU's, control cards and DSP cards, it is possible to continue operating after messages are reported.

CONSOLE FUNCTIONS

The console function buttons provide an easy way of clearing down console settings.

CHANNEL CLEAR - Clears the currently assigned channel from all settings apart from the port assignment.

CHANNEL AUX CLEAR - Clears the Auxiliary send settings for the currently assigned channel.

DEFAULT SET UP - Recalls the default set up configuration for the console, replacing all settings.

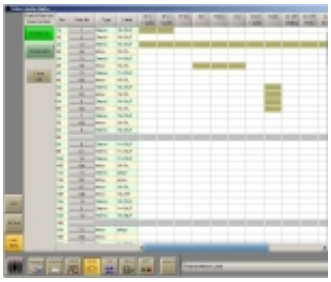
The default set-up will usually be created upon installation of the console using the TECH-INFO screen. This is a default memory, which could contain the fixed port set-ups which match the studio wiring, and any other settings which hardly ever change. It could have all channel settings OFF or flat,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

GLOBAL CONSOLE CLEAR - Clears the console of all settings

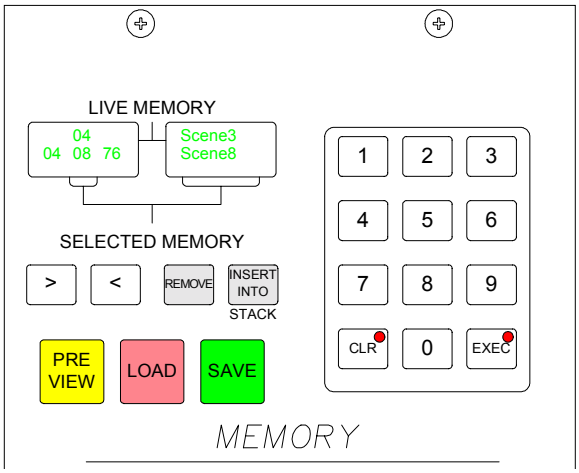
REPLAY - This button is not used.

Clear, Aux Clear, Default Set-up and Console Clear flash when pressed and require the EXEC button to be pressed before the operation is carried out. It is recommended that settings are saved to memory before these functions are used.

Memory System


MEMORY SYSTEM



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 called into the Flash ROM quickly and easily. Memories can be stored to removable media. This can be useful for when many different operators use the same console, or when the console is used to broadcast many different weekly productions.

Live and Selected Memories

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 shows the last memory loaded onto the console. Changes made since this memory was loaded will not be stored in this memory number unless it is re-saved. They will however be stored in the “Hidden” memory so that they are restored after a power down.

The buttons on this panel will affect 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 settings.

Choosing the Selected Memory

The keypad allows any memory number to be called into the Selected Memory position. Enter the two digit memory number followed by EXEC on the keypad to call that memory number into the Selected Memory position. In addidtion, selecting the required memory in the Flash ROM list on the left of the Memory screen will call it into the Selected Memory position.

Saving Memories

SAVE + EXEC will save console settings to the memory occupying the Selected Memory position. Alternatively, SAVE+Memory Number + EXEC will save into that memory number.

To create a new memory, choose an empty memory either by selecting it from the list on the left of the Memory screen, or by typing its number on the keypad. Memories can be given a user-friendly label.

Preview Memory

When the Preview button is held down, the Selected Memory settings will be displayed on the control surface without actually changing the current settings. The Assign panel displays will be blanked out. Upon release of the Preview button, the control surface will display the live settings 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. Stacks can be saved to the hard disk or removable media as sessions on the MEM-SETUP screen. INSERT INTO STACK adds the Selected Memory to the stack. The > and < buttons scroll through the stack.

MEMORY SET UP SCREEN

The Memory Setup screen duplicates the memory functions available on the control surface, and allows management of stored memories and stacks. The two memories either side of the Selected Memory in the stack will appear in the windows either side of the Selected Memory window. With the Auto > or Auto < check box ticked, the next memory in the stack will move to the Selected Memory position after the previous Selected Memory has been loaded.

All the available Flash ROM memories are listed on the memories screen, and when selected will occupy the Selected Memory position. To create a new memory, choose an empty memory from the list. When SAVE is selected to save the new memory, it can be given a label. The contents of the Selected Memory can be cleared by selecting Clear Memory.

When loading, saving or clearing memories from the screen, a confirmation box must be accepted before the action is carried out. This prevents memories from being accidentally overwrittten, cleared or loaded onto the console at an inappropriate time.

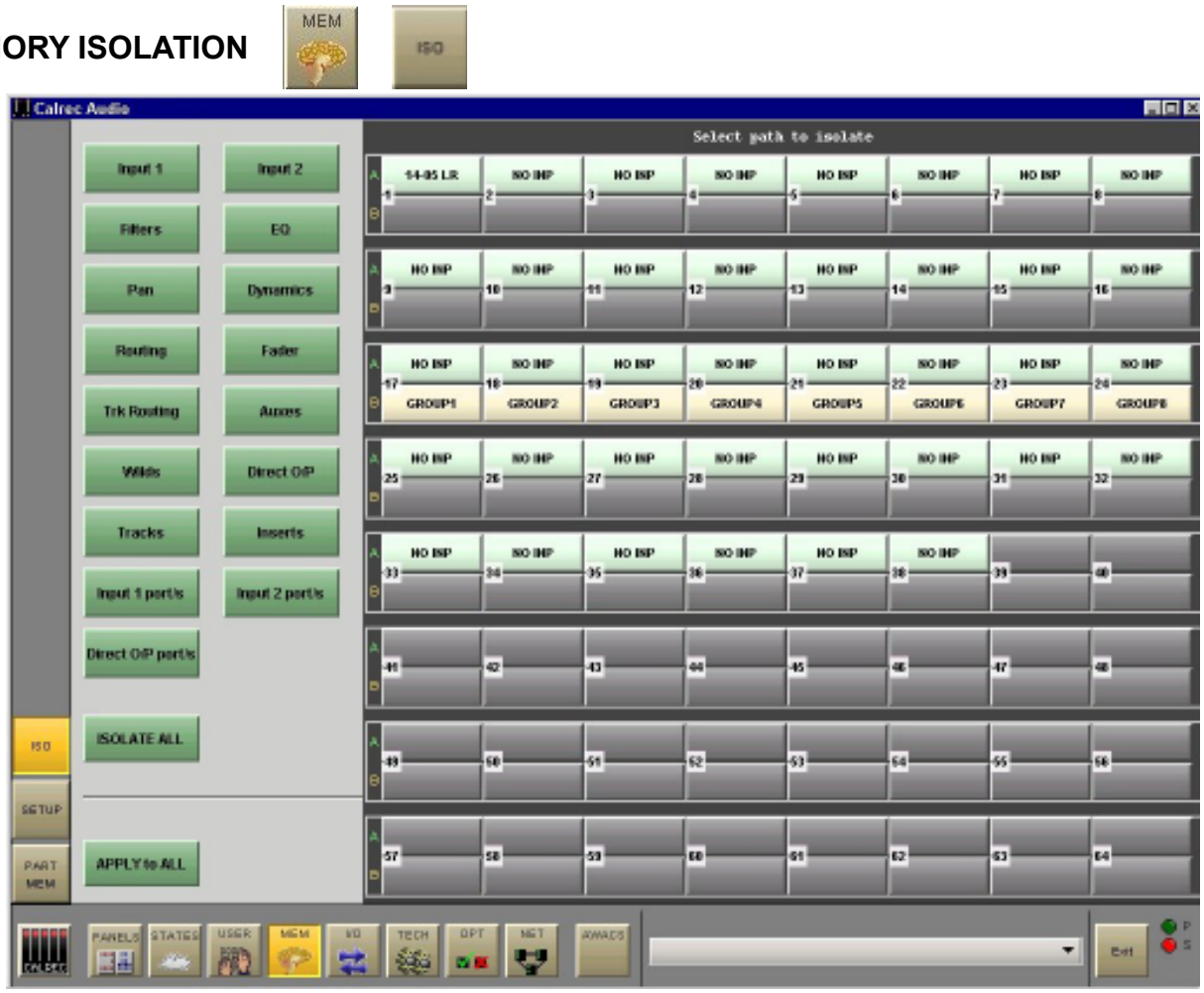
Managing Memories in the Flash ROM List

It is possible to back up all memories to the hard disk by selecting “Backup Memories”. Previously backed up memories can be restored from the hard disk or other media into Flash ROM by selecting “Restore Memories” . Memories can be re-named by selecting “Re-Label Memories”. Selecting “Clear All Memories” will remove all memories from the Flash ROM.

Sessions

Stacks can be saved to the hard disk or removable media as sessions. Selecting “Back Up Session” backs up the stack and all the memories in it. “Restore Session” allows previously backed up sessions to be restored. “Clear Stack” will remove all memories from the stack.

MEMORY ISOLATION



The Isolate screen allows some console settings to be isolated from memory recall. This means their current settings will not be over-written when a different memory is loaded.

The right side of the screen shows all fader paths. Paths can be selected from here or by pressing the fader assign button. The buttons on the left side of the screen allow settings for the selected path to be chosen for isolation. ISOLATE ALL selects all the settings to be isolated for the selected channel or group.

APPLY TO ALL applies the selected isolation settings to all channels and groups. To clear all isolation settings from all channels and groups, ensure all settings are de-selected, and select APPLY TO ALL.

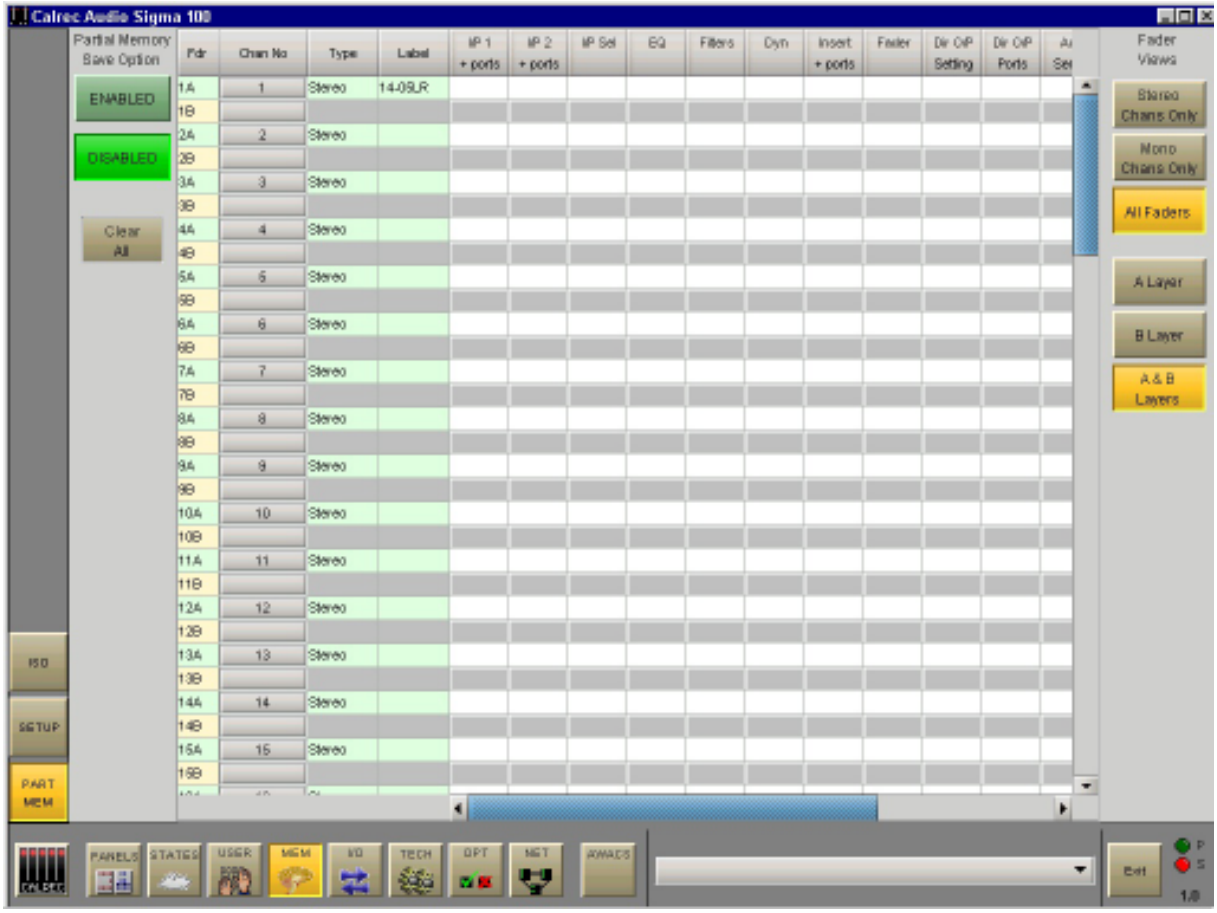
When an input is isolated or de-isolated, its port will also be isolated or de-isolated. However, the I/O screens allow port isolation to be turned on and off independantly. Isolated ports are highlghted in brown on the I/O screens.

If an isolated port connection is changed, any isolation setting will be cleared, unless one of the console-wide isolation options is selected and contains that port.

If an output connection in the memory cannot be made because it needs to use an isolated port, this will be reported via AWACS.

PARTIAL MEMORIES

The Partial Memories function allows components of console settings to be saved in the same way as full console memories. When a partial memory is recalled, only the settings saved will be updated. The partial memories screen provides a mechanism for selecting channels or sub-components of channels to be saved in a partial memory.



Partial Memories mode is enabled and disabled using a button on the partial memories screen. When enabled, all memory saves are partial memory saves. When disabled, all saves are full console saves. Once partial memory mode is active, the save buttons on the screen and control surface are used to save partial memories in the same way as full console memories.

The partial memory screen contains a table with rows of channel numbers and columns of partial memory components. The sequence of the channels is in fader number order. Partial memory component selections are made by selecting the intersection of a channel and a console setting. The Channel Number field in the fader table is a selectable button, which selects or deselects ALL partial memory components for the channel occupying that fader.

Partial memory selections are stored and recalled if a console reset occurs.

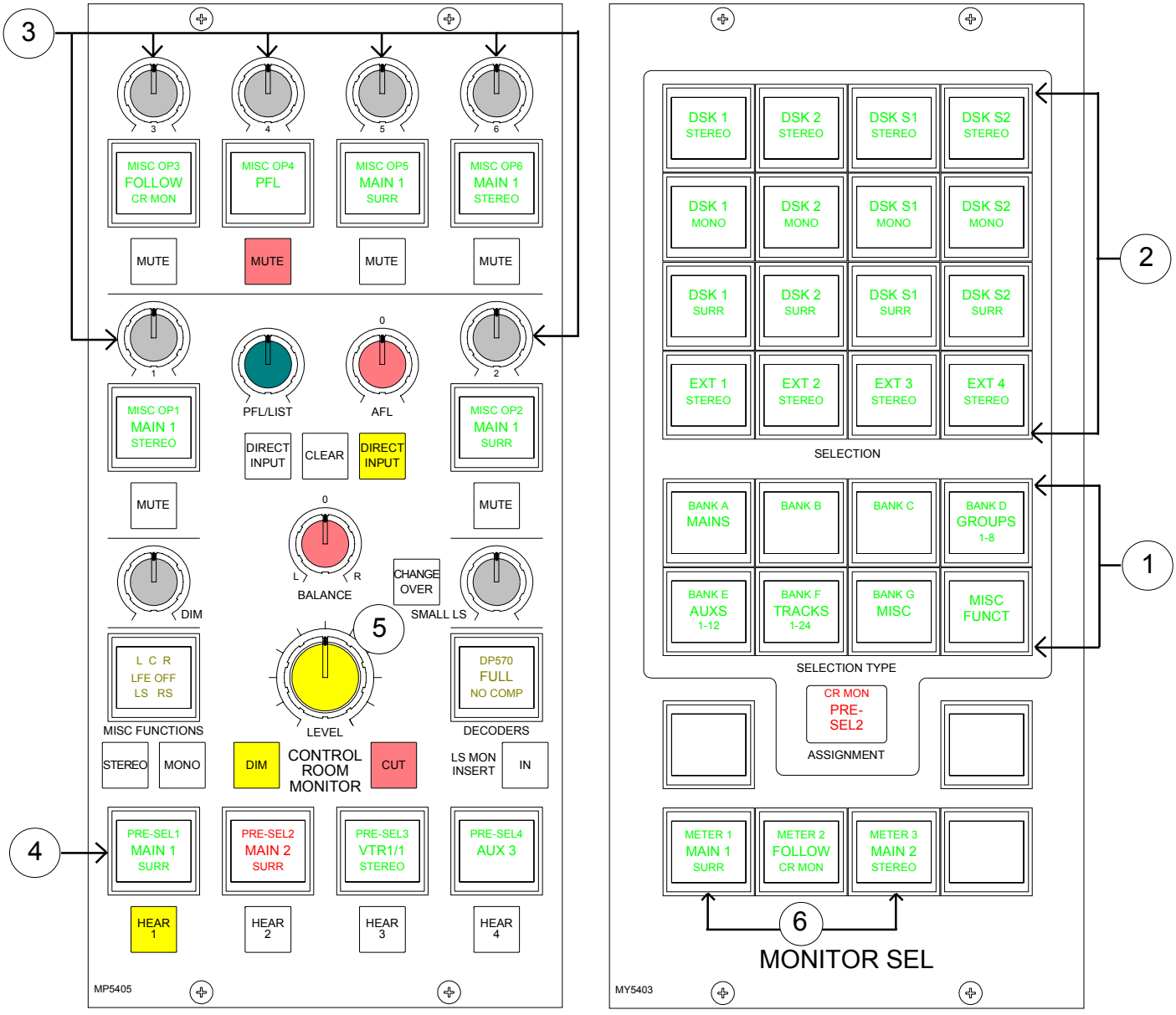
A partial memory only loads those channels or components on the control surface that were selected using the partial memory selections. A partial memory load does not affect the currently assigned fader and the A/B layer assignments.

Monitoring System




ASSIGNABLE MONITORING, METER SELECT AND LS CONTROL

The assignable monitor panels are available as an option. As an alternative to the standard monitor panels, they offer a higher degree of flexibility and user-definability. Each monitor output can select the source to monitor from all the available sources, independantly of the other monitor outputs. The sources are selected from a programmable set of selection buttons on the second panel. Each monitor output has a button incorporating a display, on which the currently assigned source label is shown.



(1) Selection Banks

All of the monitor sources can be grouped into 7 banks, with up to 16 sources in each bank. Banks A to G are user-definable using the Options-Mon I/P and TB screen. An eighth bank allows miscellaneous functions to be applied to the selected output, and is not editable. Pressing the bank selection button will change the 16 source selection buttons to display the sources allocated to that bank.

(2) Monitor Source Selections
There are 16 selection buttons. These can display the available monitor sources or functions allocated to the selected bank.

(3) Misc Outputs
There are 6 misc outputs to which monitor sources can be assigned. Each misc output can be given a suitable name during the set up of the console. This name will then appear on the button display, and on the front end screens. Misc outputs 1 and 2 can be stereo, 3 stereo, or 5.1 independently. Misc outputs 3, 4, 5 and 6 are stereo only. Pressing the button selects the misc output, and its display will be highlighted in amber. With the misc output selected, simply select a monitor source from the monitor selector panel to assign that source to the misc output. The currently assigned monitor source (and its bank) will also be highlighted in amber on the Monitor Selector Panel.

(4) Control Room Pre-Selects
There are 4 Control Room Pre-select buttons, where monitor sources can be assigned. This allows 4 sources to be preset ready for immediate listening on the main control room loudspeakers. Two of the buttons could be used for A/B comparison, whilst the main output is always available on one of the other buttons. With a Control Room Pre-select button selected, press the required monitor source from the 7 banks of 16 monitor sources on the Monitor Selector Panel to assign the source.The source label will be displayed on the button. The HEAR button below each Control Room Pre-select button allows the user to listen to the assigned source on the Control Room Monitor. The HEAR button will illuminate to show which Control Room Pre-select is currently being monitored.

(5) Control Room Main and Small LS
The SMALL LS level control is in series with the Main LS level control. This allows the Main LS level control to be used irrespective of which LS system is in use. The Small LS level control is used to adjust for the difference between the two sets of LS. The CHANGEOVER 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 and SOLO operate on both sets of loudspeakers. DIM and CUT can be externally operated. DIM can be controlled from the TB if it is set to do so using the condition switching on the Options TX-REH screen.

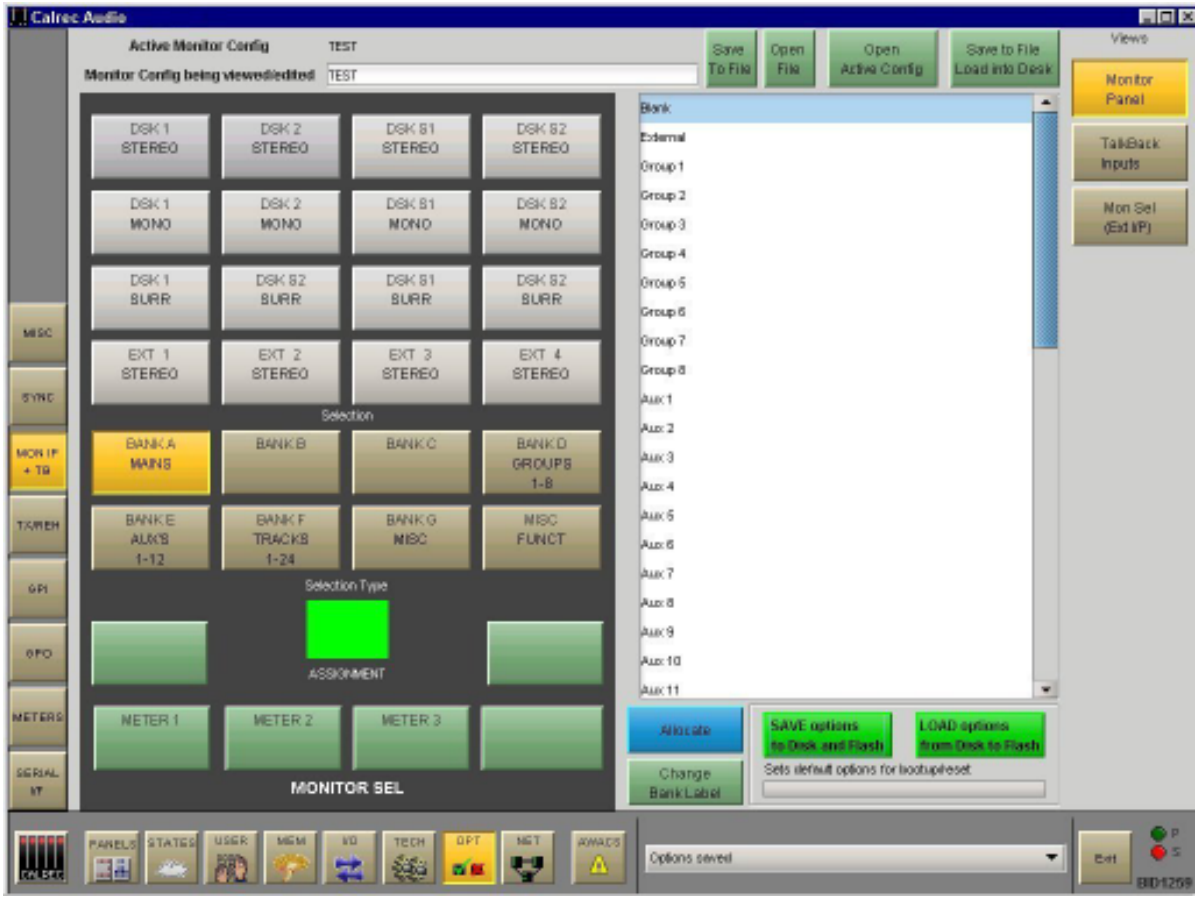
(6) Meter Selectors 1-3
Any of the available sources can be assigned to 3 meter selectors 1, 2 and 3.

With any of the meter buttons selected, pressing misc functions (bank 8) allows Tone and M/S to be selected for that meter. Meters 1-3 have an optional separate M/S (L-R sum/difference) meter.

Meters 1 and 2 can be stereo only, surround only, or surround plus stereo. Meter 3 is stereo only. When metering surround signals, Meter 3 displays the stereo downmix.

Assignable Monitor Panel Setup Screen

The screen allows all the available sources to be allocated to 7 banks of 16 selection buttons. This means that sources of the same type can be banked together for ease of access. Each external input's selection button can be given a user-definable label which will appear both on the screen and on the button's display.



The left side of the screen shows a representation of the monitor selection panel. The right side of the screen lists all the available monitor sources. Monitor sources are allocated to the 16 selection buttons on each bank as follows:

- Select the required bank (The selection buttons on the screen will change to the current button settings for that bank).
- Select the button to which you want to assign a source (screen button will flash)
- Select the required monitor soure from the list
- Select "Allocate" 

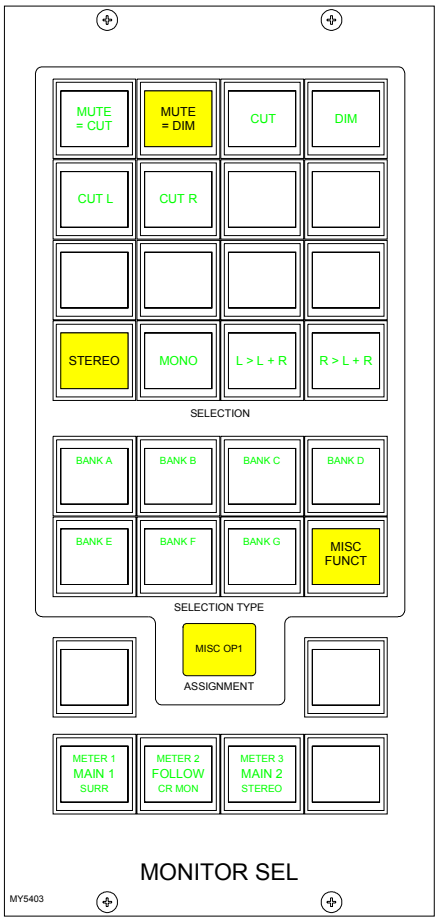
For External sources, a pop up window allows the user to enter a suitable label for the button, and allows the user to choose whether the source is mono, stereo or surround.

Each bank can be given a user friendly label using this screen. Select a bank, and then select the "Change Bank Label" button. Labels for the middle and bottom rows on the button can be entered. The top row will always display the bank number.

Once the user has the Assignable Monitor Panels set up as desired, the monitor configuration can be given a name and saved to the PC's hard disk, so that it can be recalled at a later date. Changes to the monitor configuration will not take effect until SAVE TO FILE LOAD INTO DESK is selected. Then the changes will be loaded onto the panels and saved.

Misc Output Misc Functions

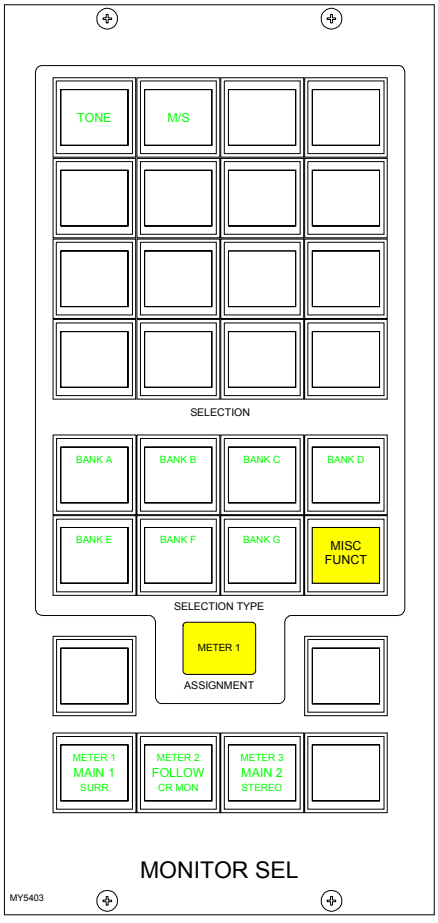
When a misc output is selected, the misc functions bank allows the following functions to be applied.



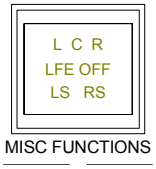
- The Mute button for each Misc output can be set to CUT or DIM the selected monitor source using the MUTE=CUT or MUTE=DIM buttons. The button will light red when set to cut, and yellow when set to dim.
- CUT and DIM can be applied using the buttons here.
- CUT L and CUT R allow the left or right leg of the selected monitor output to be cut.
- Stereo or mono buttons allow the misc output to monitor the source in stereo or mono.
- L > L + R and R > L + R allows either the left or the right leg to be sent to both the left and right of the stereo output.

Meter 1-3 Misc Functions

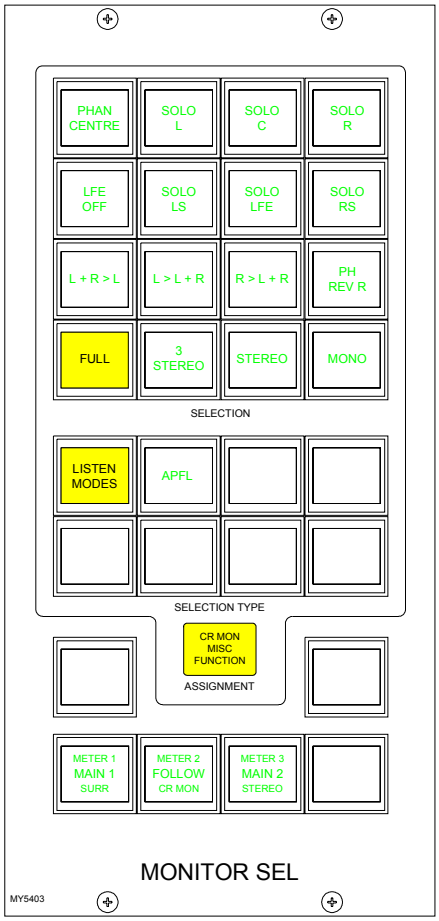
When meters 1-3 are selected, the misc functions bank allows Tone and M/S (L-R sum/difference) to be selected for that meter.



Control Room Miscellaneous Functions



The Control Room Misc Functions selection button allows listening modes to be applied to the Control Room monitor, and APFL functions to be set up. Pressing this button gives access to functions displayed on the Monitor Selections panel. The Listen Modes and APFL functions are located in two seperate banks, and are chosen in the same way as monitor sources.



Listen Modes

The default listen mode is mono, stereo 3 stereo or full surround depending on the LS arrangement set in the Set up application. The selection buttons are as follows:

- Selection buttons to switch PHAN CENTRE on, and LFE off.
- 6 solo buttons allow solo monitoring of each component of a surround signal.
- 4 stereo option buttons: L+R to L, L to L+R, R to L+R and PH REV R. These will work in any mode, but are really designed for use in stereo mode or when monitoring stereo sources.
- 4 Listen mode selection buttons, allow the Control Room to monitor its selected source signal in Full surround, 3 STEREO, STEREO or MONO.

3 STEREO with Phan Centre ON is the same as STEREO except the LFE is optional.

If the source being monitored is surround, the STEREO button will create a stereo downmix of that source. If the source is stereo, the surround monitor buttons for that main output will have no effect.

MONO feeds L, C, R, LS and RS to L and R.

APFL

There are selection buttons for:

PFL to override each misc output 1-6

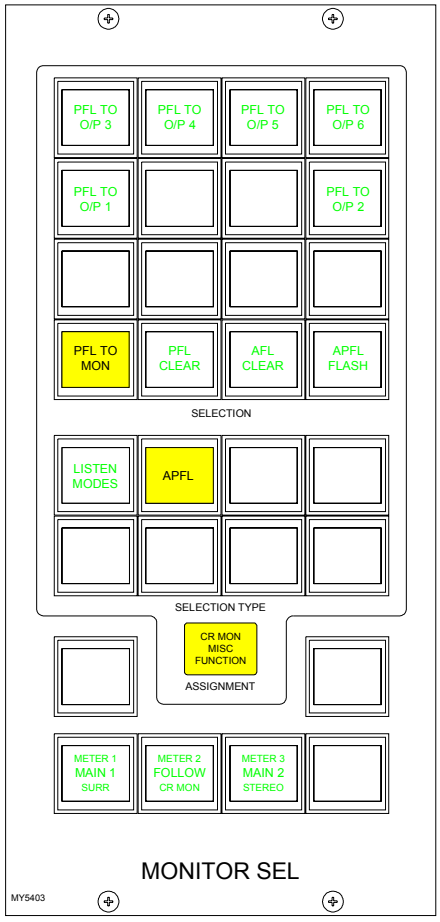
PFL to MON - Feeds the Control Room LS outputs overriding the current LS selection.

PFL clear and AFL clear, clear any latched buttons.

APFL Flash sets the APFL light to flash when any of the AFL or PFL buttons are latched.

PFL from surround mains is a stereo downmix of the surround signal.

If PFL to MON is not selected, PFL can override the small LS (if it has been set to do this in the setup application). Alternatively, there can be a separate stereo PFL LS output. An external RTB input can mix with PFL to the PFL LS output.



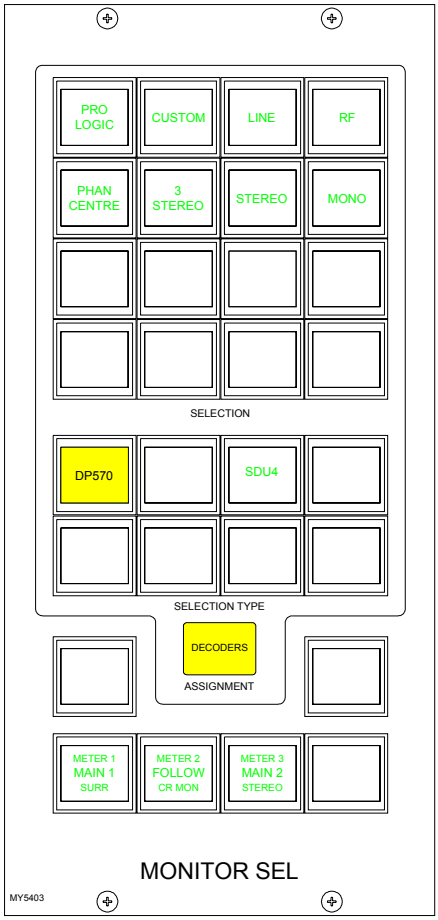
Decoder Remotes

The Decoders selection button allows any decoders which are installed to be controlled. Pressing this button allows the user to select a decoder, and gives access to decoder remote functions displayed on the Monitor Selections panel. The different types of decoder are located in seperate banks, and functions are chosen in the same way as monitor sources.

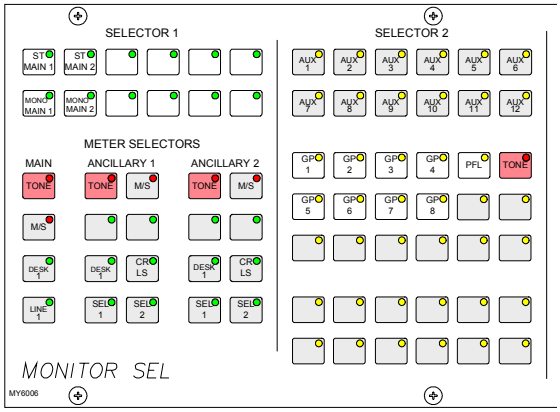
The decoder function buttons are as follows:

- 1 button for Pro Logic mode. When using a Dolby DP570, it is assumed that it will be set to Dolby Digital mode either in manual or auto detect mode.
- 3 buttons for Alternate Compression Modes: CUSTOM, LINE and RF. If none are selected, there will be no compression and no dialogue normalisation.
- 4 buttons for Alternate Output Modes: PHAN CENTRE, 3 STEREO, STEREO and MONO. If none are selected, the output will be full surround.

When controlling a Dolby SDU4, LT/RT decoder, only the stereo and mono output mode buttons will function.



ALTERNATIVE MONITOR PANELS



There is an alternative monitor panel available, which can be either landscape or portrait to fit the console layout.

Monitor Selector

The Monitor Selector is used to select the source to monitor. Selectors 1 and 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 the left and right.

The Options-Mon I/P & TB screen is used to allocate monitor sources to the user-definable selection buttons on this panel. Buttons can only be assigned when in Technician or Supervisor mode. This allows the system to be set up prior to operation, and protects against accidental changes once the console is in use.

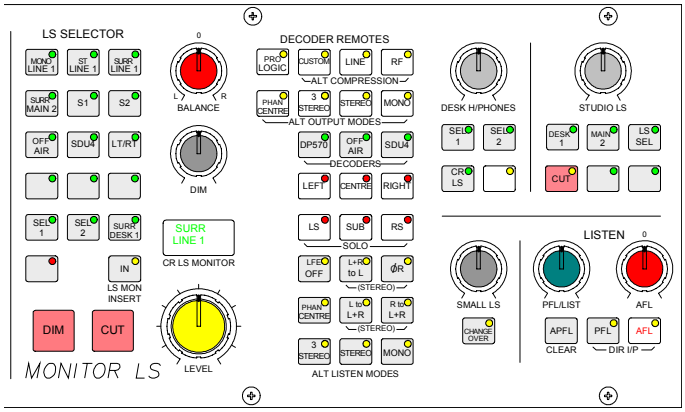
Meter Selectors

The meter selector is used to select the source for the Main and Ancillary meters. The main meter is in addition to the four stereo main output meters, which display the stereo downmix of the main output, if the main is surround. The Ancillary 1 meter would normally be used to meter the Control Room LS monitor selection, but can also be selected to Main 1 Desk, Sel 1 or 2, or 2 external inputs. The Ancillary 2 meter can be selected to meter the Control Room LS monitor selection, Main 1 Desk, Sel 1 or 2, or 2 external inputs.

Both the Main and Ancillary 1 meters can both be stereo only, surround only, or surround plus stereo, with an optional separate M/S (L-R sum/difference) meter. The Ancillary 2 meter is stereo only with an optional separate M/S (L-R sum/difference) meter. When metering surround signals, it displays the stereo downmix.

Tone switches allow tone to be sent to each meter.

Monitor LS



The SMALL LS level control is in series with the main LS level control. This allows the Main LS level control to be used irrespective of which LS system is in use. The Small LS level control is used to adjust for the difference between the two sets of LS. 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 and SOLO operate on both sets of loudspeakers. DIM and CUT can be externally operated and controlled from the TB if they are set to do so on the Options - TX/REH screen.

If a surround signal is monitored on a stereo loudspeaker or meter, a stereo downmix will be created and monitored. If the LS system is surround, stereo and mono sources will be heard in stereo and mono, with no signals on the other speakers. If a main output is surround, the stereo monitor buttons for that main output will monitor its stereo (downmix) output. If a main output is stereo, the surround monitor buttons for that main output will be disabled.

For STUDIO LS, two parallel LS outputs are provided, post the level control, with separate MIC OPEN cuts. Studio LS 1 can be either stereo, 3 stereo or 5.1. Studio LS2 is stereo only.

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 designed for use in STEREO mode or when monitoring stereo sources. MONO feeds L, C, R, LS and RS to L + R.

AFL and PFL

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.

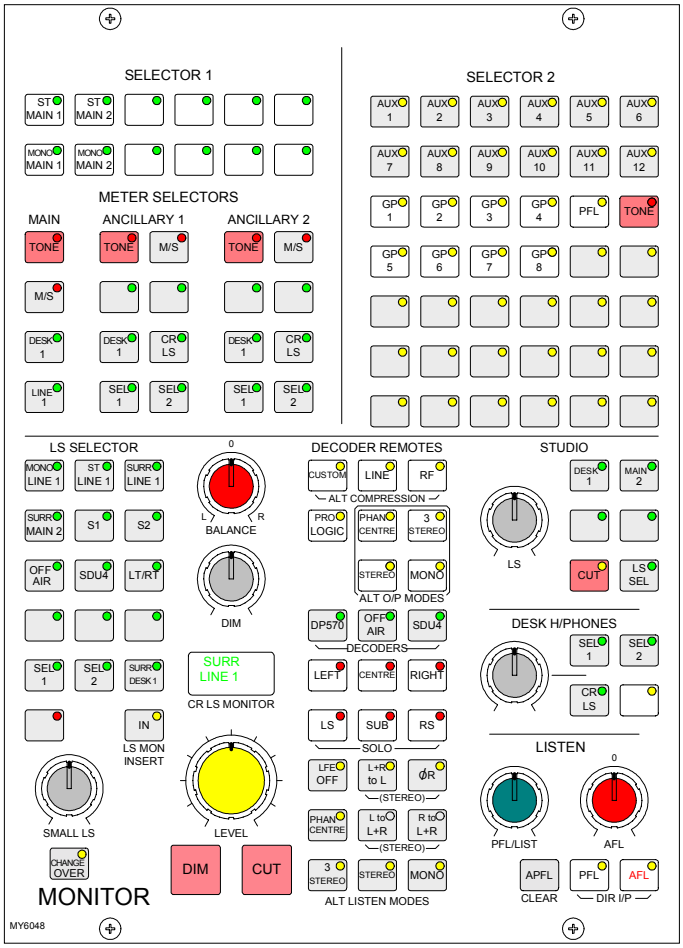
Decoder Remotes

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.
- For a Dolby SDU4 LT/RT decoder, only the stereo and mono output mode buttons will function.

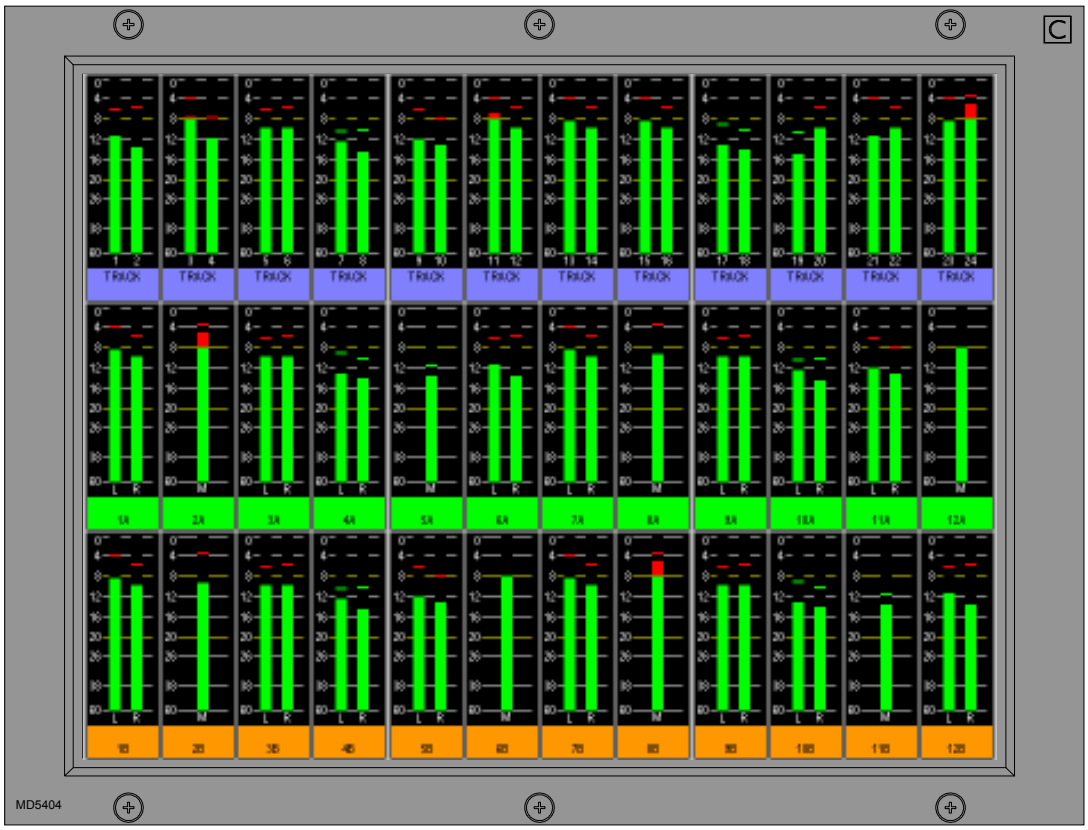
Portrait Monitor Panel

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



Metering System

TFT METERS



The console can have up to 16 high quality TFT screen based meters incorporated into its upstand, either instead of, or alongside the existing bargraph, moving coil VU and PPM meters. These TFT panels allow a greater density of meter functions to be displayed, and the user can dynamically change the meters and their arrangement using the Options-Meters screen. Meter configurations can be saved and recalled, so that different users can have their own preferred meter arrangements. Each meter can be mono, stereo, M/S, Surround, or phase display, and the following functions can be metered:

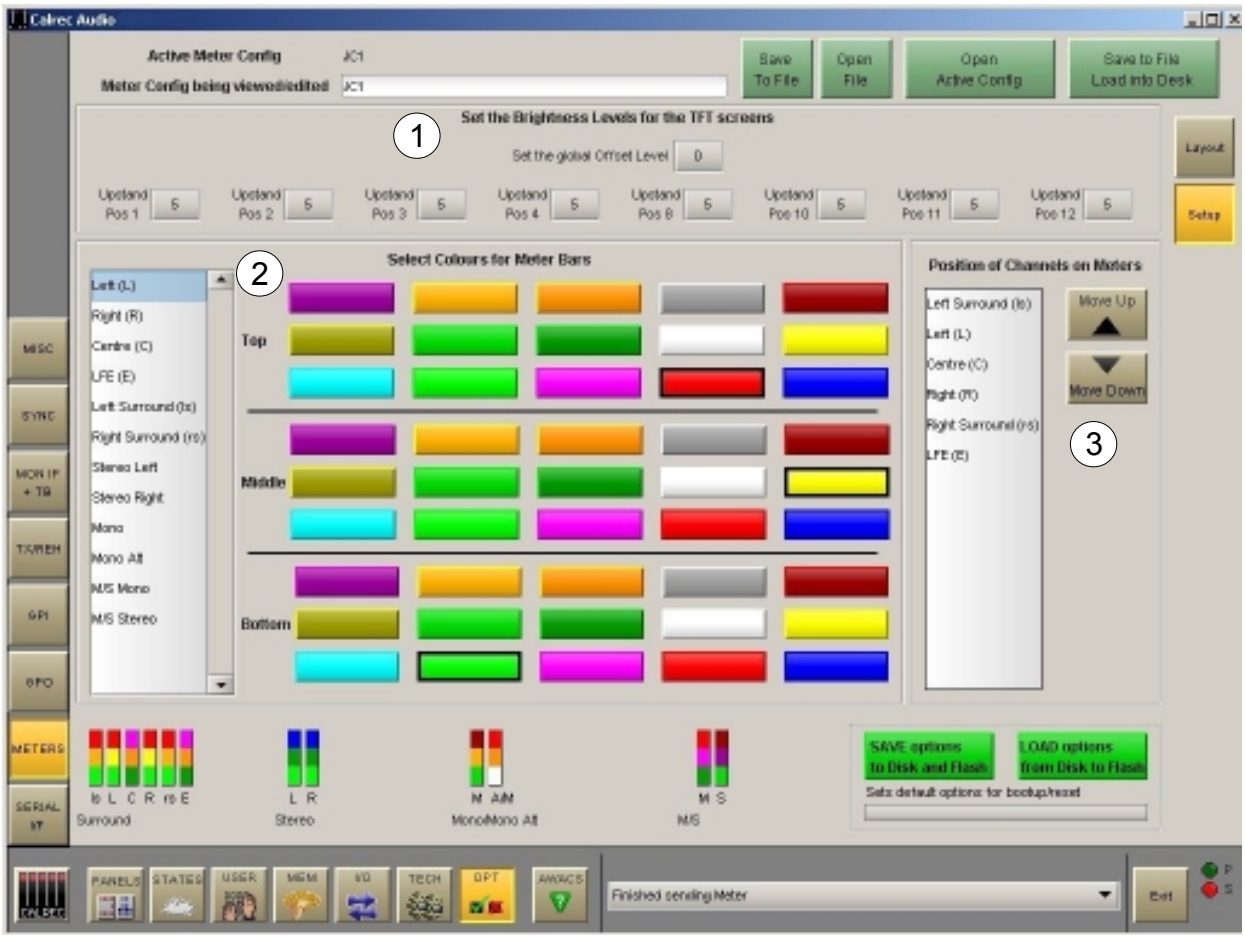
- Channel inputs, A and B paths (simultaneously, or set to follow A/B assign button).
- Main Outputs
- Group Outputs
- Track Outputs
- External Inputs
- Auxiliary Outputs
- Meter Selectors
- Miscellaneous functions

The screen layout is configured in halves, such that each half of the screen can have 4 or 6 columns, allowing 8 or 12 meter positions across the width of a TFT meter screen. Each column can then be split into up to three rows to contain meter positions which can be 1/3, 1/2, 2/3 or full height of the TFT meter panel. Therefore, Each TFT meter screen can display up to 36 meters within the space usually taken up by just two standard meter panels. When a screen is configured with 8 columns, these columns will line up with any channel or group faders positioned in that section of the console.

The number of meters configurable on the TFT screens is governed by the number of meter data signals available. There are 122 meter data signals available for output meters. In addition, for input meters, there is one meter data signal per audio signal. If an audio signal is metered on a TFT meter and a standard meter at the same time, it will use up two signals in the meter data stream.

TFT Meter Setup Screen

The Setup screen contains options to set global metering settings.



(1) Screen Brightness

Over time, the brightness of TFT screens can degrade. For this reason, a set of controls are provided to adjust the brightness of each screen individually and globally. The screen in each upstand position can be adjusted from 0-9 using the selection buttons(0 is off). A selection window will appear with the current level highlighted. Selecting a different level will close the window and the new level will be shown on the screen. The global offset level will adjust the brightness of all screens by the value selectable in the same way, from -5 to +4.

(2) Bar colours

The user can select the colours to be used on the meters. The top,middle and bottom colours for each signal can be selected independently using the pallette. The selected colours for each signal are shown at the bottom of the screen.

(3) Signal Order

The user can select the order that the surround signals appear. The order can be shuffled by selecting a signal from the list and using the Up and Down buttons. The order chosen will be used for all surround meters.

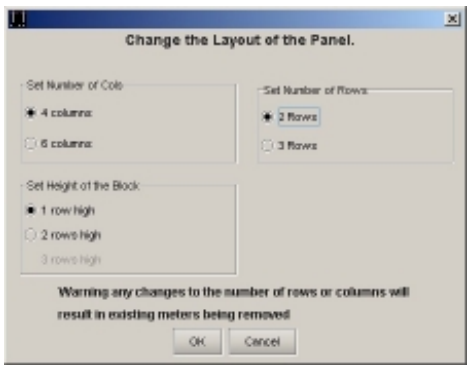
TFT SCREEN LAYOUT CONFIGURATION

The user can control the layout of the rows and columns on the TFT screens. The numbered buttons allow the meter in that upstand position to be selected for set up.

Select a meter position (its background turns blue), and select CHANGE LAYOUT. A dialogue box then allows the number of columns and rows in the selected meter's half of the screen to be chosen. The meter's height can then be set to span the available rows.

Rows

Each half of the screen can have two or three rows, and the meters within each column can be set to take up 1, 2 or 3 rows, to achieve different row heights for different columns. Changing the number of rows only affects meters in the selected meter's half of the screen.



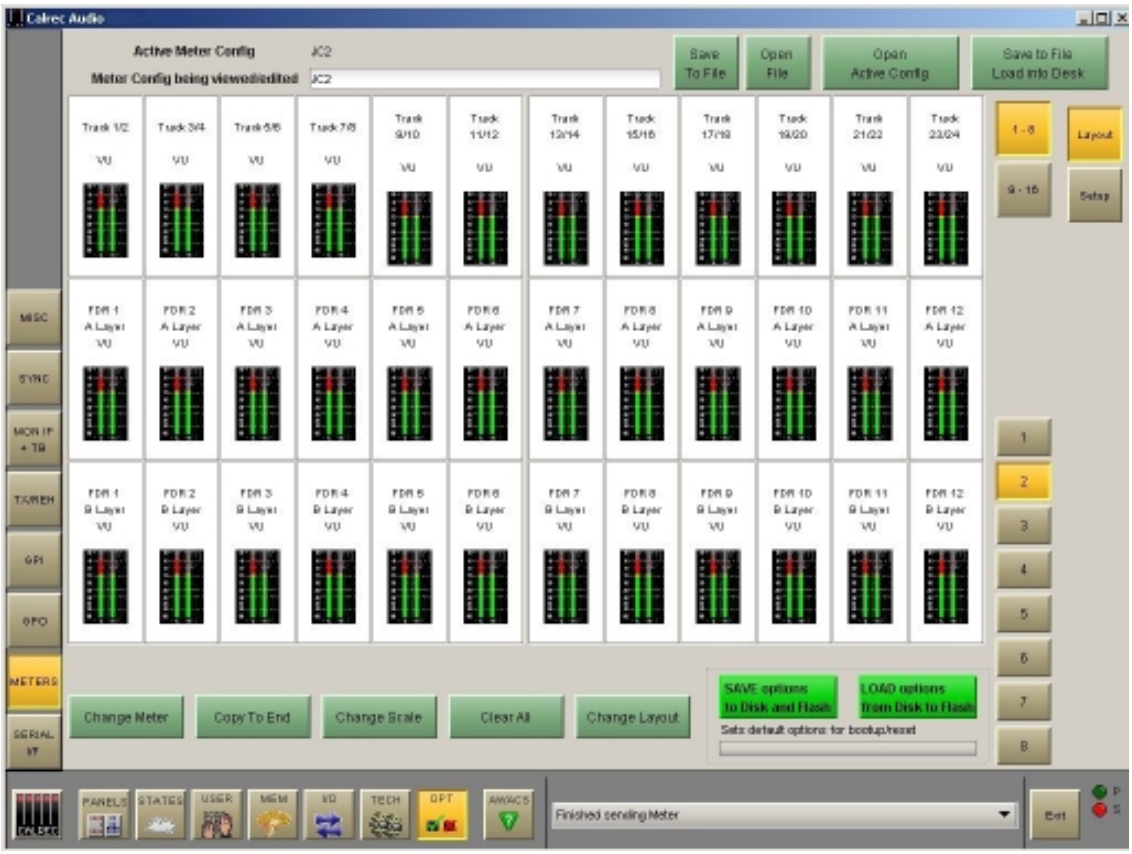
Columns

There can be 4 or 6 columns in each row across each half of the screen. As the screens are set up in halves, there can be different column widths on each side of the screen. Changing the number of columns will affect the selected meter's row only (unless the change affects meters already set on other rows). This allows rows to have different numbers of columns.

Block Height

In a column with 2 rows, selecting 1 row high makes the meter take up half of the column it occupies. Selecting 2 rows high makes the top meter position take up the full height of the column it occupies. In a column with 3 rows, selecting 1 row high makes the meter take up one row (1/3 of column height) in the column it occupies. Selecting 2 rows high allows the meter to take up the row it is on and the row below in its column. 3 rows high makes the meter the full height of its column.

METER CONFIGURATION



Change Meter

Sources are allocated to TFT, bargraph or moving coil meters in the same way. Select a meter position (it's background will turn blue) and select CHANGE METER. A dialogue box will appear which allows the meter source to be chosen. Subsequent columns will list the available options for that source. When selecting channel inputs to be metered, the fader number is selected, and the path A or B. Alternatively, the meter can be set to follow the currently assigned fader path.

Copy to End

If a source has been allocated to a meter, and that meter is selected, COPY TO END can be used to allocate subsequent sources in the list to all the meter positions to the right of the selected meter position in the row, until the row is full, or you run out of sources in the list.

Change Scale

Each meter can be PPM, VU or Phase. There can be up to 3 phase meters assigned in the configuration. The scale type can be selected individually for each meter or globally for all meters.

Clear All

CLEAR ALL resets all the meter positions, clearing all meters in the upstand. A confirmation box must be accepted before this action is carried out, to prevent against accidental changes.

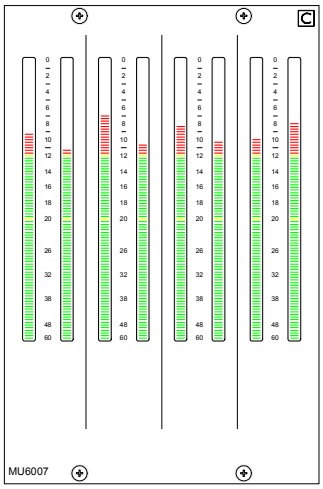
Change Layout

CHANGE LAYOUT is used to configure the layout of the TFT screen.

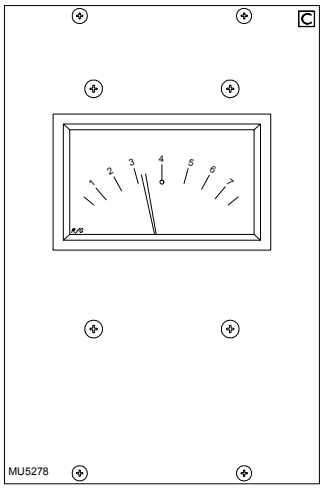
Saving and Restoring Meter Configurations

Once the user has the meters set up as desired, the configuration can be saved to the hard disk, so that it can be recalled at a later date. Changes to the configuration being viewed/edited will not take effect until SAVE TO FILE LOAD INTO DESK is selected. Then the changes will be loaded onto the console and saved.

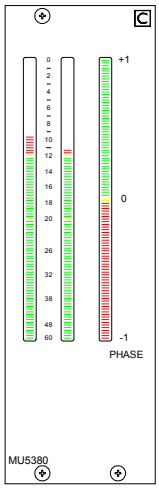
BARGRAPH AND MOVING COIL METERS



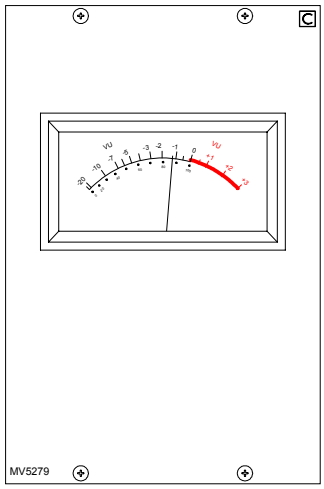
4 x Twin Bargraph



PPM Meter R/G (A/B)



Phase Meter Bargraph & Stereo Bargraph

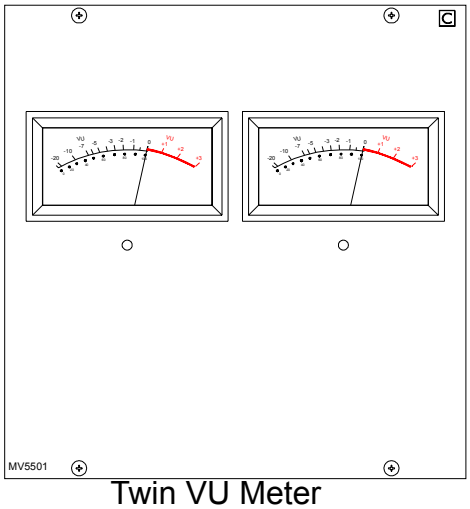


VU Meter

Sources are allocated to bargraph and moving coil meters using the Options-Meters screen.

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 PPMs, VUs, 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 and TB), Main 1 or 2 Line (which can be an external input), or Tone.



Twin VU Meter

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 andTalkback
- ANCILLARY 2 Meter: This is stereo only. It can be PPMs, VUs 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: Displays signal on the mix minus bus (mono)
- GROUPS: 8 stereo bargraphs for the groups. For mono groups, the left bar only will display

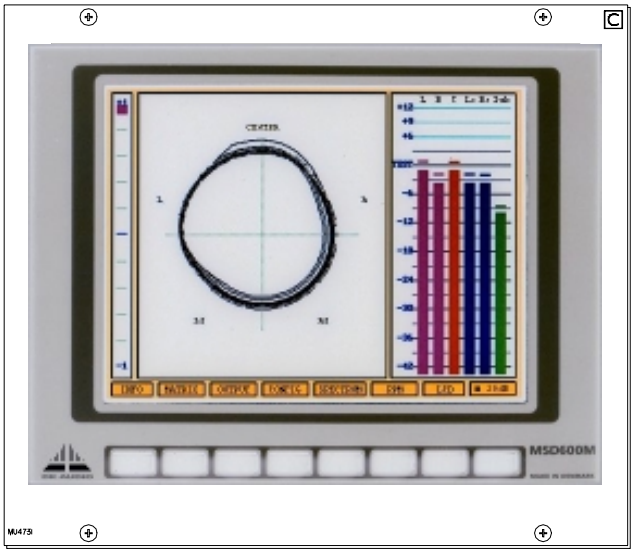
All Calrec meters including moving coil types, are fed directly from the meter processor. There are external meter outputs which allow other meters to be used.

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.

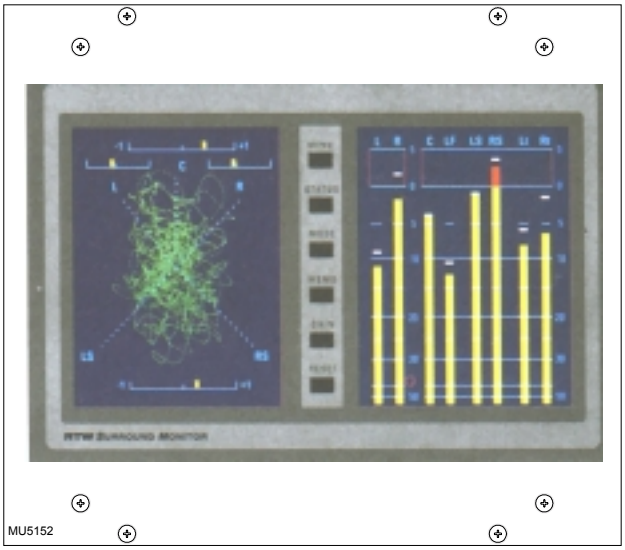
The meter bridge is continental height allowing alternative European bargraph meters to be fitted. These would require audio outputs from the I/O Rack.

OPTIONAL THIRD PARTY METERING

It is possible to incorporate third party metering options into the console’s upstand, this would require audio outputs from the I/O Rack.

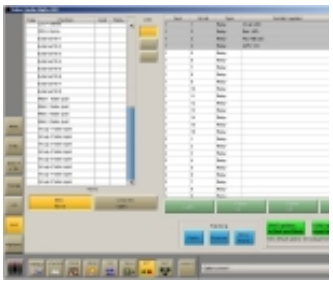


DK Audio MSD600M

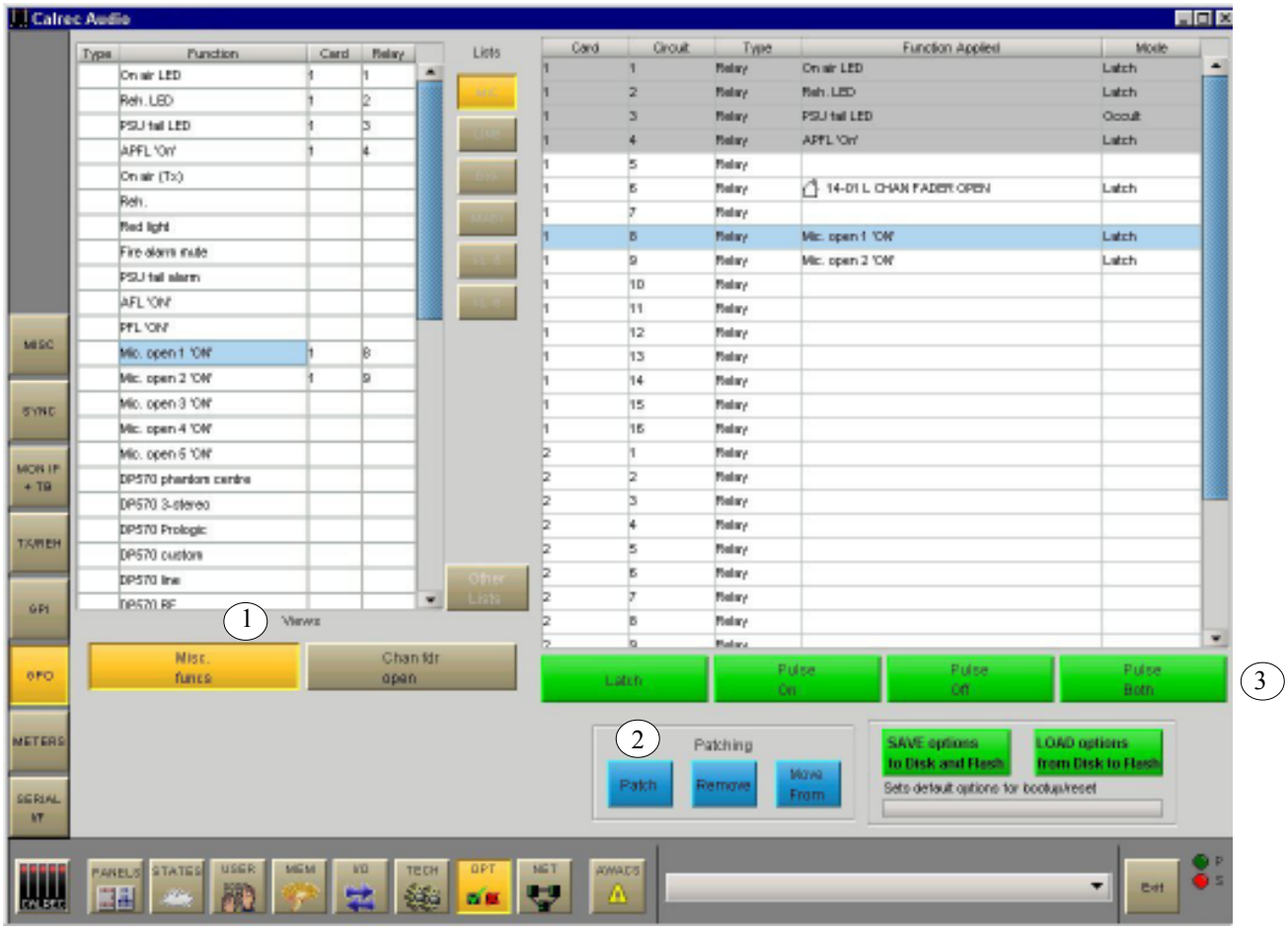


RTW 10810

Other Interfaces



GENERAL PURPOSE OUTPUTS



Up to 8 Relay isolated outputs are available on each GPI card in the system. Please note that on Relay/Opto card 1, relays 1 - 4 are not available, as they are used for TX, REH, PSU Fail and APFL facilities.

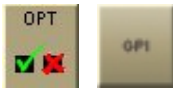
(1) "Misc Functions" or "Channel Fader Open"
The relay-isolated outputs can have various console functions assigned (with "Misc Functions" selected), or they can be set to operate when particular faders are opened (with "Channel Fader Open" selected). Console functions can be assigned to more than one relay.

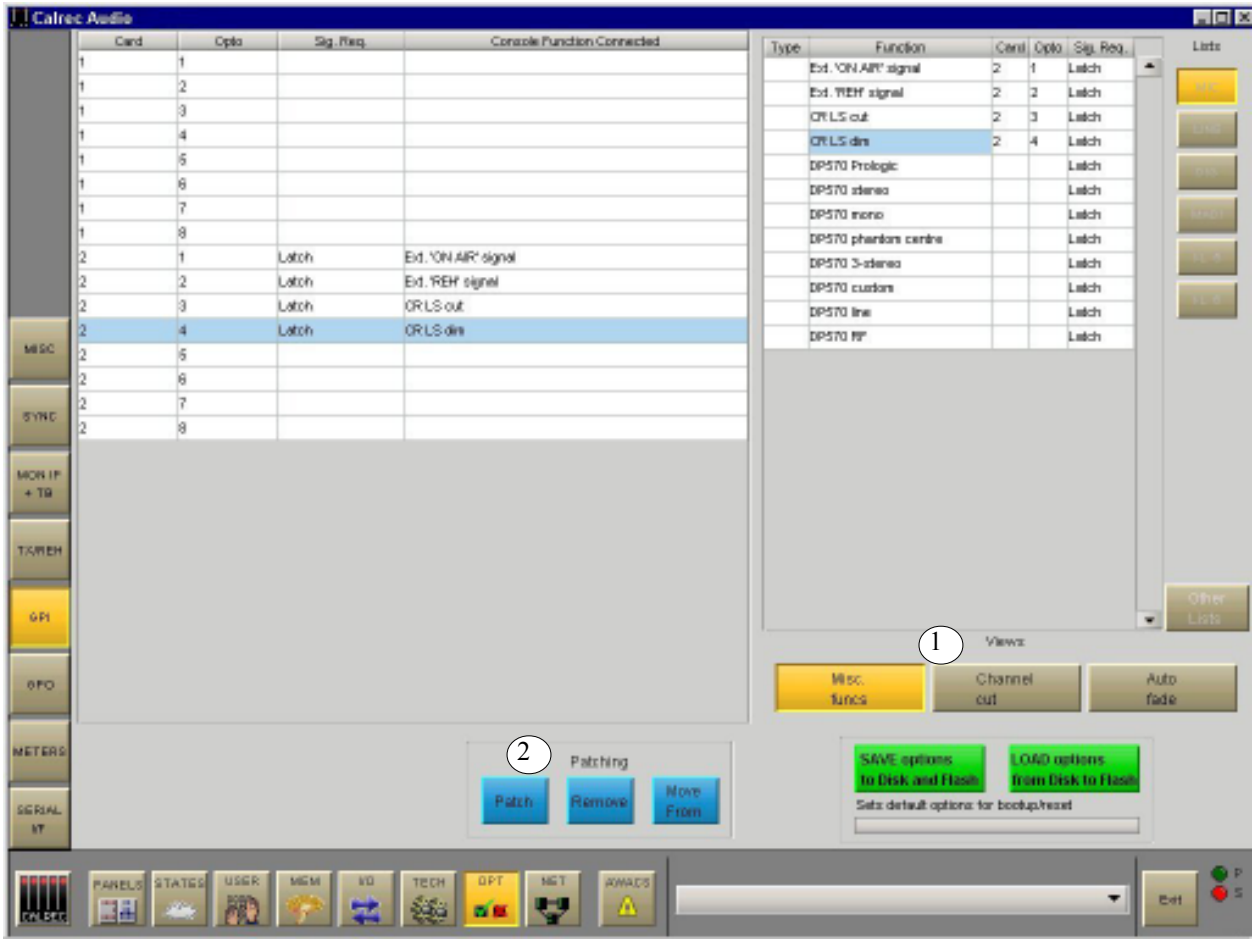
(2) GPO Patching
To make an assignment, select a function (left side of screen), and a relay-isolated output (right side of screen), and select Patch. Assignment can also be moved and removed, in a similar way to port connections.

(3) Latch or Pulse
The relay can be set to latch or pulse for 100 ms, when the console function is activated. When setting the relay to pulse, there are three different options.

Pulse On	The relay is set to pulse when the function is activated.
Pulse Off	The relay is set to pulse when the function is de-activated.
Pulse Both	The relay is set to pulse once when the function is activated, and again when the function is de-activated.

GENERAL PURPOSE INPUTS





Up to 8 Opto isolated inputs are available on each GPI card in the system.

(1) “Misc Functions”, “Channel Cut” or “Auto-Fade”
The opto-isolated inputs can be assigned to various console functions (with “Misc Functions” selected), or they can be set to cut channels (with ‘Channel Cut’ selected). With “Auto Fade” selected, the opto-isolated inputs can be assigned to auto-faders to allow automatic cross-fading.

(2) GPI Patching
To make an assignment, select an opto-isolated input (left side of screen), and a function or channel (right side of screen), and select Patch. Assignment can also be moved and removed, in a similar way to port connections.

If optos are patched to input ports, when fired externally, they will cut any channel to which that input port is connected.

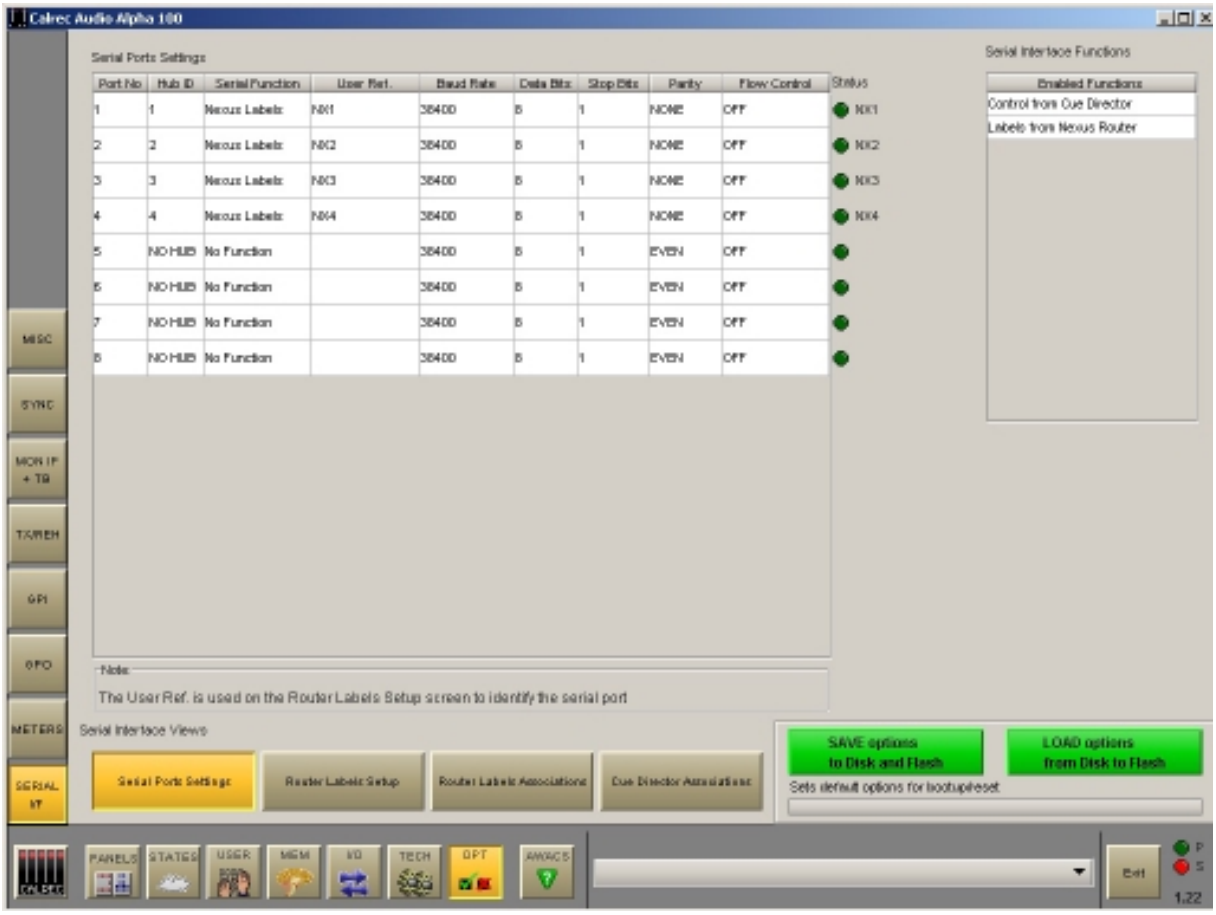
SERIAL INTERFACE

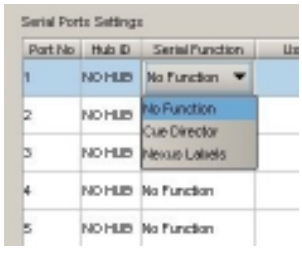
The system currently supports the following serial interfaces:

- Cue Director
- Nexus Router
- TSI Image Video 1000

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

Serial Port Settings Screen





The console can have up to 8 hub cards, each of which can have a serial interface port for allowing equipment to be connected to the system. The Serial Port Settings screen is used to tell the system what information it should receive from each serial interface port, by allocating a function to each from the Serial Function column. Only the serial functions which are enabled for the console will be available for selection.

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

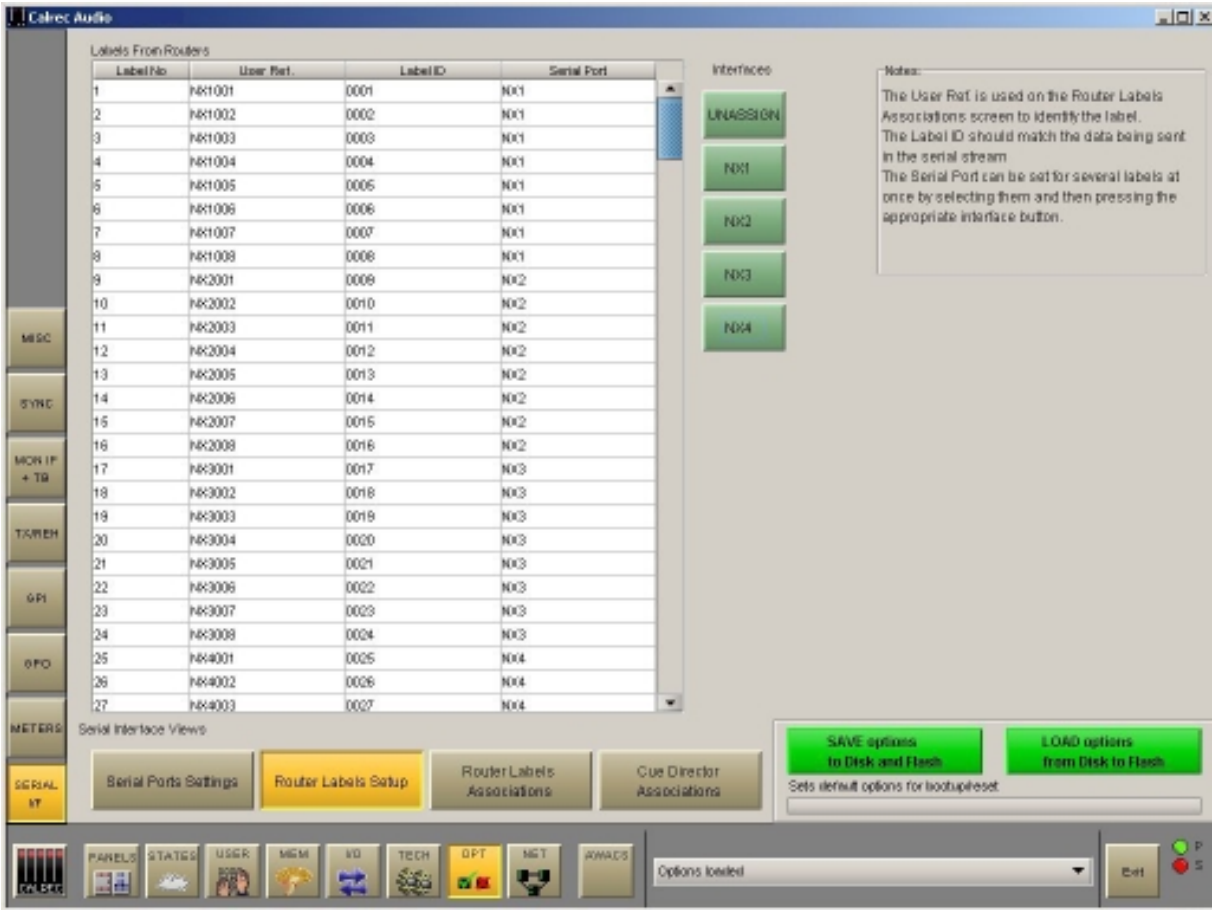
The function can be given a name by typing up to six characters in the USER REF column.

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

Router Label Setup Screen

Some Routers incorporate a label interface which is used for the transmission of source (input) and destination (output) descriptions between itself and other equipment. When an audio signal from a Router is connected to the console, its associated label is transmitted to the console via a serial interface. The console can use these labels as input names, and they can then be displayed and used on the control surface and front end application.

The console can support up to 256 Router labels. This screen allows the link between messages from the router to be associated with one of the console's 256 labels.

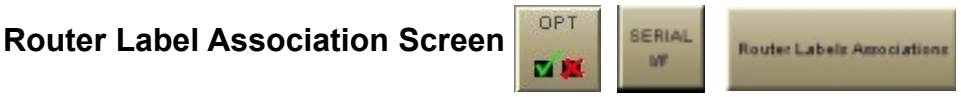


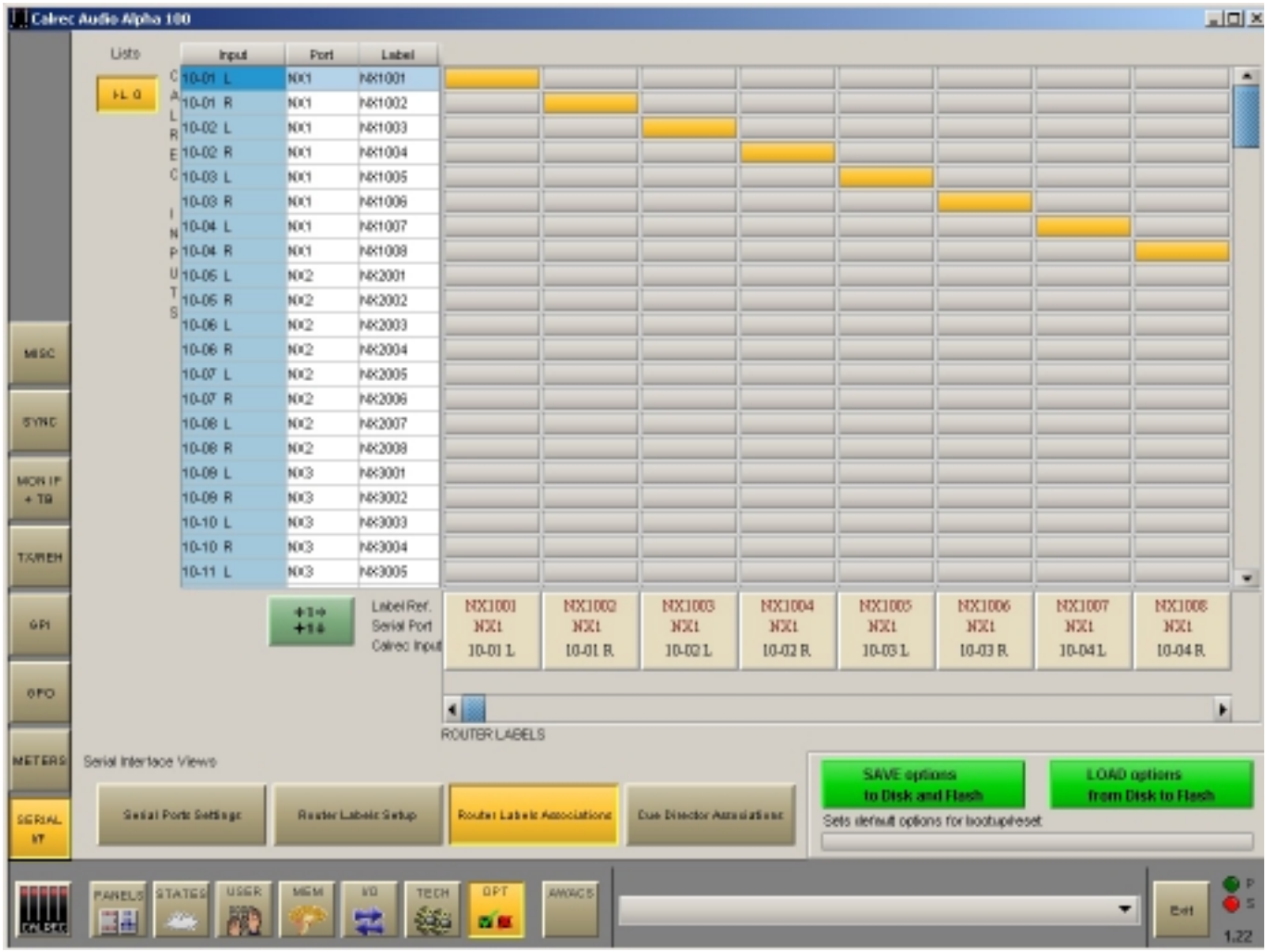
There are buttons next to the table, for each serial port function previously set up on the Serial Port Settings screen. To associate labels with a serial port interface, select the label, or region of labels, and select the required serial port function button. The serial port column tells the user which serial port function the label is linked to. The UNASSIGN button when selected will remove any assignment from the selected label(s).

A Router uses a reference code to define each of its output ports The user must enter these reference codes into the Label ID column for each label.

The User Reference column allows the user to give the label a friendly name of up to six characters.

Router Label Association Screen





This screen allows each of the defined labels to be associated with one of the console's input ports. The input ports are shown down the left hand side of the screen, and the Router labels are shown along the bottom of the screen. This forms a grid, and associations are made by selecting the intersecting cell between input port and router label. Each leg of the input ports is always presented as if it were a mono port.

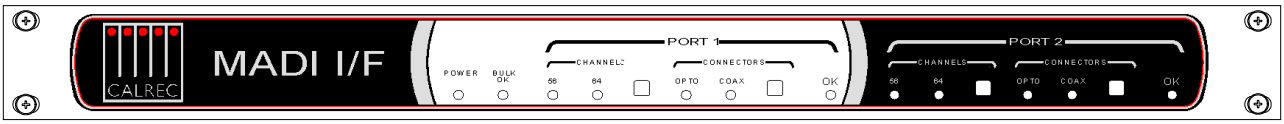
When an association is made, the cell will turn yellow. Associations can be unmade by selecting the cell again, whereby its colour will change back to grey. The +1 button is used to automatically move diagonally down the grid to the next association cell and toggle its condition. The action occurs out of sight even if you go beyond the viewed section of the screen.

Once an input port is associated with a Router label, the labels will be visible on the fader label column on the I/O - Input screen on whichever channel the port is patched. If a new fader label is entered on the I/O - Input screen, it overrides the router label. The router label will also be displayed on the channel display on the fader module.

If the Router fails to communicate for longer than ten seconds then the Router label text is cleared and the fader labels revert back to displaying the input port label.

OPTIONAL I/O EXPANSION VIA WIDE AREA INTERFACES

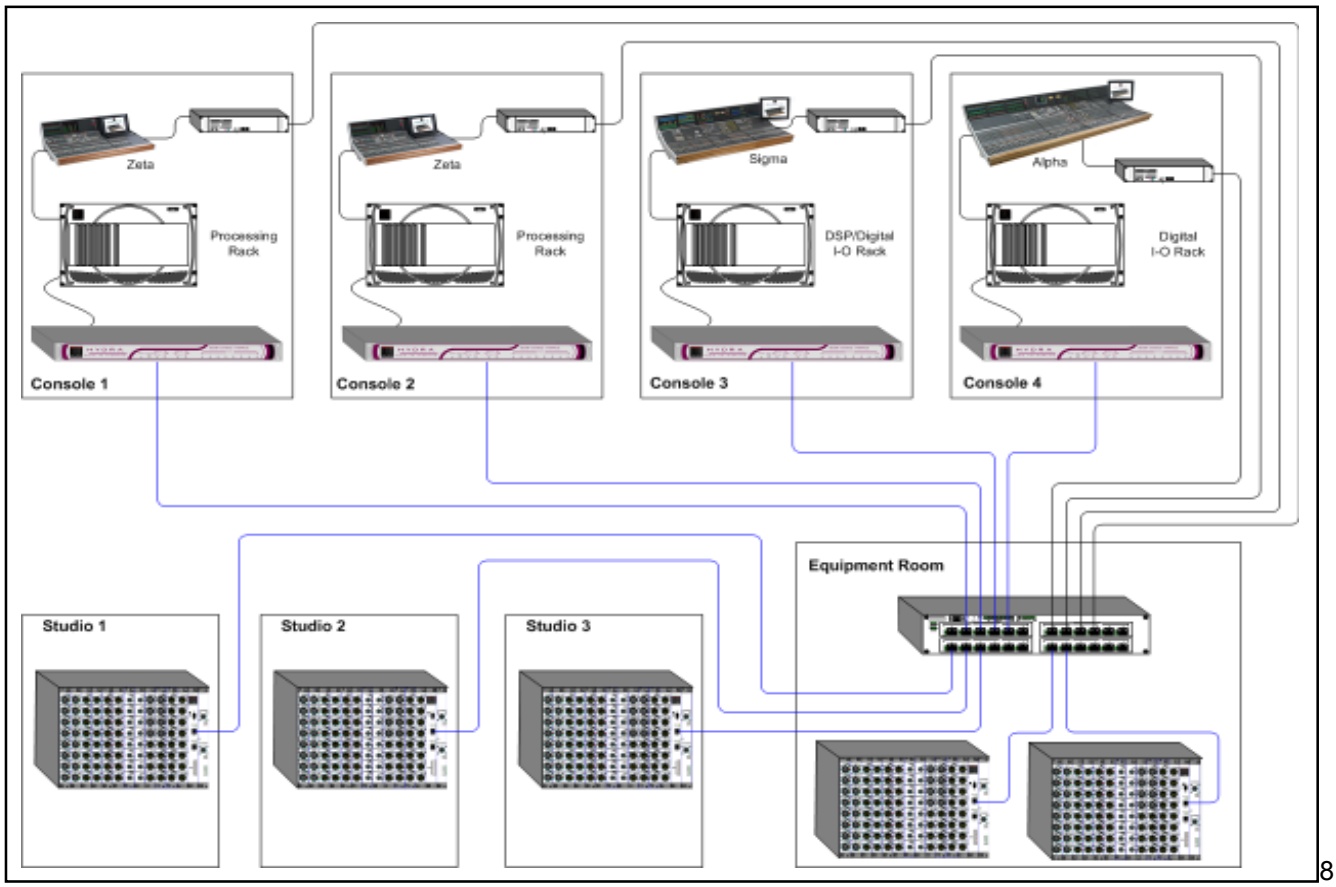
MADI



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 console via a Wide Area Bulk (WAB) card, which occupies one of the AES card slots in the DSP and 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

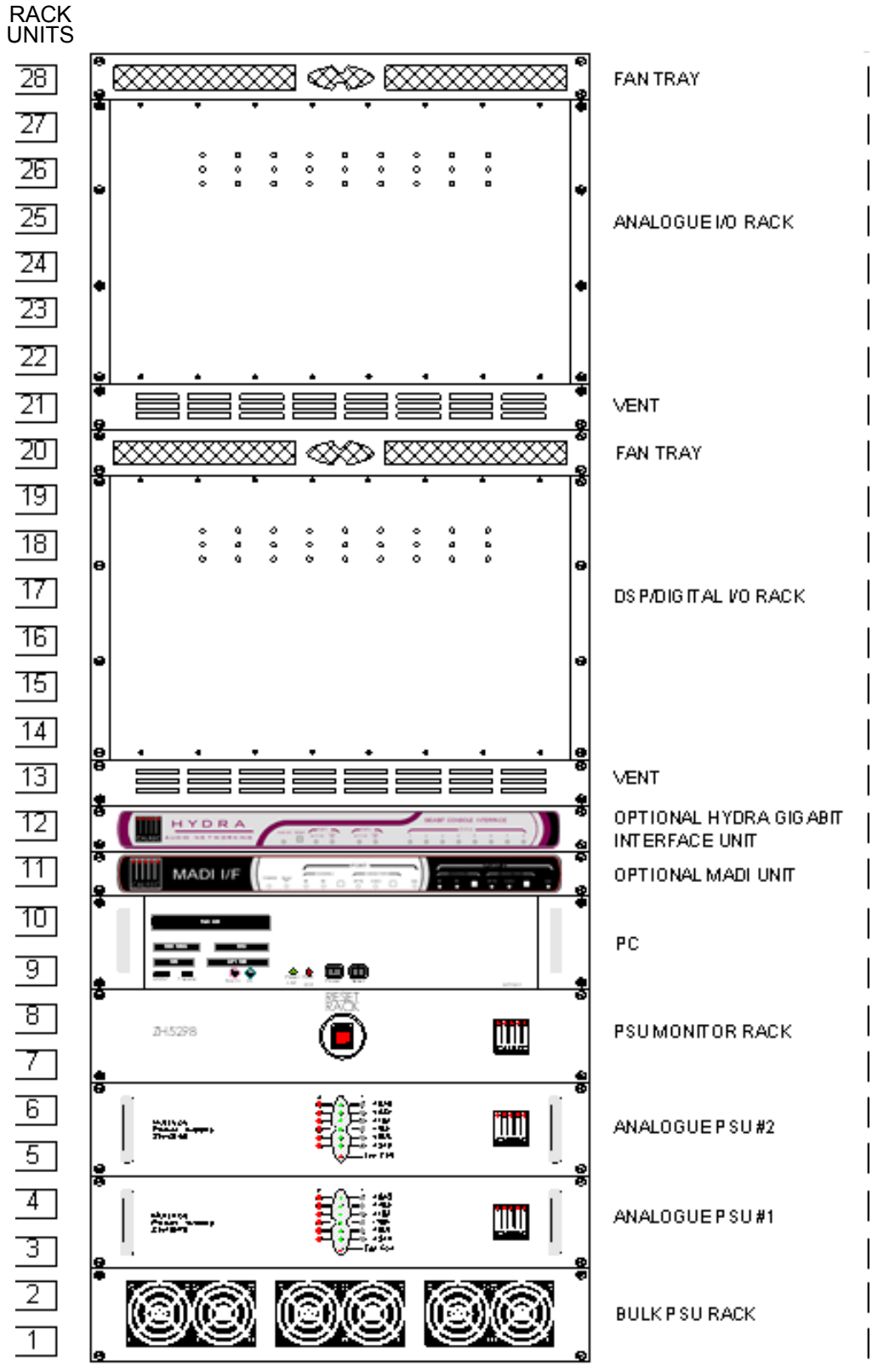
The Hydra Audio Networking System provides a powerful network for sharing of I/O resources and control data between Calrec digital consoles. Hydra I/O units, with up to 96 inputs/outputs, analogue or digital, may be connected onto the network, providing remotely located sources and destinations that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



Technical Information

TYPICAL RACK LAYOUT

It is recommended that all equipment over 8Kg (17.5lbs) in weight, or over 150mm (6 inches) deep, is mounted into equipment bays which offer mechanical supports under each of the units. The diagram below shows how the racks would typically be ladi out within the bay.



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

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

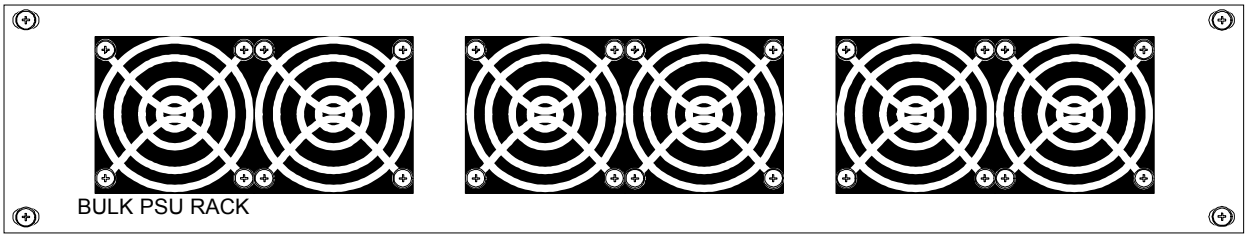
MAXIMUM CABLE LENGTHS

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	DSP/Digital I/O rack	16.5	5
Hydra Unit	DSP/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

Bulk Power Supply (Powers Control Surface and DSP/Digital I/O Rack)



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

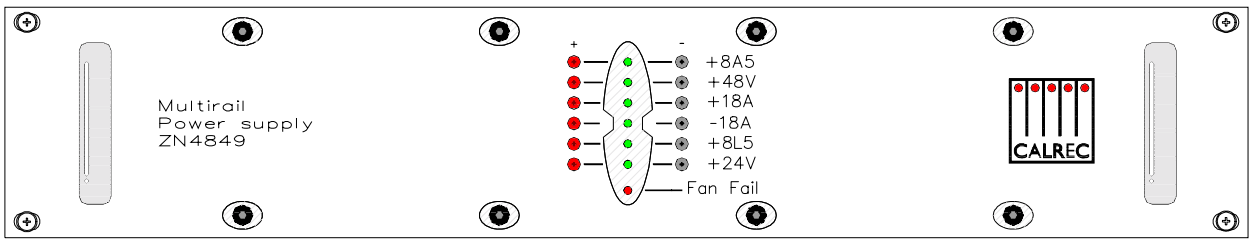
Each plug-in PSU has its own cooling fan, and the warm air is directed out of the rear of the rack. To ensure proper cooling, the power system requires a minimum clearance of two inches (50mm) from the fans and rear air outlets, and also any walls or other surfaces.

The following system fan noise measurements were taken on axis at 1 metre from the dominant noise source:

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

dB SPL A-Weighted

Multi-Rail PSU (Powers Analogue Racks)



The number of multi-rail PSUs required will depend on the type of installation. Generally, systems using one analogue I/O rack need one multi-rail PSU, and systems using two fully populated analogue I/O racks need two. An additional multi-rail PSU can serve as the hot spare for several analogue I/O racks, provided they are housed together. If housed in different locations, each analogue I/O rack may require a hot spare, although this is dependant on the cable lengths involved. Diode feeding allows supplies of the same type to be parallelled together. All hot spare PSUs are optional.

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

The Multi-Rail PSU is fan cooled using a very low noise fan, drawing air from side to side through the unit, instead of in from the front. This further minimises noise, measuring 29dBA, taken on axis at 1 metre from the dominant noise source. Should any of the fans slow down or stop, or any voltage rail fall outside specified limits, a PSU fail signal will be sent to the console via AWACS to warn the operator of a problem.

Power Monitoring and Distribution Unit

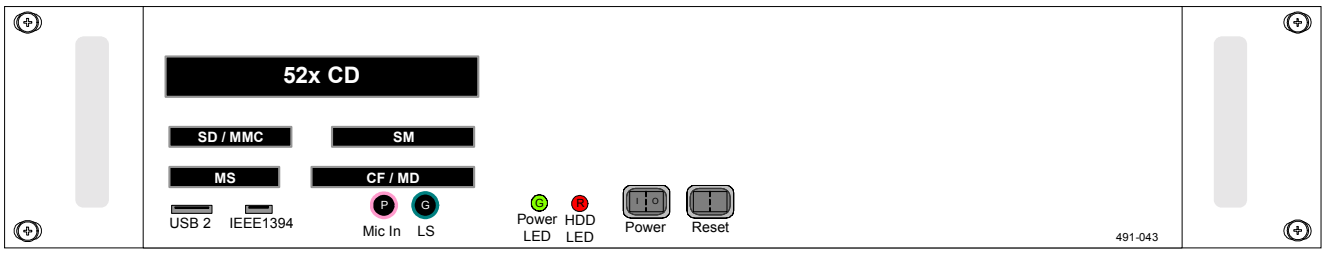
The Power Monitoring and Distribution rack-mounted unit monitors the power supplies for failures, and ensures "hot" changeover to the spare should a fault develop. The Reset button reboots the racks only, the control surface is unaffected.

PC INFORMATION

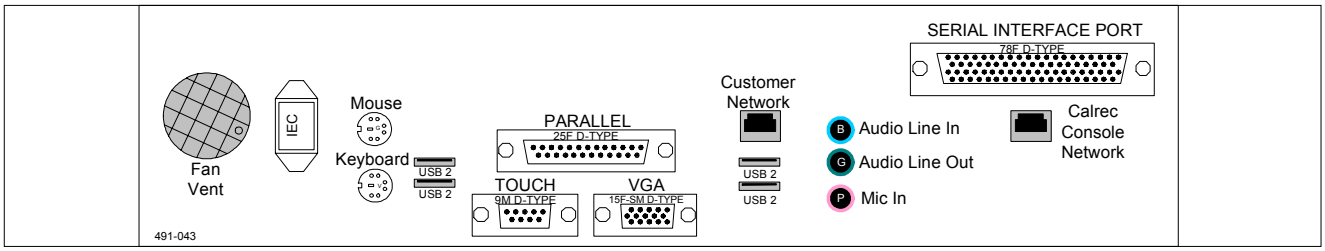
Failure of the console's PC does not prevent continued operation of the control surface or the audio.

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	8 Port Serial Card
Additional Software	PC Anywhere

Front



Rear



Remote Access

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

Network Ports

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

Software Supplied

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

3rd Party Software

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

INTERFACE CONNECTOR PANELS

AES Interface Connector Panels

AES inputs and outputs may be connected directly to the Alpha 100's Digital I/O rack using 36 way SCSI mating connectors. Optionally, break out connector panels and cabling can be provided. Ideally, interface panels should be fitted within 3m (9.8ft) of the backplane they connect to.

For digital inputs and outputs, interface panels can be either XLR (16 male or female, on a 1U panel) or BNC (32 on a 1U panel).

Analogue Interface Connector Panels

Analogue inputs and outputs may be connected directly to the Alpha 100's Analogue I/O rack using 36 way SCSI mating connectors. Optionally, break out connector panels and cabling can be provided. Ideally, interface panels should be fitted within 3m (9.8ft) of the backplane they connect to.

For analogue I/O, 8 x 38 way or 12 x 38 way EDAC connector 2U panels are available in the following styles:

- Mic/Line Inputs - 4 pairs per EDAC
- Line Only Inputs - 8 pairs per EDAC
- Line Outputs - 8 pairs per EDAC

SYSTEM SPECIFICATION

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

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

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

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

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

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

(926-074 Iss.13)