SIGMA
SYSTEM PLUS

OPERATOR'S MANUAL (Product V1.25)
ISSUE 5

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

This publication is for International usage.

Please also refer to the User Registration page at the end of this manual.

Please observe the following:-

After Sales Modifications
Modifications to this equipment by any party other than Calrec Audio Limited may invalidate EMC and safety features designed into this equipment. Calrec Audio Limited can not be liable for any legal proceedings or problems that may arise relating to such modifications.

If in doubt, please contact Calrec Audio Limited for guidance prior to commencing any such work.

ESD (Static) Handling Procedures
In its completed form, this equipment has been designed to have a high level of immunity to static discharges. However, when handling individual boards and modules, many highly static sensitive parts are exposed. In order to protect these devices from damage and to protect your warranty, please observe static handling procedures, for example, use an appropriately grounded anti-static wrist band. Calrec will supply an electrostatic cord and wrist strap with all of it's digital products.

All modules and cards should be returned to Calrec Audio Limited in anti-static wrapping. Calrec Audio Limited can supply these items upon request, should you require assistance.

This applies particularly to digital products due to the types of devices and very small geometries used in their fabrication, analogue parts can however still be affected.

IMPORTANT HEALTH AND SAFETY INFORMATION

- This equipment must be EARTHED.
- Only suitably trained personnel should service this equipment.
- Please read and take note of all warning and informative labels.
- Before starting any servicing operation, this equipment must be isolated from the AC supply (mains).
- Fuses should only be replaced with ones of the same type and rating as that indicated.
- Operate only in a clean, dry and pollutant-free environment.
- Do not operate in an explosive atmosphere.
- Do not allow any liquid or solid objects to enter the equipment. Should this accidentally occur then immediately switch off the unit and contact your service agent.
- Do not allow ventilation slots to be blocked.
- Do not leave the equipment powered up with the dust cover fitted.
- The rack mounting parts of this equipment must be fitted into an enclosure which complies with local regulations.

Cleaning

For cleaning the front panels of the equipment we recommend anti-static screen cleaner sprayed onto a soft cloth to dampen it only.

Explanation of Warning Symbols

The triangular warning symbols below contain a black symbol on a yellow background, surrounded by a black border.

The lightning flash with arrow head symbol within an equilateral triangle is intended to alert the user to the presence of dangerous voltages and energy levels within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock or injury.

The exclamation mark within an equilateral triangle is intended to prompt the user to refer to important operating or maintenance (servicing) instructions in the documentation supplied with the product.

Power Supply Blanking Plates (ZN4849-3 and ZN6020)

If you are in receipt of a ZN4849-3 or ZN6020 power supply unit please do not remove the blanking plates which are fitted to the unused output connectors. The maximum potential between the terminals exceeds 60 volts, the blanking plates are fitted to avoid the risk of electric shock.

CONTENTS

TECHNICAL CUSTOMER SUPPORT

should you require any technical assistance with your Calrec product then please contact your local distributor, if outside the U.K. and Ireland. For a list of Worldwide distributors please see the Calrec Web site at www.calrec.com or contact Calrec UK.

For technical assistance within the UK and Ireland, please contact the Customer Support Team at :-

Customer Support
Calrec Audio Ltd
Nutclough Mill
Hebden Bridge
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England
UK

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

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

- Arrange repairs
- Supply of replacement or loan units while repairs are being carried out
- Service / commissioning site visits
- Operational training courses
- Maintenance training courses
- Supply of replacement components
- Supply of documentation
- Technical advice by telephone

Customer Support Hours
Factory based customer support engineers can be contacted by telephone during normal office hours, or outside hours, a message can be left on the answering machine. All messages are dealt with promptly on the next working day. Alternatively a message can be sent to them by email.

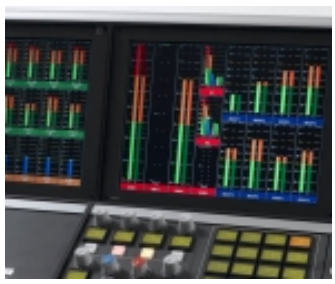
Product Warranty
A full list of our conditions & warranties relating to Goods & Services is contained in the Company's standard Terms and Conditions. A copy of this is available on request.

Repairs
If you need to return goods to Calrec, for whatever reason, please contact the Company beforehand in order that you can receive advice on the best method of returning the goods, and that a repair order reference number can be issued.

Standard of Service
Ensuring high standards is a priority, if you have any comments on the level of service, product quality or documentation offered to you by Calrec, then the Customer Support team would be pleased to receive your comments through any of the normal contact numbers, email or on the User registration form located at the end of this manual. If you have any other issues regarding your Calrec purchase, then please contact us and we will do our best to help. Calrec welcomes all Customer feedback.

Overview






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 optional control panel.
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.

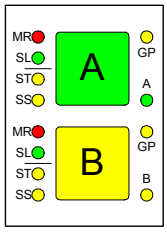
IMPORTANT CONCEPTS

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.

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 and S2 for the main and sub-main output paths on the main faders. Pressing the Assign button causes the central control panels (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.

Port Labels

During installation, all the ports on the system are labelled to match the studio wiring. Some rules are imposed on this labelling:

- Inputs and outputs should be labelled in pairs.
- The label must be no more than six characters (to fit on the console’s displays).
- The same label cannot be used more than once (but an input can have the same label as an output) - to avoid confusion.

Inputs and outputs are labelled in pairs for easier use with any type of signal; mono, stereo or surround. As digital inputs and outputs are wired in pairs and it makes sense to deal with all the inputs and outputs in the same way.

The system automatically adds a left (L) and right (R) suffix to the label to distinguish the two halves of the pair, or an LR suffix when the pair is used together.

The pairs can be used either for two mono signals, or a stereo signal, or parts of a surround signal. This includes the digital ports if the external circuit allows them to be used for two mono signals.

Those inputs or outputs which are dedicated externally to mono signals only (telephone lines, mono reverbs, mono distribution feeds, etc), can be specified as being mono. In this case, the two halves of the pair have separate labels and the L & R suffixes are not applied. Inputs and outputs labelled in this way cannot be connected in pairs to stereo paths.

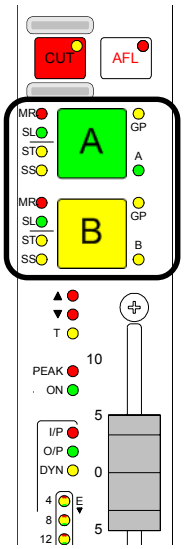
Port Lists

In addition to labelling, each port may be allocated to one of a number of lists during the Set up Application. This allows inputs and outputs which are wired for similar purposes to be grouped together for selection. There can be up to 12 lists for input ports, and up to 8 lists for output ports. Each list can contain a mixture of normal inputs or outputs (labelled in pairs) and inputs or outputs dedicated to mono signals. Each list is given a six character label, and automatically sorted alphabetically/numerically.

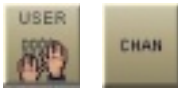
The lists can be sorted into the order in which they appear on the selection screens. The lists will appear in the same order on the optional I/O Matrix panel (if fitted) and I/O screens. It is possible to restrict the lists which appear on the I/O Matrix panel using the Options - Misc screen. This reduces the number of times the pot needs to be pushed, to go through all the available lists. All lists are always available on the I/O screens.

GETTING STARTED

As a safety measure, ensure that all faders are minimised, and the control room level control is no more than half way up.

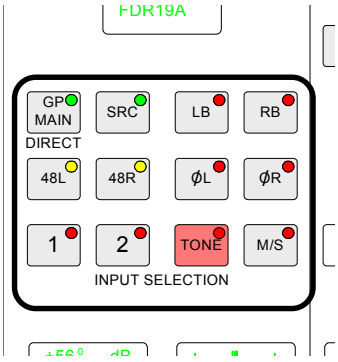


Assuming that the basic system ports have been set up and the control room monitor speakers are connected to the appropriate outputs, firstly choose a channel fader by pressing the A (or B) button on the channel fader module.



Next, go to the **USER-CHAN** Screen by selecting USER and then CHAN on the touch screen. If a Path Type is not already indicated, press either the mono or stereo buttons to assign a mono or stereo channel to the fader, or select one of the group buttons 1-8 to assign a group to the fader. An optional I/O Matrix panel may be fitted so that these functions can be performed on the control surface.

Next, go to the Input Output panel and select Input 1.



Go to the **Input Ports Screen** by clicking **I-O** and then **INPUT**. 

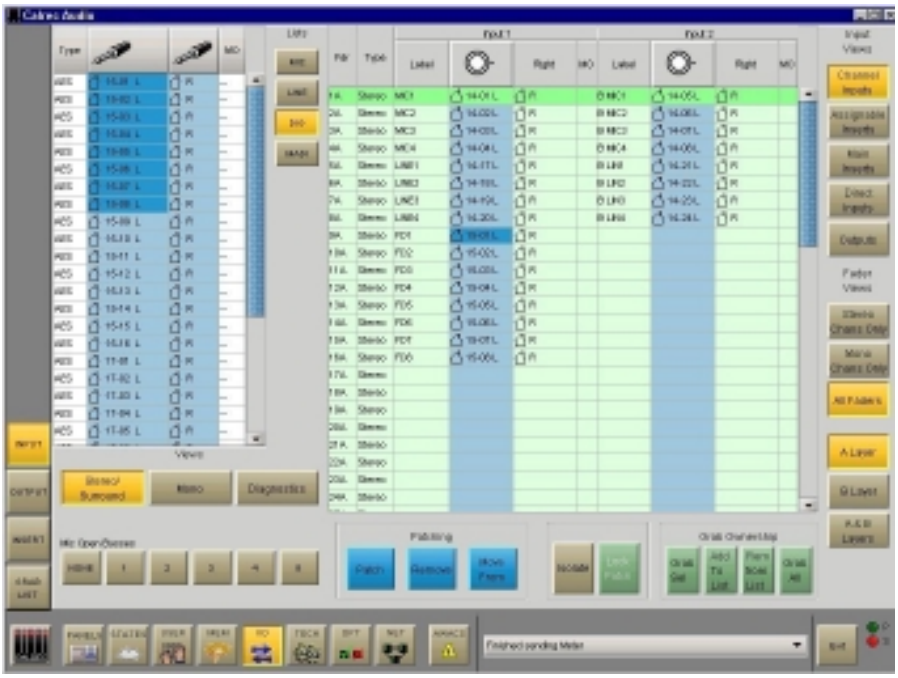
Connections are made by selecting:

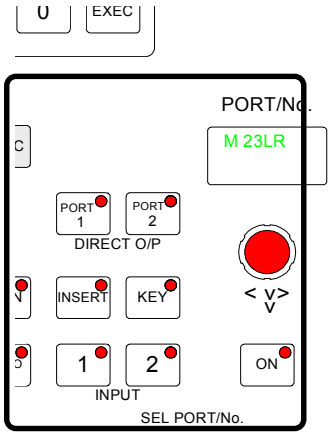
- An input source  and...
- A channel input 

...and selecting PATCH. 

The input source label will appear in the Channel input NAME field and on the fader display on the console.

By clicking on one of the Name cells, the input name can be edited. The PC keyboard slides out from the front of the console.



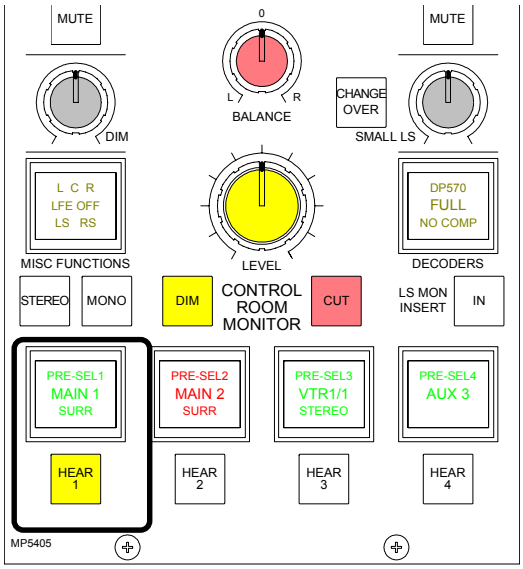


Connections can also be made using the optional I/O Matrix panel. Select Input 1 in order to assign a port to it. Do this by turning the selector control knob to scroll through the available ports. Pressing the knob down and turning it will switch to another list of input ports. Once you have arrived at the port you want, press the ON button to connect it. (This is like inserting the patch cord).

You are now ready to use the channel as you would on any other desk. Set the input gain and panning etc, on the Input/Output panel, the EQ and Dynamics on their panel, and route the signal to Main 1, using the routing controls.

Now fade up the Main 1 fader and select Main 1 SURR as a Control Room Pre-Select (Monitor LS panel), and press HEAR. If the channel fader and LS volume controls are set correctly you should hear the signal.

Refer to the descriptions of the individual control panels and screens for a more detailed description.



TOUCH SCREEN USAGE AND 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 sub-sets of the screen's function.

Operational reproductions of the input delay panels.

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 studio's 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 over-written 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.

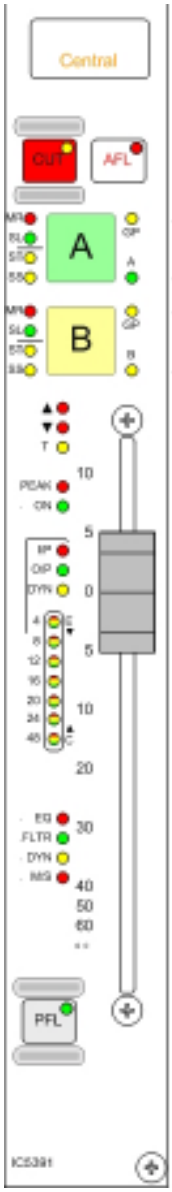
Screens for setup and control of an audio network system (Only visible if the Hydra audio networking system is installed).

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).

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.

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 change to match the settings of each path.

The display shows the label associated with the input assigned to the path, or the group number if the path is a group. The input labels default to the Port ID but can be changed to a more suitable label using the I/O screens. Path A's label is shown in the top half of the display, and path B's label is shown in the bottom half of the display. The colour of the display indicates the active path. If path A is active, the label will be green. If path B is active, the label will be amber.

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.

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.

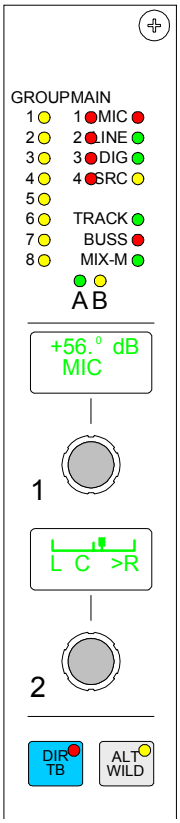
The PEAK LED will light if the channel or group signal is within 3 dB of the clipping level. The ON LED lights when the audio level is not at the ∞ position.

The fader bargraph indicates the level at the channel input (post the input gain, input 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 (EQ, Filters and Dynamics settings may be flat - LEDs indicate that the function is switched IN).

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 on the States screen), 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.

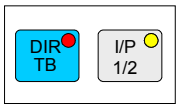
Wild Control Push-Switch Option

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.

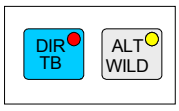
Talkback is available to direct outputs using the DIR TB button. All Talkback buttons are subject to On-Air inhibits, set up on the Options - TX/REH screen.

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.

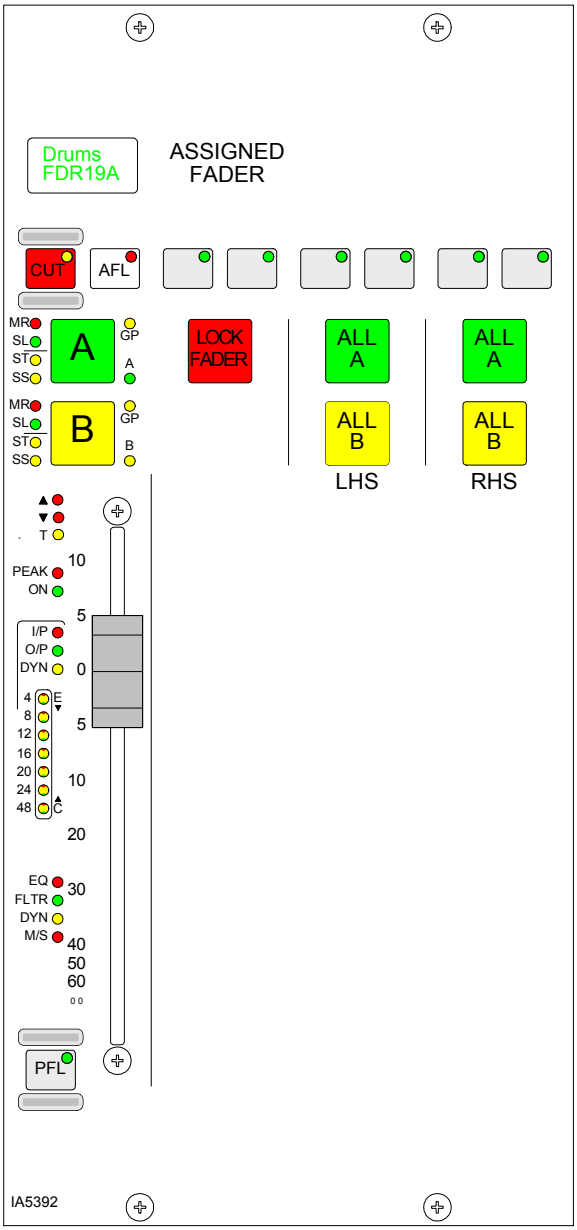


Option 2
The ALT WILD button allows switching between two complete sets of alternate wild settings. This would then allow up to 4 available wild controls per fader.

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.

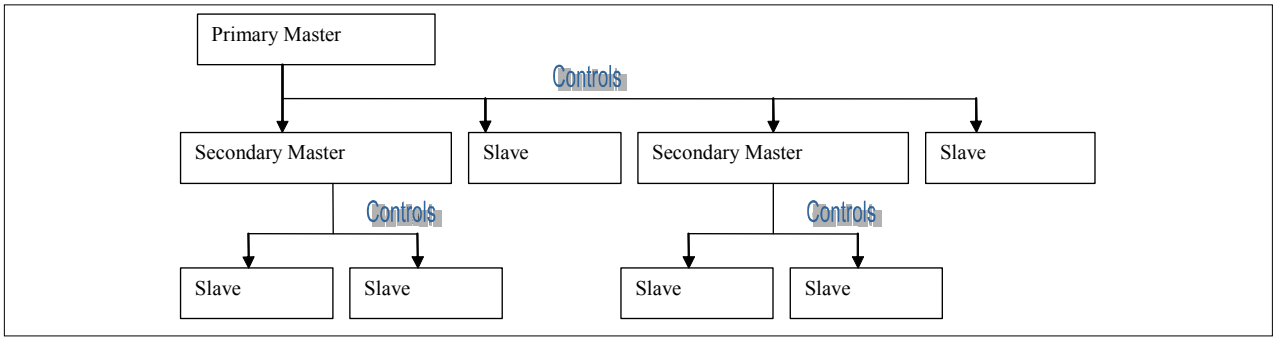


VCA GROUPING

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 its 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.

A slave can be made into a secondary master by adding slaves to it. 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.. Interrogation of a Primary Master will light the Assign buttons of its primary slaves and secondary masters. Interrogation of a secondary master will light the Assign buttons of its secondary slaves, 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.

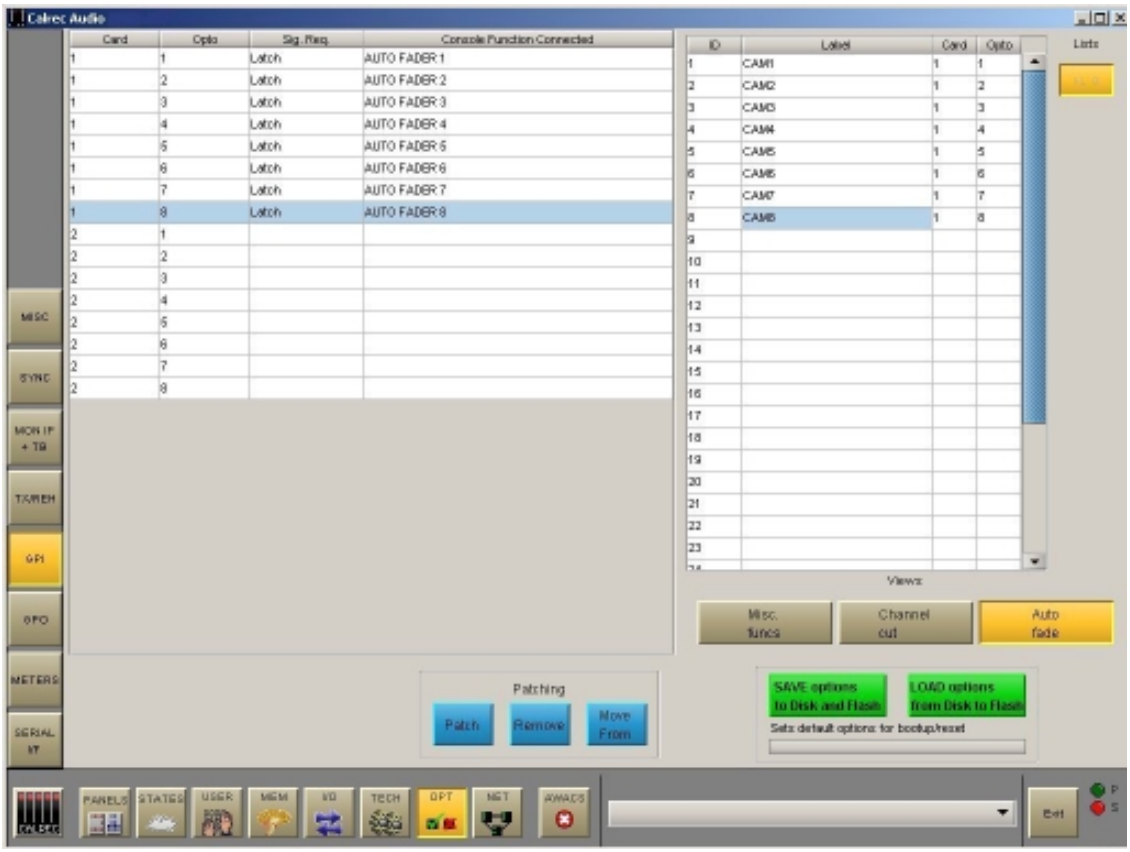
AUTOMATIC CROSS-FADING

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.

Assignable Auto-Faders

32 assignable auto-faders are available. Each auto-fader provides the ability for one path to be faded up to and down from the current fader level.

Assigning Auto-Faders to Opto Inputs

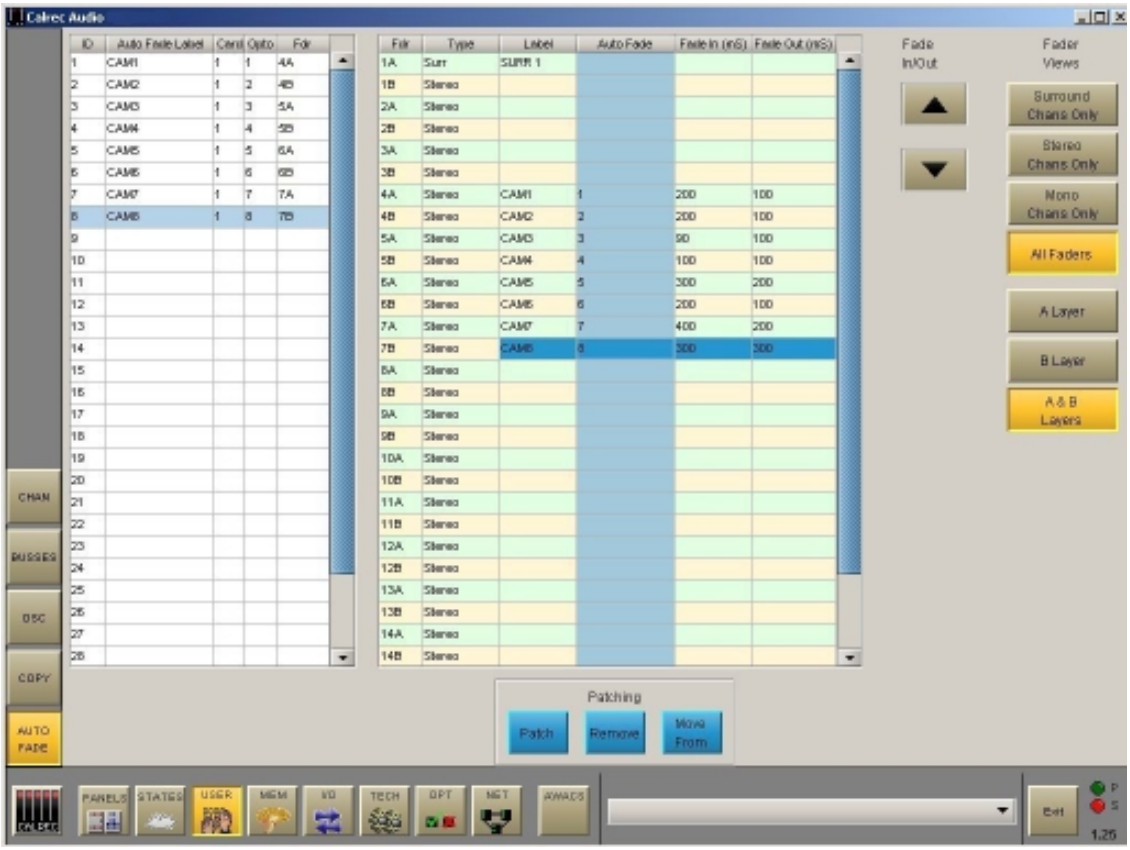


Each auto-fader can be assigned to any one opto input using the Options-GPI screen. Select an Opto from the available list on the left, and an auto-fader from the auto-fader list on the right, and then select "Patch". Each autofader has a 6 character user editable label.

Auto-Fade Screen

The User-Auto Fade screen is used to allow assignment of each auto-fader to a channel or group fader. A list of auto-faders is on the left hand side of the screen, and shows auto-fader number, auto-fader label, assigned Opto card and circuit, and assigned fader number. Only faders with valid channel or group paths will be available for assignment although other faders may be displayed.

Auto-faders are assigned to channel and group paths by selecting an auto-fader and a channel or group from the available lists, and selecting "Patch".



Fade In/Out Times

The fade in and out times of each auto-fader are individually adjustable either by typing a value in the relevant cell in the fade in/out columns, or by using the nudge buttons. 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

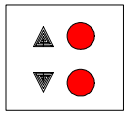
Operation

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 assigned channel or group fader under the control of the assigned 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.

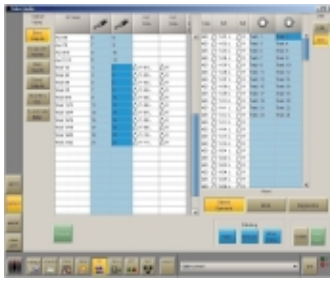
An auto-fader without an assigned opto will remain inactive, its operation will have no effect on the audio but it may still be assigned to a path.

Indication of an Auto-Fade

Indication of an auto-fade is provided by illuminating the down NULL LED on the fader strip when the fader 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.

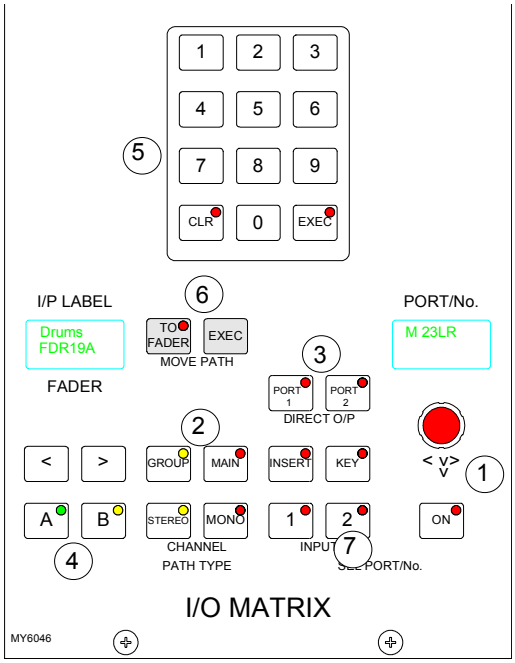


Input and Output Controls




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. (Note: This does not switch the channel from input 1 to 2, or 2 to 1 - this is done using the Input/Output panel).
- 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.

Lists

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

(2)Path Type Selection

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

(3) 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.

(4) 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.

(5) 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.

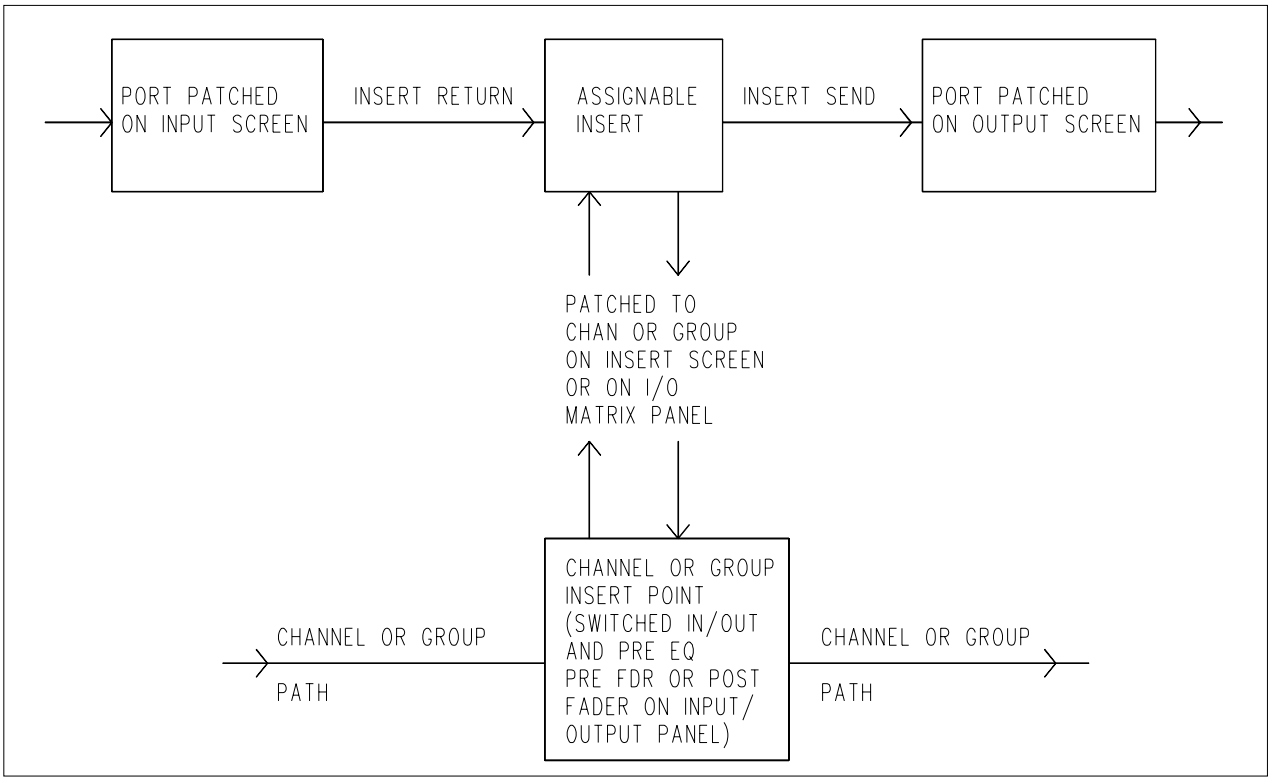
(6) Moving Paths
Paths can be moved or swapped from one fader to another, using the MOVE PATH buttons. To move paths, select the assign button of the path you wish to move, and press TO FADER (the assign button will flash). Then select the assign button of the destination fader, and press EXEC to move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

(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.

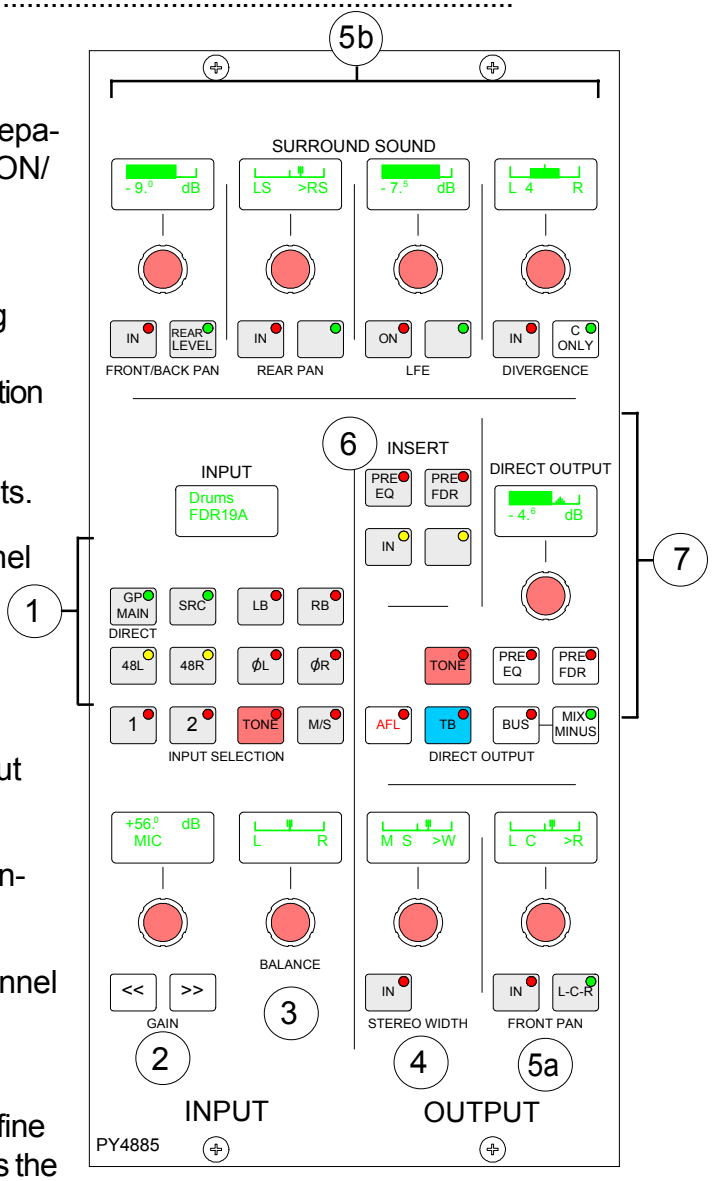
Assignable inserts are designed to be pre-connected to send and return ports which are in turn pre-wired to insertable devices or to an insert patchbay (normally there would be some assignable inserts of each type). The Input and Output screens allow send and return ports to be set up for the assignable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

To facilitate the assignment of these inserts, the system allows the user to label them, in a similar way to how the Ports are labelled. The same rules also apply, including the exception that inserts dedicated to mono devices can be marked as such.The assignable inserts can be divided into up to 4 lists 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 dedicated selection buttons for inputs 1 and 2 in its channel control section above the fader.

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.

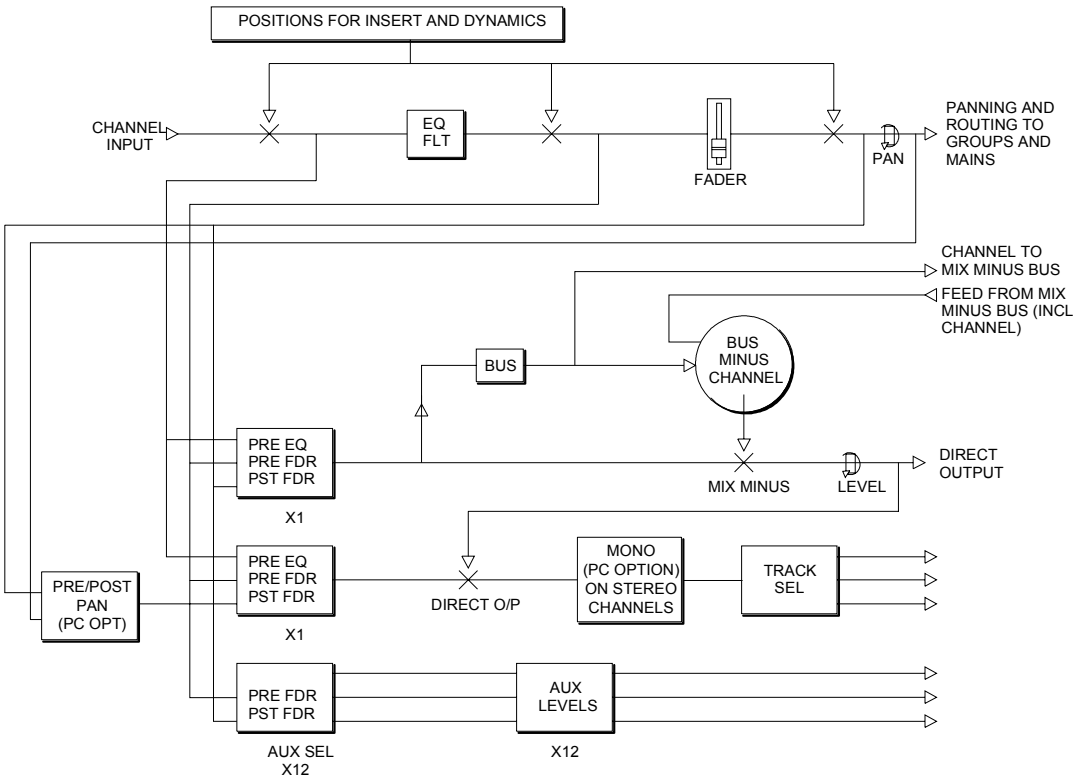
The divergence controls set an amount of the centre signal to also feed to the left and right. Divergence does not operate on stereo channels and groups. The C ONLY button connects the channel output to the centre bus only. All other panning controls are disabled. The channel is fed to both left and 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).

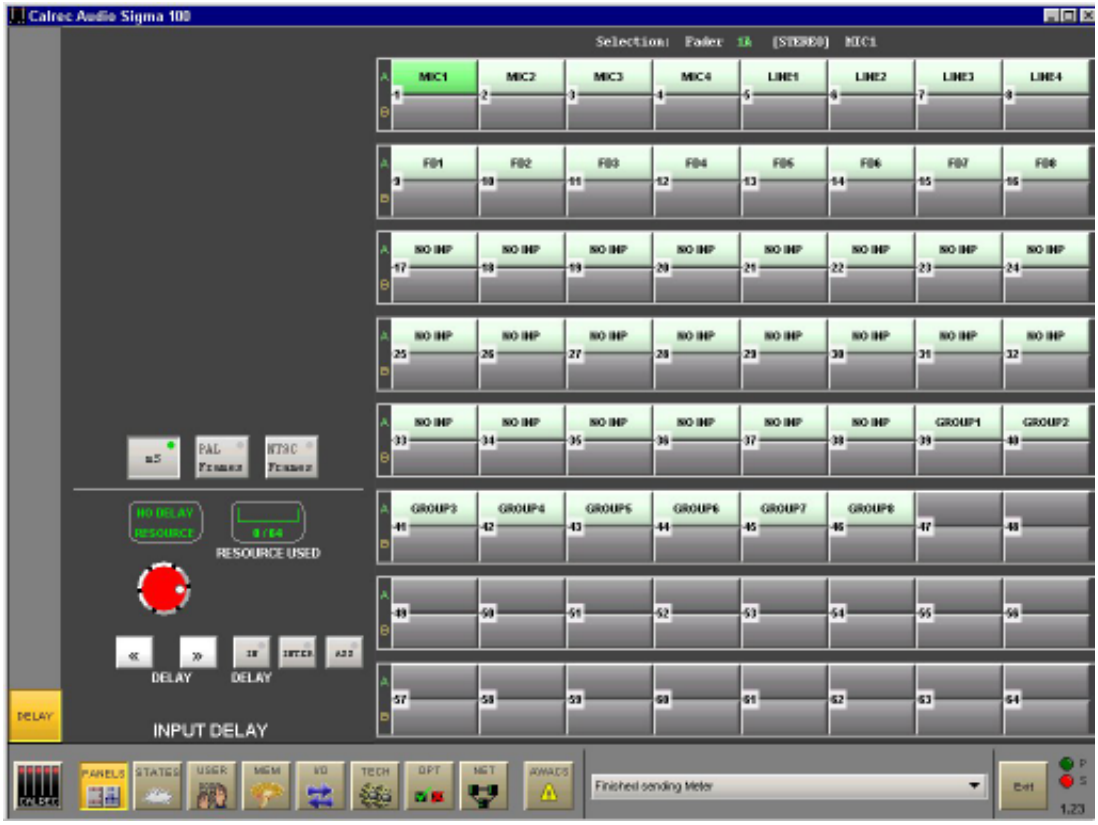
(7) Direct Output and Mix Minus

The channel or group's direct output can be Pre-EQ or Pre-fader using the selection buttons (It is post-fader with none selected), and its level is adjusted using the rotary control. BUS feeds the direct output signal to the mix minus bus. The output of the mix minus bus feeds back into the channel or group, where its own signal is subtracted. MIX MINUS then feeds the resulting signal to the direct output. Therefore, every channel and group can produce a mix minus output which is a mix of all the signals 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.



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

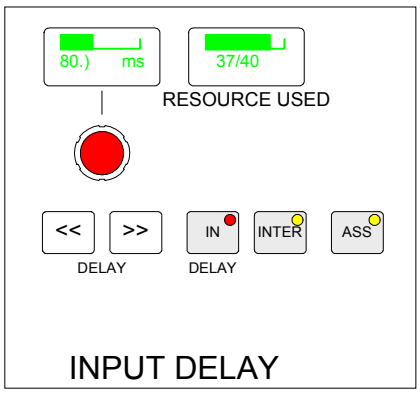
Select the fader path either by pressing its assign button or by selecting it from the screen, then select ASS. The delay value is adjustable in 0.1ms steps using the rotary control, and 10ms steps using the nudge buttons. The RESOURCE USED display shows the number of legs assigned. If an attempt is made to assign more than the available delay resources a popup message will be reported. 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.

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

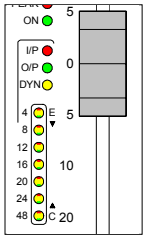
The path type can be selected either as a mono or stereo channel using the mono and stereo buttons, or as a group, using the numbered buttons. Path type selection can also be done using the optional I/O Matrix panel (if fitted). Groups are designated as mono or stereo using the Busses screen.

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. The two Wild controls “FLIP” with the fader, providing the same function for each of the two paths.

If the fader is touched instead of pushing a rotary control, then the fader for the alternate layer will be assigned to the Wild 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.

Please note that Auxiliary output controls cannot be assigned to Wild controls.

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 Wild 1 or 2 on the screen and HOLD (both will light). Any number of fader paths can then be selected individually by pressing their fader assign buttons (A or B) which will illuminate. Pushing an Assign Panel rotary control will then assign that control to Wild 1 or 2 for all selected fader paths.

In REGIONS mode, select Wild 1 or 2 on the screen and HOLD (both will light). A block or region of faders can then be defined by pressing the fader assign buttons of the first and last fader path in the required region. Pushing an Assign Panel rotary control will then assign that control to Wild 1 or 2 for all fader paths in the selected region.

CLR can be used to clear regions of faders of their wild control assignments.

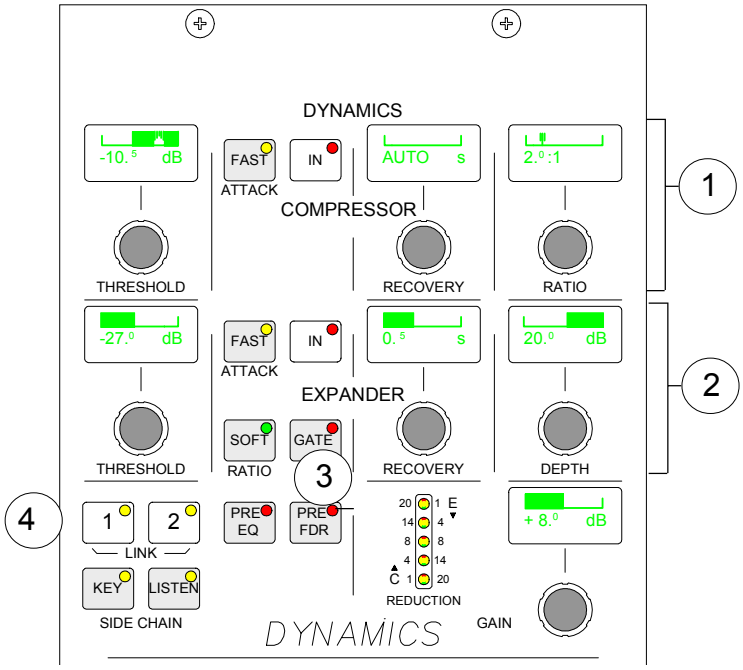
It is possible to assign the same control to Wilds 1and 2 for all fader paths by selecting ALL before pushing the required Assign panel rotary control.

If the Track output level control is assigned to a block of wild controls, each fader’s wild control will have a different numbered track output level control, beginning with the track currently selected on the first fader in the block.

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.

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. Once a channel has been selected by pressing it's Assign button (A or B), it'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

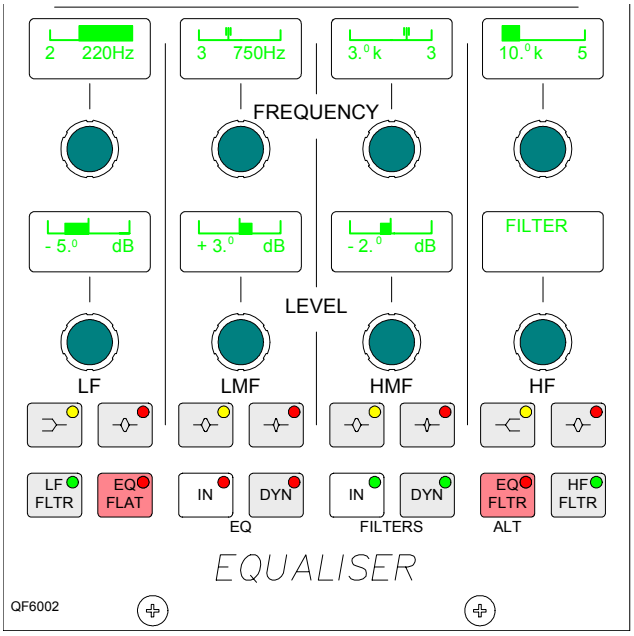
Threshold 0dB to -40dB
Recovery 75ms to 4 sec + AUTO
Depth 0dB to 40dB
Fast attack 300µs (normal 16ms)

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.

EQ AND FILTERS



The Equaliser section of the module controls EQ and Filters on the channels. As console processing is not pooled, EQ can be assigned to every channel, without fear of running out.

Once a channel has been selected by pressing it's Assign button (A or B), it'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.

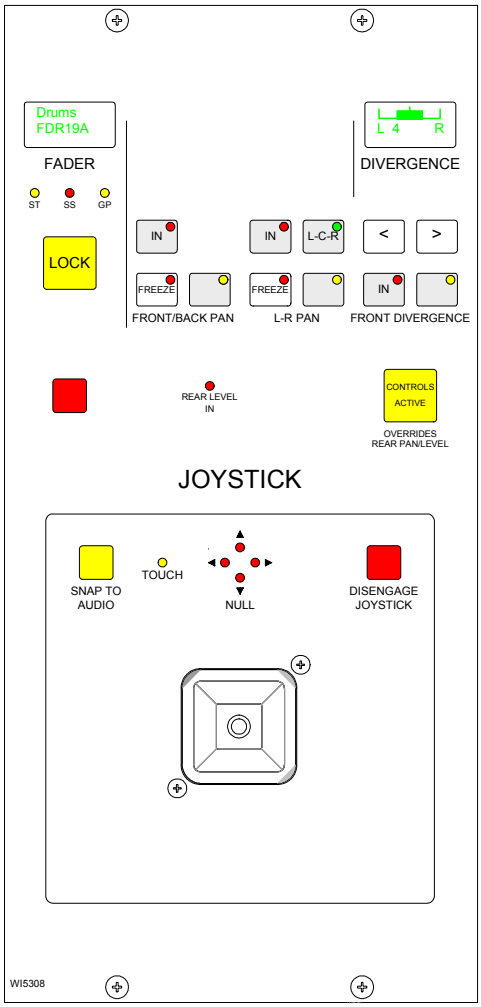
Alternate EQ

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.

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

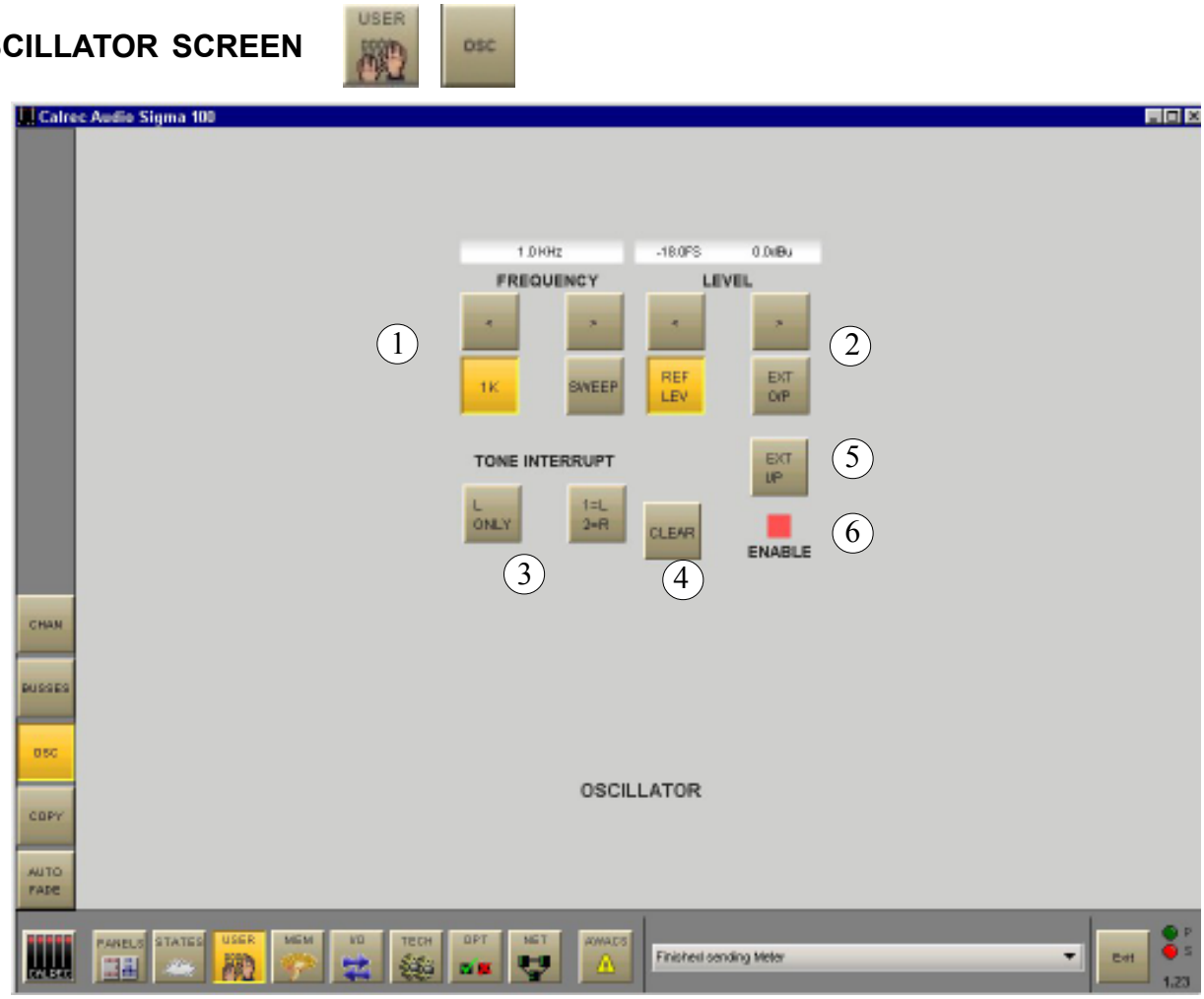
Nine sections of the currently assigned channel or ALL together can be copied to another channel or channels using this screen.

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 selections 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.

OSCILLATOR SCREEN



This screen provides controls for the oscillator.

(1) Frequency
The frequency of the tone can be adjusted from 20Hz to 20KHz in in incremental steps using the nudge buttons, or set to 1KHz using the 1K button. Alternatively, the sweep button will set the oscillator to sweep through all frequencies.

(2) Level
The level of the test tone can be adjusted from -60dBFS to 0dBFS using the nudge buttons, or set to the reference level using the REF LEV button.

(3) Tone Interrupt
The Tone Interrupt buttons are useful for testing stereo monitoring and metering. It allows the tone to be interrupted on the left side only, or on the left and right sides in an alternating pattern.

(4) Clearing Oscillator Routes
CLEAR clears all oscillator routes made, providing an easy way of removing test tones from signal paths.

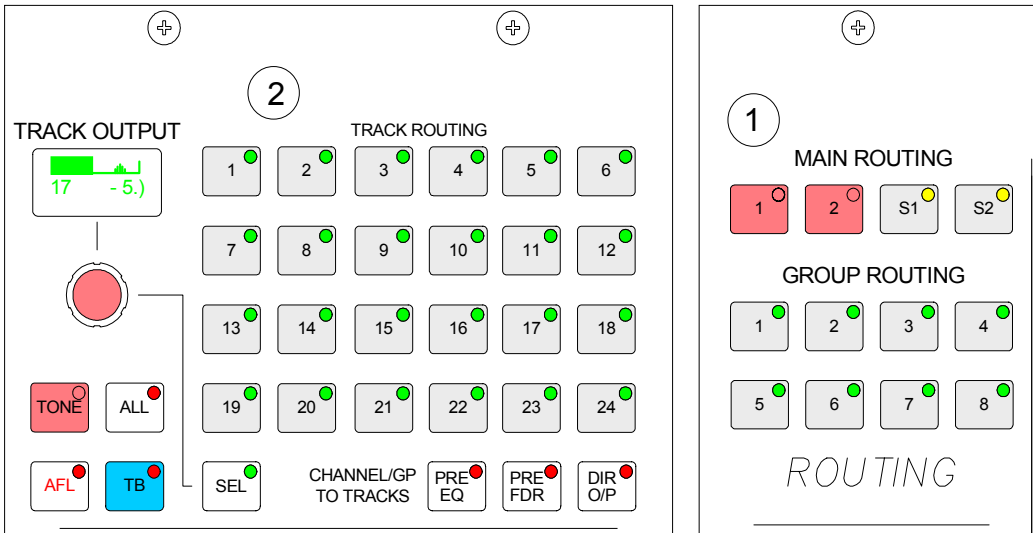
(5) External Input
EXT I/P when pressed replaces the tone with a mono or stereo external source of your choice. This allows for external oscillators to be used if preferred.

(6) Enable Indicator
The Enable indicator shows that the Oscillator controls are enabled.

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. In addition to the indicative LEDs on the fader's channel control section the button LED will light to indicate that the route is made.

(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.

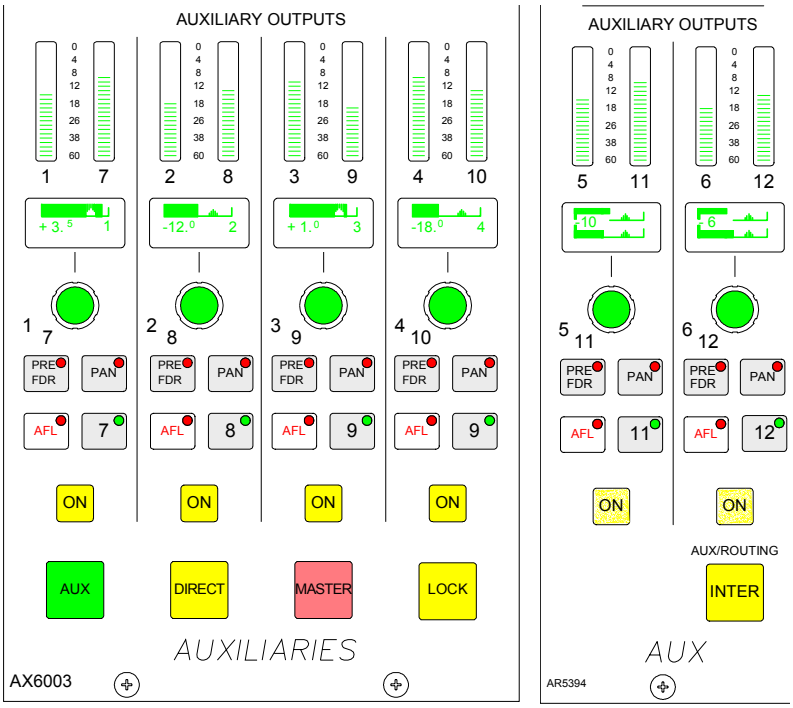
INTER

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

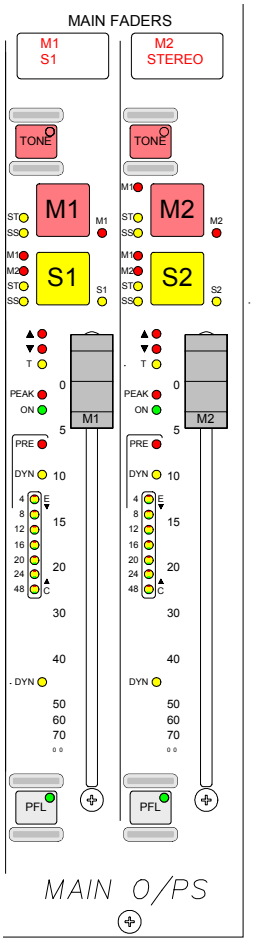
LOCK will lock the panel into output mode. If LOCK is not selected, the panel reverts to Aux if a fader assign button is pressed.

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.

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:

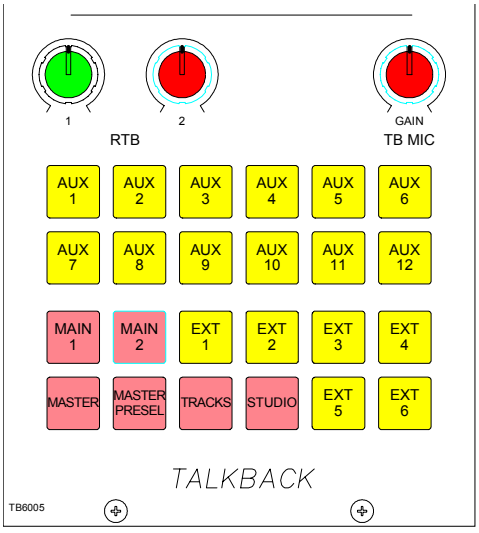
- Routing (of one main to another - indicated on the routing LEDs next to the assign buttons)
- Insert on/off
- Control of the Compressor and direct input

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.

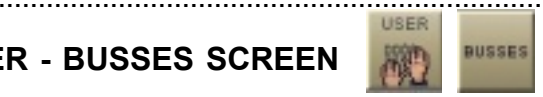
In addition, the MASTER button operates all the TB buttons preselected by the MASTER PRESEL button.

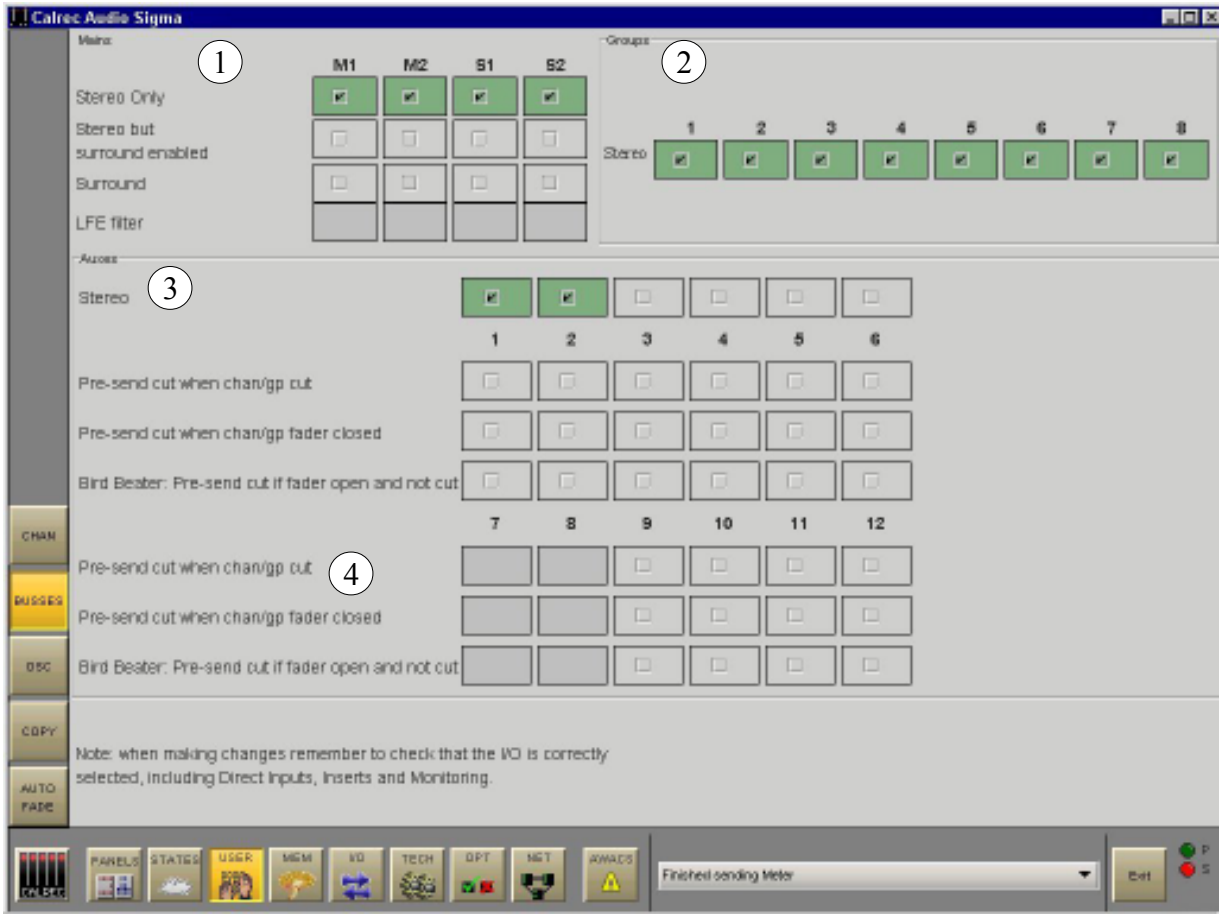
Talkback is also available using the buttons on the fader modules, Input/Output panel and Track routing panel, to direct outputs and individual tracks.

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.

USER - BUSSES SCREEN





(1) Mains
Each main and sub-main output can be set to be stereo or surround here.

(2) Groups
Group busses can be selected to be mono or stereo. Stereo channels feed a mix of left and right to mono groups. Mono channels pan L/R to stereo groups.

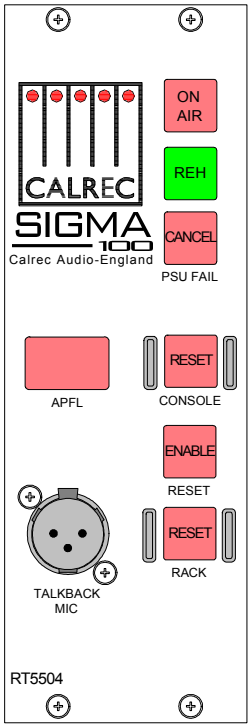
(3) Auxiliary Busses
Mono Aux busses can be paired up to make stereo auxes. When a pair of auxes are changed in this way, all settings of the pair are cleared.

(4) Pre-send Cut
Options are available for the pre-send to be cut :

- when the channel or group is cut
- when the channel or group fader is closed
- when the fader is open and not cut (Bird Beater). This option cancels the other two pre-send cut options.

The bird beater option mutes the auxiliary pre-fader send when it's fader is open and not cut. Therefore, closing the fader or using the cut switch enables the auxiliary pre-fader send. One use of this feature is to give the producer a feed to the "cue speaker" when the announcer or commentator microphones are closed during a commercial or other break in a live broadcast.

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 Automatic Warning and Correction System (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. Selecting a message will reveal a more detailed description. 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. f un-cleared errors are still present, an icon will flash in the AWACS button. Selecting this button at any time will switch back to the AWACS screen. Information messages can be cleared by selecting them and then leaving the AWACS screen. Warning and Fatal Error messages can only be cleared by clearing the error and restoring the system to its normal operational state.

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.

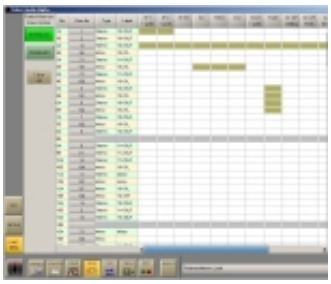
GLOBAL CONSOLE CLEAR - Clears the console of all settings

REPLAY - This button is not used.

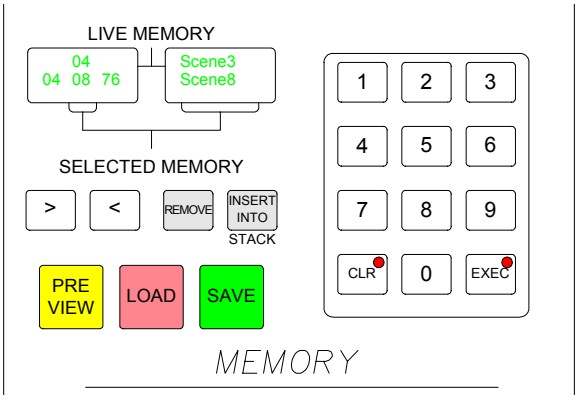
Clear, Aux Clear, Default Set-up and Console Clear flash when pressed and require the EXEC button to be pressed before the operation is carried out. It is recommended that settings are saved to memory before these functions are used.

Memory System






MEMORY CONTROLS



99 memories can be held in the Flash ROM for different console arrangements. In addition , the PC back-up can allow an unlimited number of memories, which are easily recalled into the Flash ROM . Memories can be stored to removable media, which can be useful 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

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 Selected Memory. Alternatively, SAVE+Memory Number + EXEC will save into that memory number. To create a new memory, choose an empty memory from the list on the left of the Mem-Setup screen, either by clicking on it, or by typing its number on the keypad. Memories can be given a user-friendly label on the Mem-Setup screen.

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 live settings will be displayed again.

Stacked Memories

Memories can be arranged into a pre-set list, known as a stack. This is 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 on the MEM-SETUP screen. INSERT INTO STACK adds the Selected Memory to the stack. The > and < buttons scroll through the stack. Pressing both > and < together, will reset the position so that the last number loaded is back in the central position.

To allow the stack to use the Selected Memory position, any memory which has been selected manually, and is not part of the stack (shown in inverse text), must first be removed from the Selected Memory position, by pressing REMOVE. If REMOVE is pressed while a stack memory occupies the Selected Memory position, it will be removed from the stack. A second press will remove it from the Selected Memory position.

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 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 automatically move to the Selected Memory position after the previous Selected Memory has been loaded from the stack.

All the available Flash ROM memories are listed on the memories screen, and when selected will occupy the Selected Memory position. Memories will be shown as empty if they have not yet been used. To create a new memory, choose an empty memory from the list either by selecting it, or by typing its number on the keypad in the memory section of the control surface.

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

When loading, saving or clearing memories from the memories screen, a confirmation box must be accepted before the action is carried out to prevent memories from being accidentally overwrittten, cleared or loaded onto the console at an inappropriate time. When a stored memory is loaded, the system checks that the current desk configuration matches that of the stored memory. If there are discrepancies, a warning message is reported.

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 Mem-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.

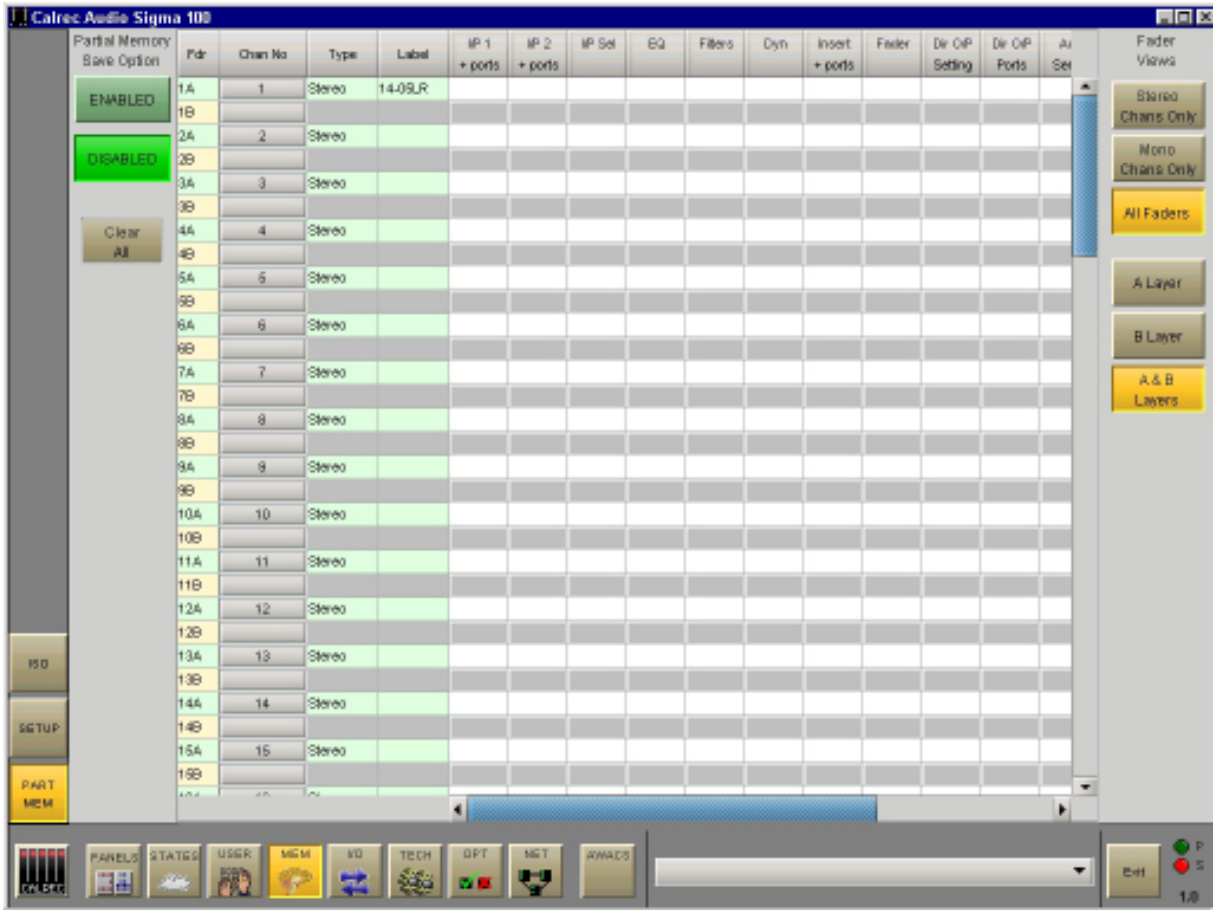
When an input is isolated or de-isolated, its port will also be isolated or de-isolated. However, the I/O screens allow port isolation to be turned on and off independantly. Isolated ports are highlghted in brown on the I/O screens.

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.

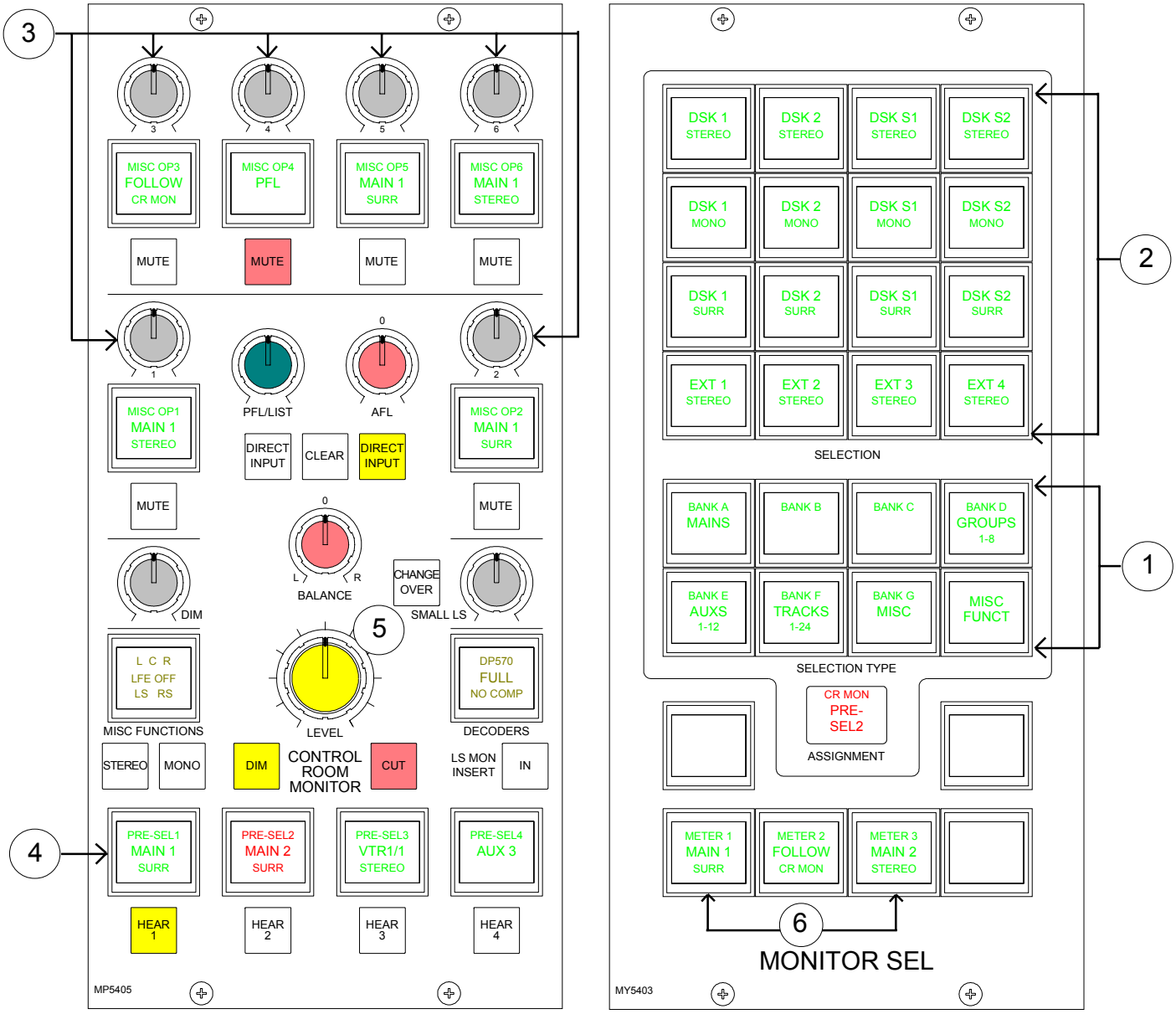
A partial memory only loads those channels or components on the control surface that were selected using the partial memory selections. A partial memory load does not affect the currently assigned fader and the A/B layer assignments.

Monitoring System




ASSIGNABLE MONITORING, METER SELECT AND LS CONTROL

The assignable monitor panels offer a high 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.

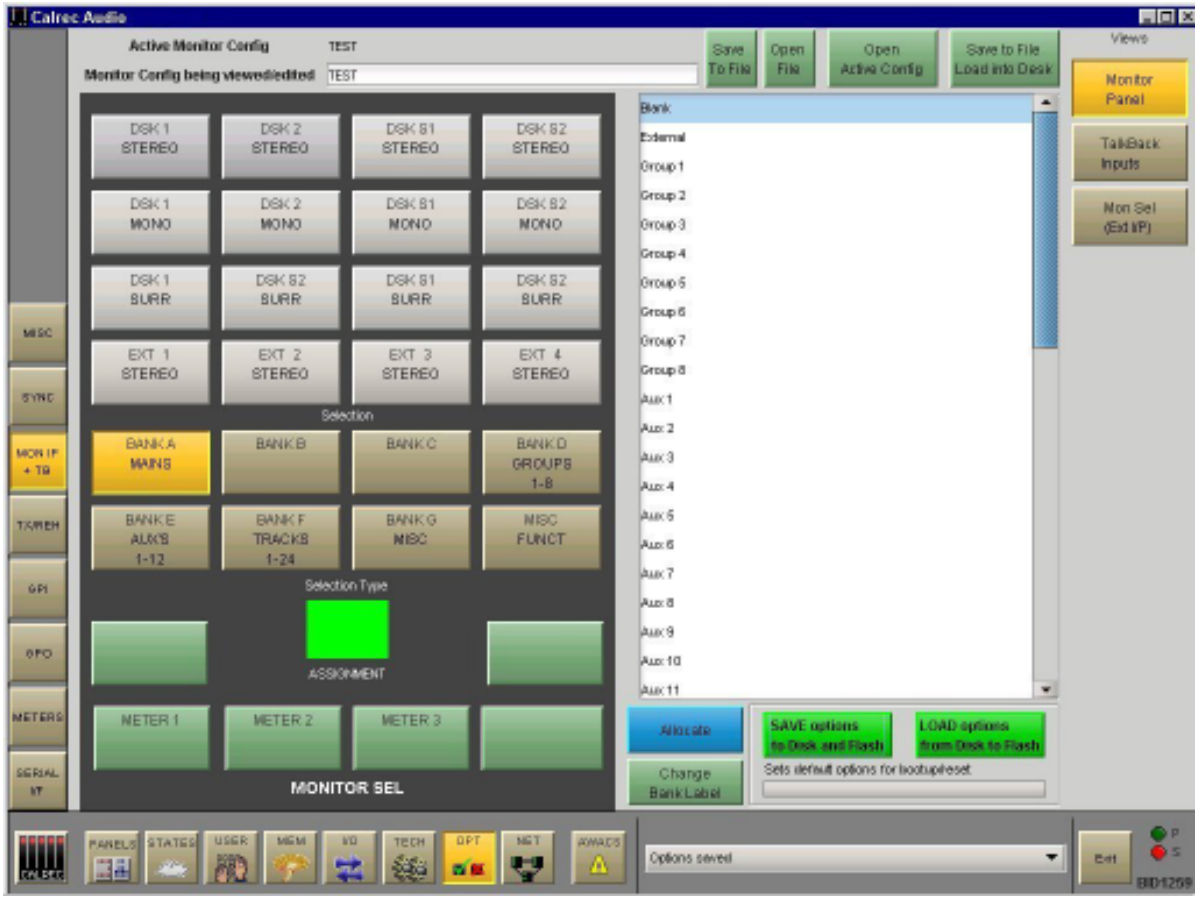
(6) Meter Selectors 1-3
Any of the available sources can be assigned to 3 meter selectors 1, 2 and 3.

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.

MONITOR SELECTION 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" 

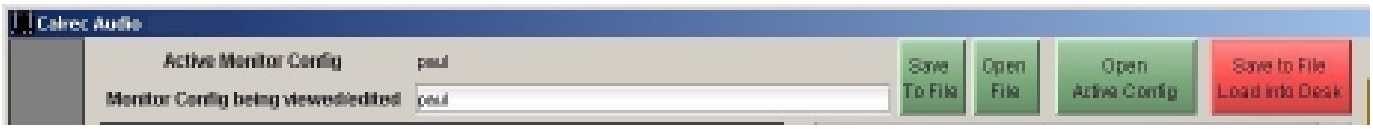
For External sources, a pop up window allows the user to enter a suitable label for the button, and allows the user to choose whether the source is mono, stereo or surround.

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.

Changes to the monitor configuration on this screen will not take effect on the panels until the configuration is saved, and loaded onto the console.

SAVING AND RESTORING MONITOR CONFIGURATIONS

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. The name of the monitor configuration currently active on the control surface will be shown at the top of the screen, and the name of the monitor configuration currently being viewed/edited on the screen will be shown underneath.



Changes to the monitor configuration being viewed/edited will not take effect until SAVE TO FILE LOAD INTO DESK is selected. Then the changes will be transmitted to the panels and saved to **C:/sigma 100/cust1/monitor**. If any changes are made to the monitor configuration, the SAVE TO FILE LOAD INTO DESK button will flash (until selected) to indicate that the changes to the monitor configuration being viewed/edited have not yet been saved and loaded onto the console.

OPEN FILE will allow a previously saved monitor configuration to be chosen. When a file is opened, the configuration will be loaded into the front end screens as "the monitor configuration being viewed or edited", it is not sent straight to the control surface. The monitor configuration can then be edited if desired and when it is ready to be used, select SAVE TO FILE LOAD INTO DESK, and the revised file will be saved and the settings sent to the control surface.

OPEN ACTIVE CONFIG retrieves the settings that the panels are currently using and displays them on the front end screens replacing the current monitor configuration being viewed/edited.

SAVE TO FILE will save the configuration being viewed/edited to **c:/sigma 100/cust1/monitor** without loading it onto the console.

Save Options to Disk and Flash

As the monitor setup screens are part of the options set of screens, it is important to save the options to disk and flash once the monitor configuration is set up.

The Options screens are used to pre-set the system to the studio's required settings. These settings are not stored in the individual console memories but are saved and loaded separately using the buttons at the bottom of the screen. Although the monitor configuration itself is saved seperately, its active state on the console has to be saved using these buttons.

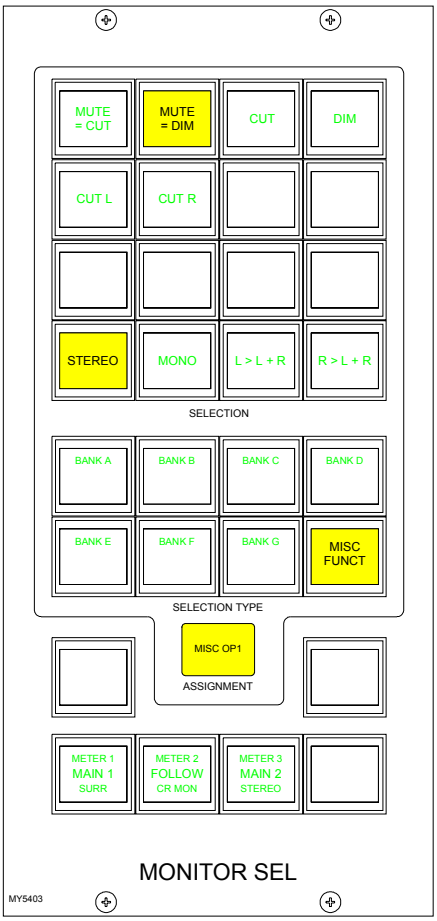
Changes to options take effect as soon as they are made. However, if they are not saved, the next time the desk boots up the options will revert to their previous settings, which could mean that a different monitor configuration is loaded onto the console. This could cause problems should the console have to be reset during a live broadcast. It does however allow changes to be tried out without losing the original settings and these original settings can be restored without having to re-boot the system.

MISCELLANEOUS FUNCTIONS

Misc Output Misc Functions

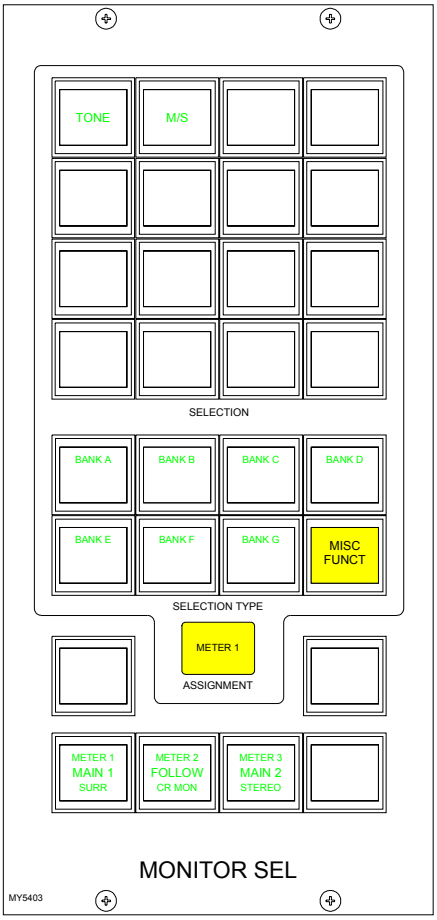
When a misc output is selected, the misc functions bank allows the following functions to be applied.

- 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.

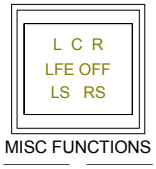


Meter 1-3 Misc Functions

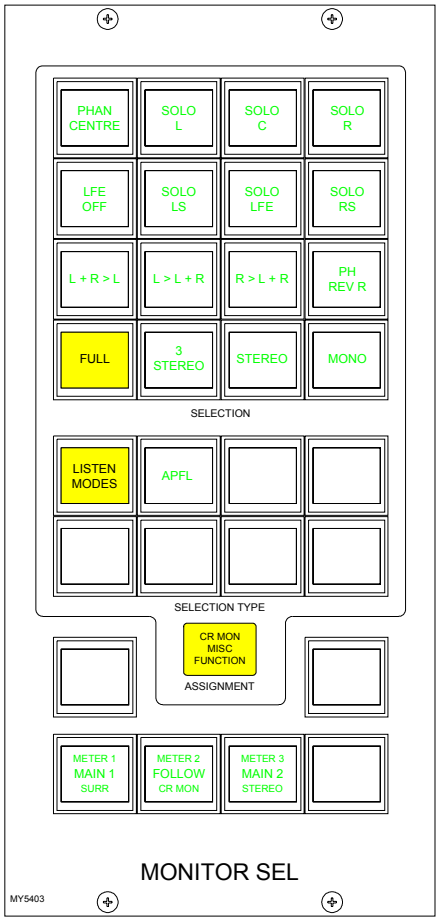
When meters 1-3 are selected, the misc functions bank allows Tone and M/S (L-R sum/difference) to be selected for that meter.



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

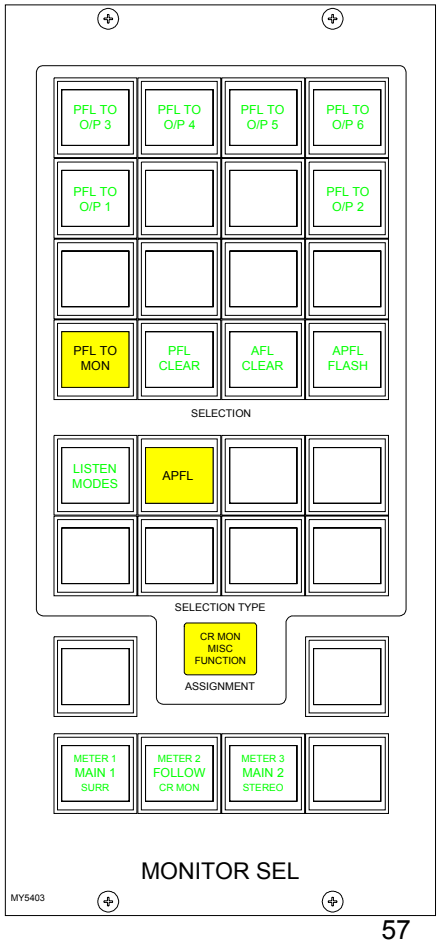
PFL to MON - Feeds the Control Room LS outputs overriding the current LS selection.

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.

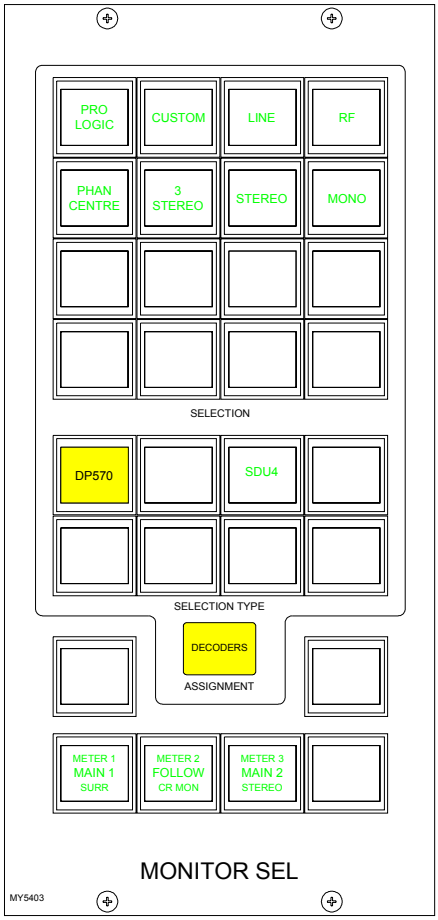
The decoder function buttons are as follows:

- 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.

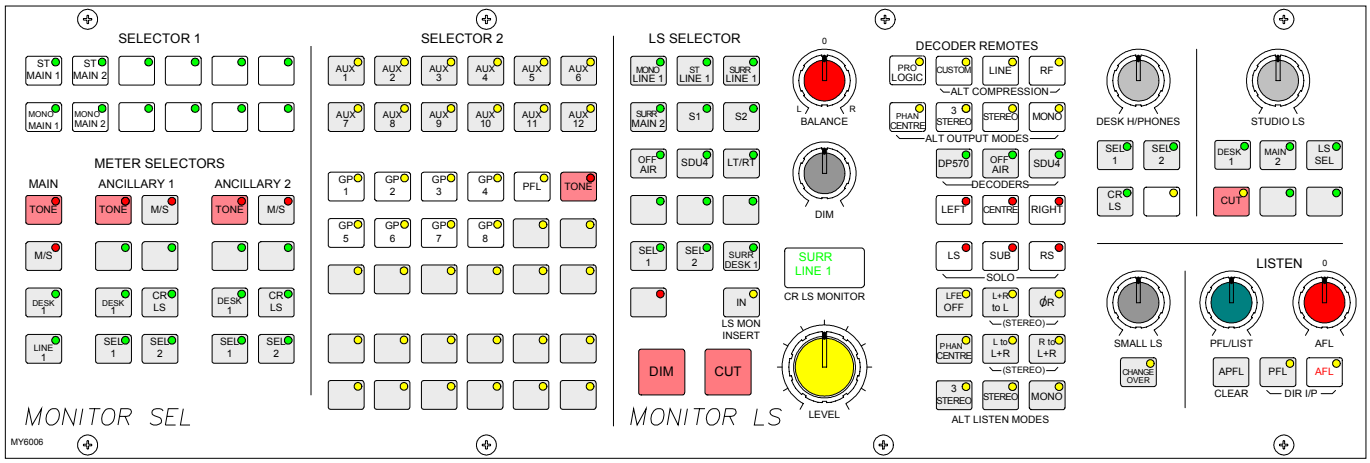
- 3 buttons for Alternate Compression Modes: CUSTOM, LINE and RF. If none are selected, there will be no compression and no dialogue normalisation.

- 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.



MONITOR SELECTOR AND LS PANEL



The Monitor and Meter Selectors are used to select the source to monitor, and what to display on the meters. 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 SMALL LS level control is in series with the main LS level control. The “change over” button diverts the monitor output to the Small LS for near field, or domestic check monitoring. Both main and Small LS can be stereo, 3 stereo, or 5.1 independently.

DIM, CUT and SOLO operate on both sets of loudspeakers. DIM and CUT can be externally operated and controlled from the TB using condition switching, set up on the 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 still 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 the stereo (downmix) output of that main 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 independently either stereo, 3 stereo or 5.1, Studio LS2 can be 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 really 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.
- When controlling a Dolby SDU4, LT/RT decoder, only the stereo and mono, output mode buttons will function.

Meter Selectors

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.

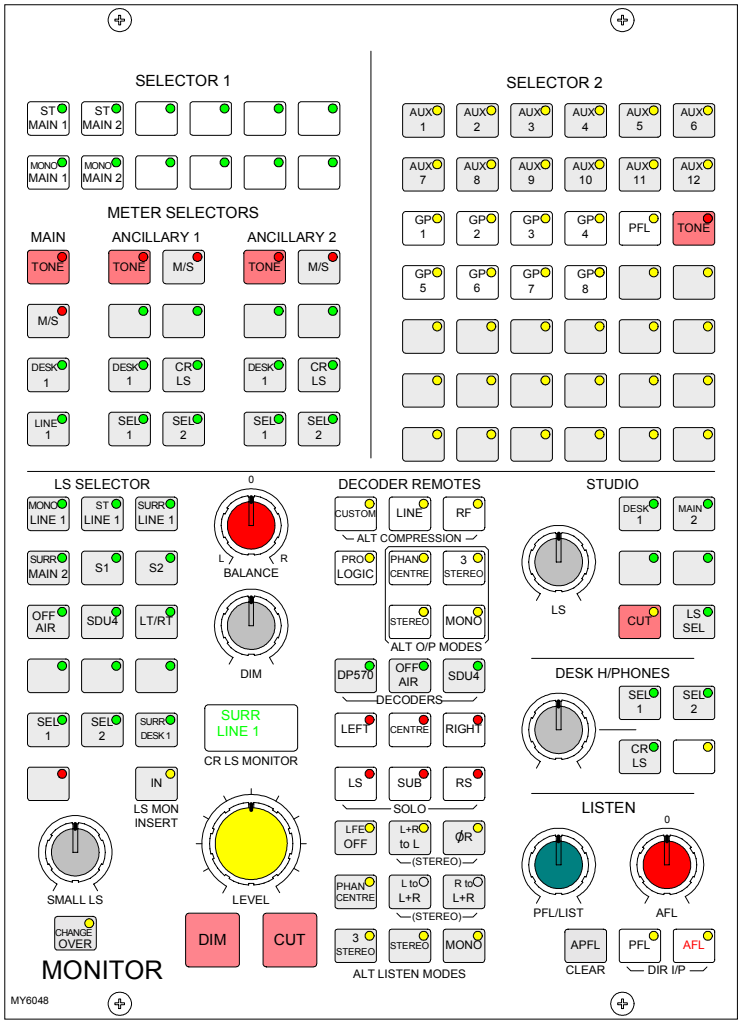
The main and ancillary 1 meters can both be stereo only, surround only, or surround plus stereo, with an optional separate M/S (L-R sum/difference) meter.

The Ancillary 2 meter can be selected to meter the Control Room LS monitor selection, Main 1 Desk, Sel 1 or 2, or 2 external inputs. It 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.

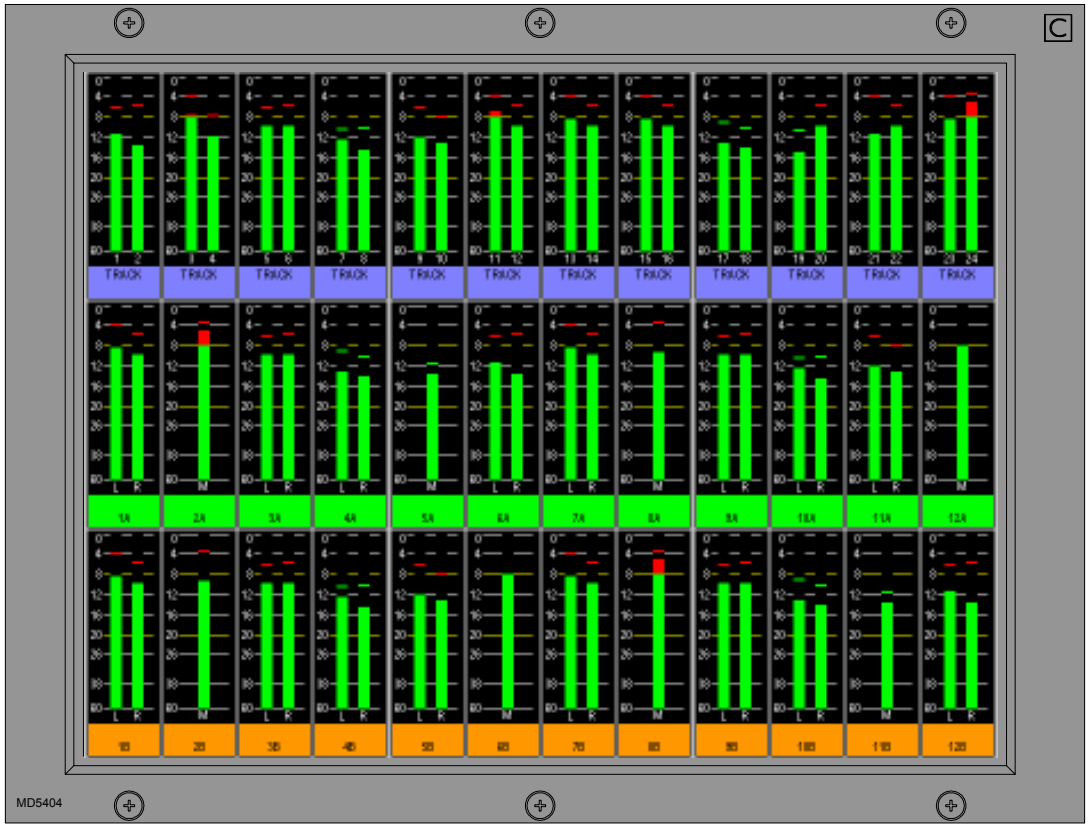
Portrait Monitor Panel

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 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:

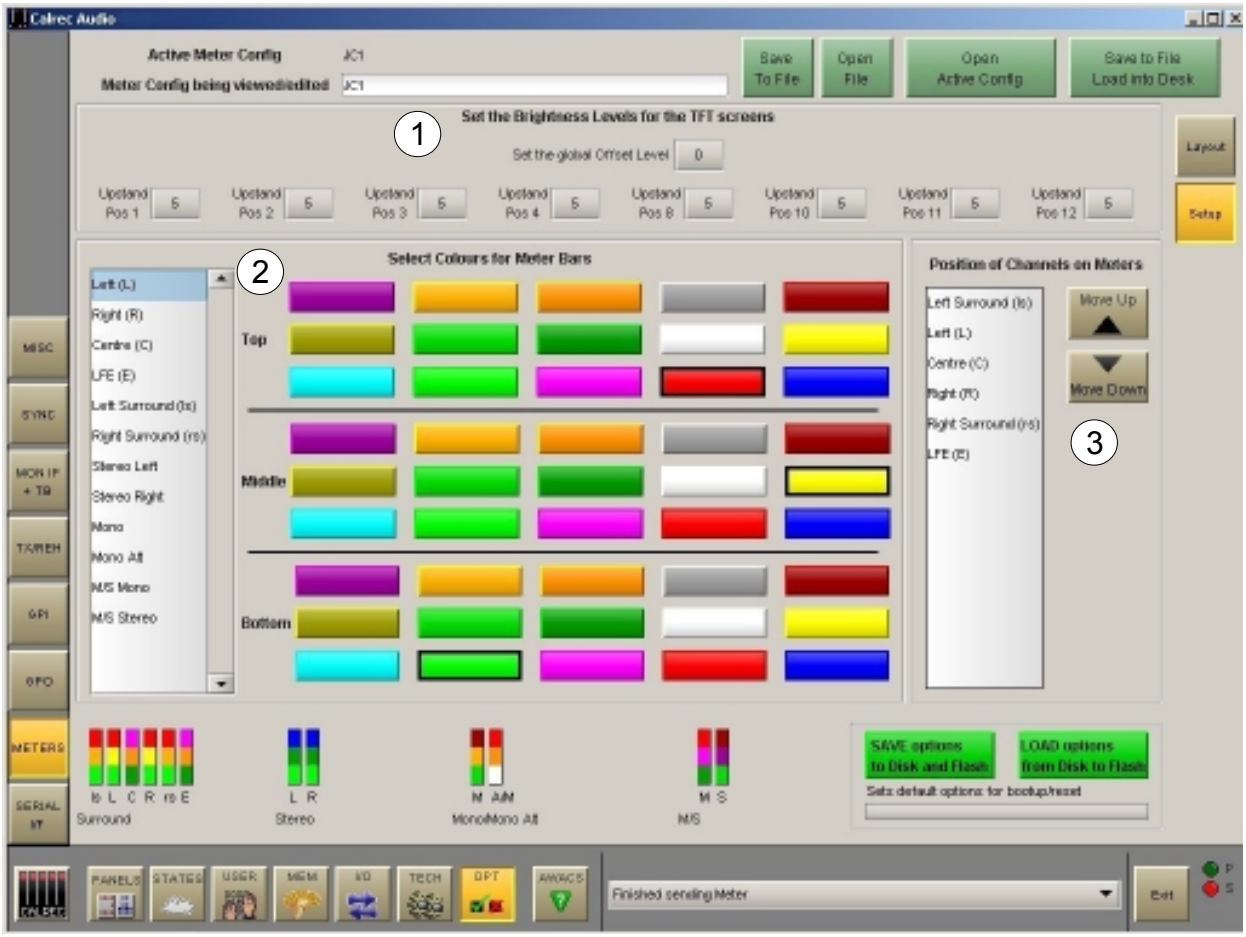
- Channel inputs, A and B paths (simultaneously, or set to follow A/B assign button).
- Main Outputs
- Group Outputs
- Track Outputs
- External Inputs
- Auxiliary Outputs
- Meter Selectors
- Miscellaneous functions

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

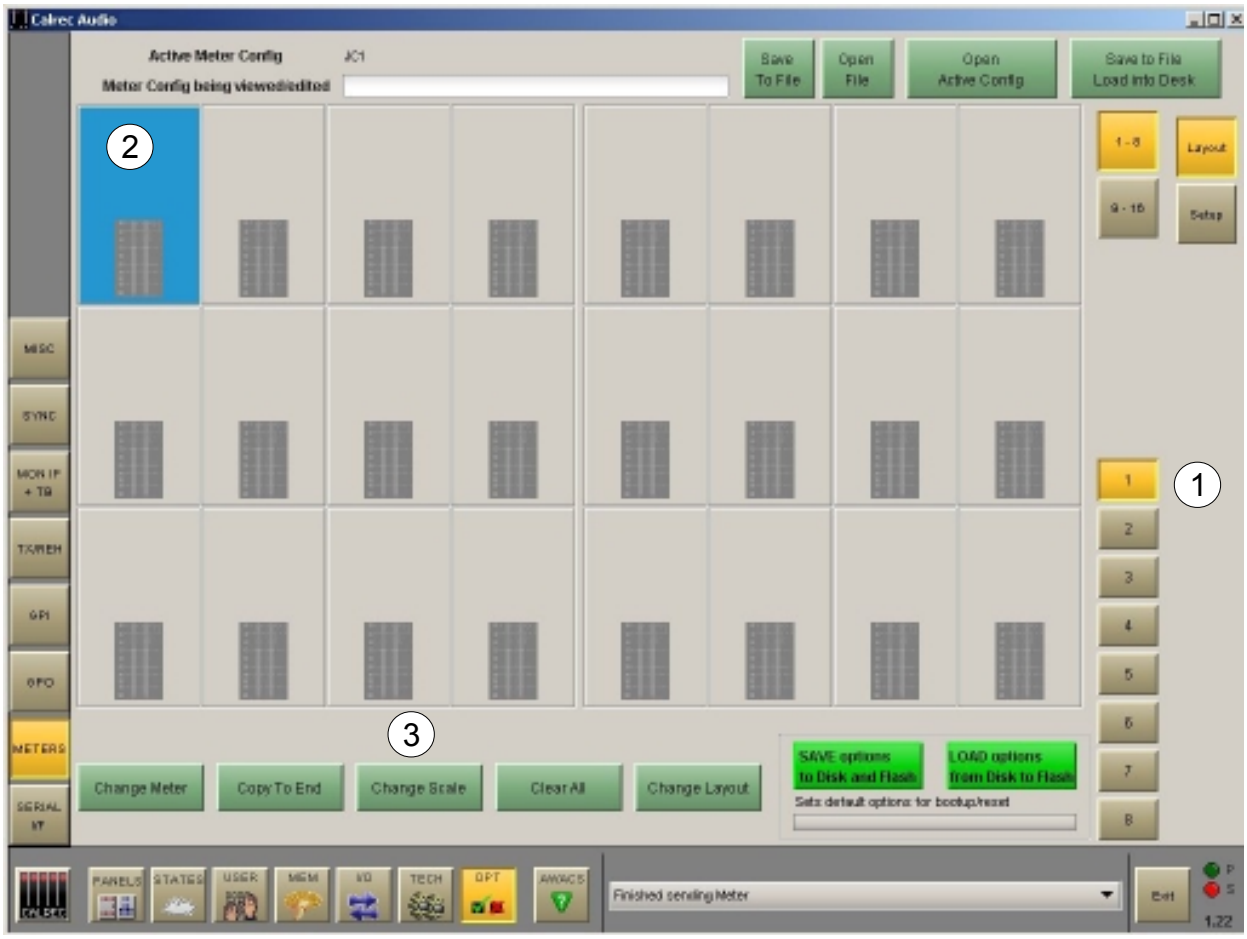
The user can select the colours to be used on the meters. The top,middle and bottom colours for each signal can be selected independently using the pallette. The selected colours for each signal are shown at the bottom of the screen.

(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.

OPTIONS - METERS - LAYOUT SCREEN

The user can (with some rules) control the layout of the screens.



(1) Meter Selection

The Set up Application provides an interface with which to tell the console which meter panels occupy which position along the upstand. The numbered buttons on the above front end screen allow the meter panel in that upstand position to be selected for set-up.

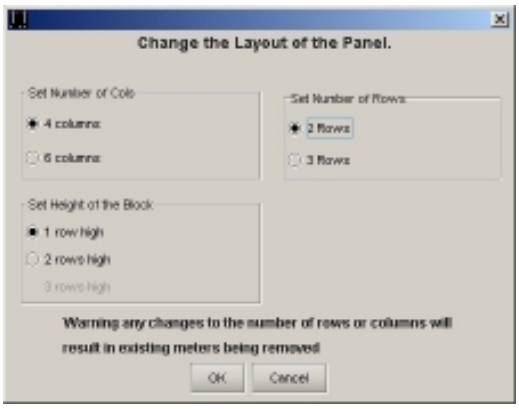
(2) Meter Layout

The selected meter will be shown in the main section of the screen, where the meter positions will be greyed out until the user defines the type of meter to show in that position. Before the meters are defined, it is a good idea to define the layout of the rows and columns on the screen. Some of the meter positions can be left unused.

(3) Functions

The controls at the bottom of this screen allow changes to the meter to be made. The layout of the graphs to be displayed on the screen can be arranged using CHANGE LAYOUT. The type of meter and its source can be defined using CHANGE METER. The scale can be set using CHANGE SCALE. COPY TO END copies the selected meter across the rest of the meters in the row. CLEAR ALL resets the meter arrangement, clearing all settings.

CHANGING TFT SCREEN LAYOUT



Select a meter (its background will turn blue) and select CHANGE LAYOUT. A dialogue box will appear to allow the number of columns and rows in the selected meter's half of the screen to be chosen.

The selected meter's height is also determined here. The meter's height can span the rows available in the column.

Rows

The number of rows within the selcted meter's column can be selected here. 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 will affect meters in the selected meter's half of the TFT meter screen only.

Columns

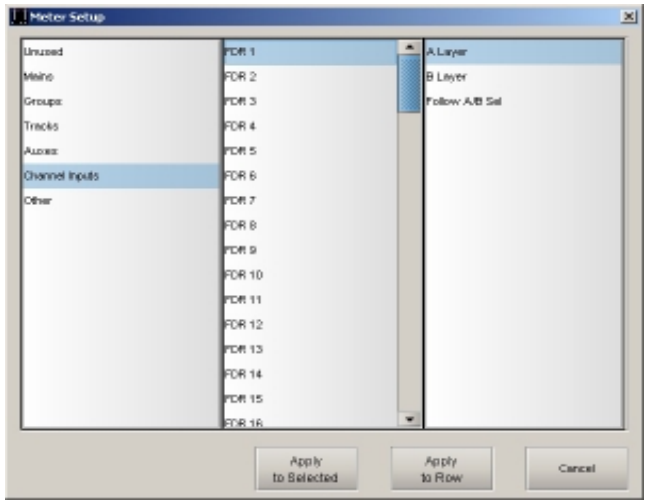
There can be either 4 or 6 columns in each row across each half of the screen. As the screens are set up in halves, this means that there can be different column widths on each side of one screen. Changing the number of columns will affect meters on the selected meter's row only (Unless the change affects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

Block Height

In a column with 2 rows, selecting 1 row high makes the meter take up one 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 just one row (1/3 of the 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 it within its column. Selecting 3 rows high makes the meter the full height of the column it occupies.

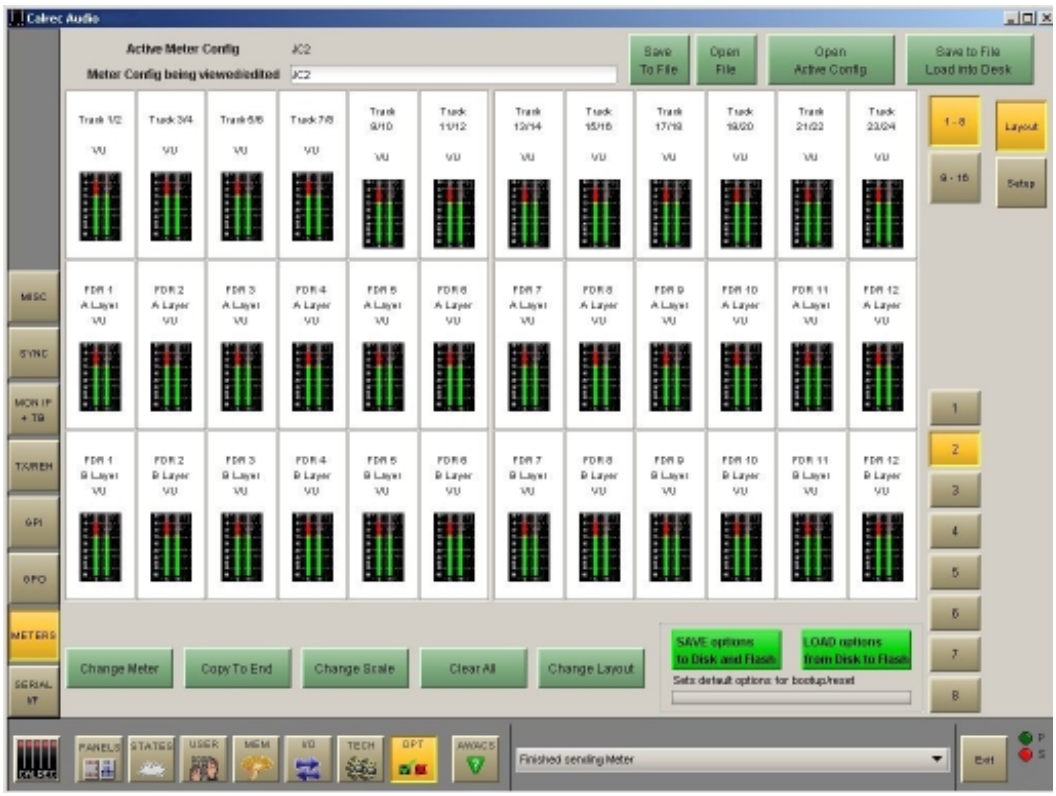
CHANGE METER



Select a meter position (its background will turn blue) and select CHANGE METER. A dialogue box will appear which allows the meter source to be chosen. Select the required source to monitor, from Mains, Groups, Auxes, Channel Inputs or Other. Subsequent columns will list the available options for that source. When all options are selected, APPLY TO SELECTED will apply the source to the selected meter position only. APPLY TO ROW will apply that source to the selected meter position, and subsequent sources in the list will be applied 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.

Channel Inputs

When selecting a channel input 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 path selection (A or B) for that fader number.



Change Scale

Each bargraph can be PPM, VU or Phase. There can be up to 3 phase meters assigned in the configuration, after all three have been assigned the option will no longer be available. The scale type can be selected on either an individual basis or an “apply to all”. This applies for both standard and TFT meters. Scales available to the user are set in the Set up Application from a longer list than the system is capable of.

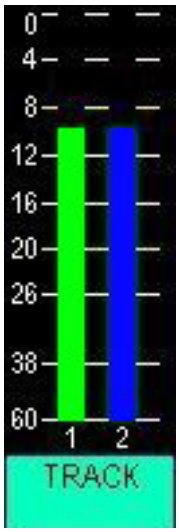
METER OPTIONS

The table below shows the options available for display.

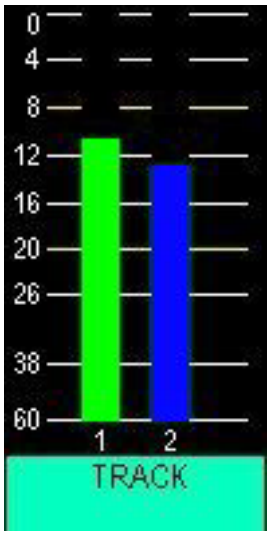
Source	Option 1	Option 2
Unused		
Mains	Mains 1-2 Desk	Stereo or Surround, Stereo (Lo Ro), M/S, Stereo Phase
	Sub-Mains 1-2 Desk	Stereo or Surround, Stereo (Lo Ro), M/S, Stereo Phase
	Mains 1-2 Line	Stereo or Surround, Stereo (Lo Ro), M/S, Stereo Phase
	Sub-Mains 1-2 Line	Stereo or Surround, Stereo (Lo Ro), M/S, Stereo Phase
	Mains 1-2 Pre	Stereo (Lo Ro), M/S, Stereo Phase
	Sub-Mains 1-2 Pre	Stereo (Lo Ro), M/S, Stereo Phase
	Mains 1-2	Stereo or Surround, Stereo (Lo Ro), M/S, Stereo Phase
	Sub-Mains 1-2	Stereo or Surround, Stereo (Lo Ro), M/S, Stereo Phase
Groups	Groups 1-8	Mono or Stereo, Phase
Tracks	1-24	Tracks 1/2 - pairs or in fours
Auxes	Aux 1-12	Aux 1/7, Aux 2/8 etc
Channel Inputs	FDR 1-64	A Layer, B-Layer, Follow A/B Sel
Other	Main Meter Sel	Surround, Stereo (Lo Ro), M/S, Stereo Phase
	ANC 1 Mtr Sel	Surround, Stereo (Lo Ro), M/S, Stereo Phase
	ANC 2 Mtr Sel	Stereo (Lo Ro), M/S, Stereo Phase
	PFL	Stereo, M/S, Stereo Phase
	AFL	Surround
	APFL	Stereo, M/S, Stereo Phase
	CRLS	Surround, Stereo (Lo Ro), M/S, Stereo Phase
	Mix Minus	Mono
	External	Stereo, M/S, Stereo Phase

Tracks

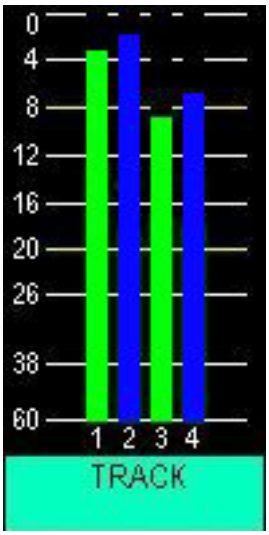
2 Tracks can be displayed in any single meter position. However, if the meter position occupies a column which is 1/8 of the screen width (that half of the screen being set to 4 columns wide), then 4 tracks can be displayed allowing the track metering to occupy a smaller space. When selecting Tracks to meter, the first available options column allows two tracks to be selected for display in that meter position. The next available options column will then allow selection of the next two tracks (provided that the selected meter position is 1/8 screen width). If selected, all four tracks will be displayed within that meter position. It is useful to change the colours for pairs of mono meters such as tracks, so that the left of the pair is a different colour to the right.



1/12 wide meter, displaying 2 tracks



1/8 wide meter, displaying 2 tracks



1/8 wide meter, displaying 4 tracks

SAVING AND RESTORING METER CONFIGURATIONS

Once the user has the meters set up as desired, the configuration can be saved to the PC's hard disk, so that it can be recalled at a later date. A configuration consists of the values set on the SETUP screen and the layouts designed on the LAYOUT screen. The currently active configuration will be shown at the top of the Setup and Layout screens, and the configuration currently being viewed/edited on the screens will be shown underneath.

Save to File, Load into Desk
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 transmitted to the console and saved to **C:/ sigma/cust1/meter**. If any changes are made to the configuration, the SAVE TO FILE LOAD INTO DESK button will flash (until selected) to indicate that the changes to the configuration being viewed/edited have not yet been saved and loaded onto the console.

Open File
Open File will allow a previously saved meter configuration to be chosen. When a file is opened, the configuration will be loaded into the front end screens as "the meter configuration being viewed or edited", it is not sent straight to the control surface. The settings can then be edited if desired and when they are ready to be used by the control surface select SAVE TO FILE LOAD INTO DESK, and the revised file will be saved and the settings sent to the control surface.

Save to File
Save to File will save the configuration being viewed/edited to **c:/sigma 100/cust1/meter** without loading it onto the console.

Open Active Config
Open Active Config retrieves the settings that the control surface is using and displays them on the front end screens replacing the current configuration being viewed/edited.

Save Options to Disk and Flash

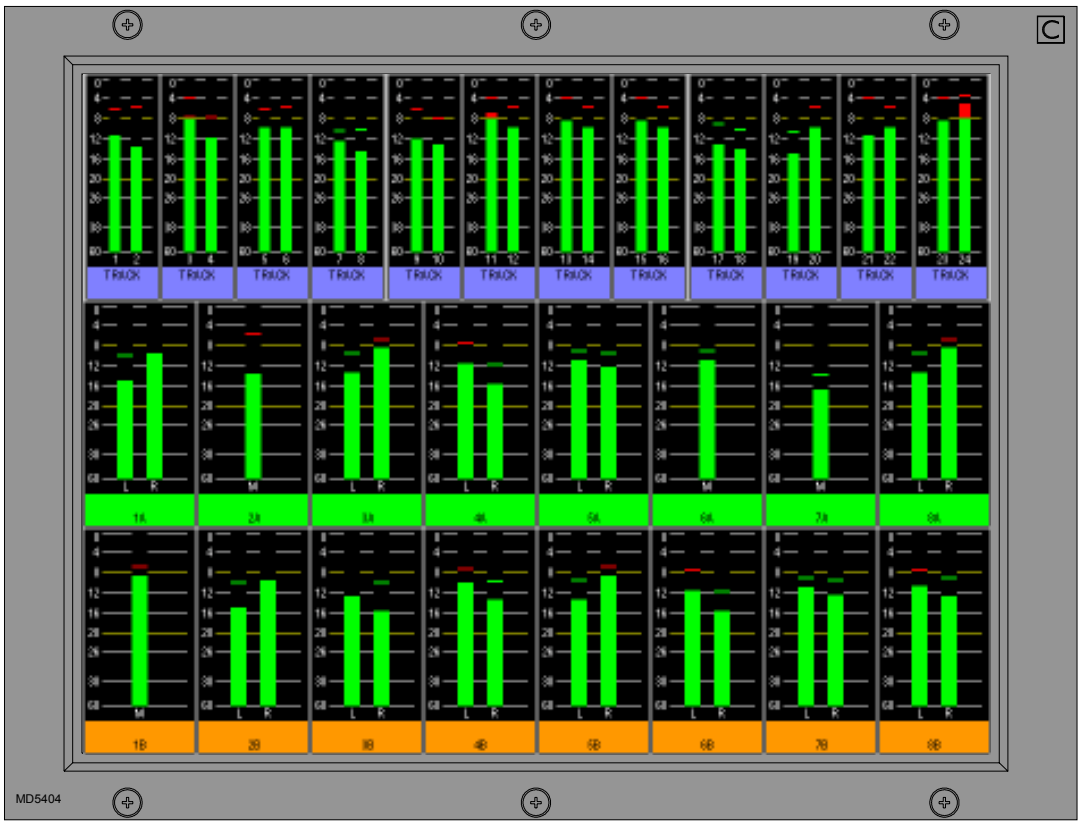
As the meter setup screens are part of the options set of screens, it is important to save the options to disk and flash once the meter arrangement is set up. The Options screens are used to pre-set the system to the studio's required settings. These settings are not stored in the individual console memories but are saved and loaded separately using the buttons at the bottom of the screen. Although the meter arrangement itself is saved seperately, its active state on the console has to be saved using these buttons.

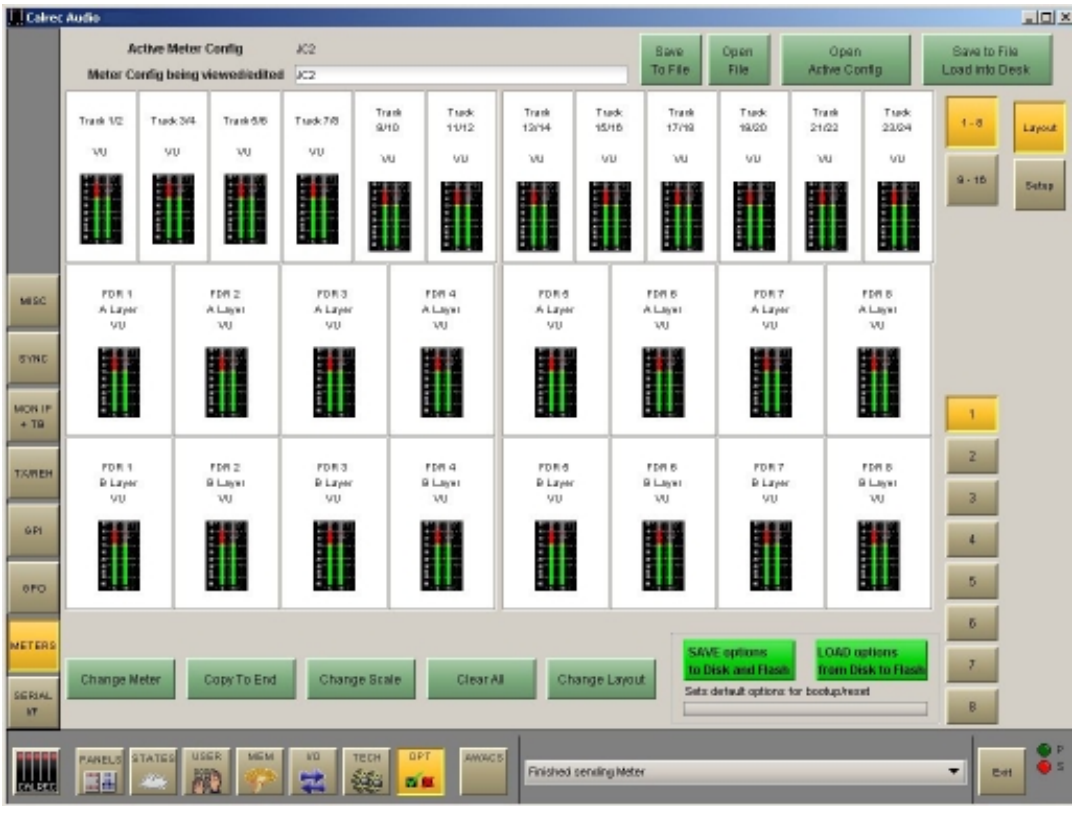
Changes to options take effect as soon as they are made. However, if they are not saved, the next time the desk boots up the options will revert to their previous settings, which could mean that a different meter arrangement is loaded onto the console. This could cause problems should the console have to be reset during a live broadcast. It does however allow changes to be tried out without losing the original settings and these original settings can be restored without having to re-boot the system.

TFT CONFIGURATION EXAMPLES

Example 1

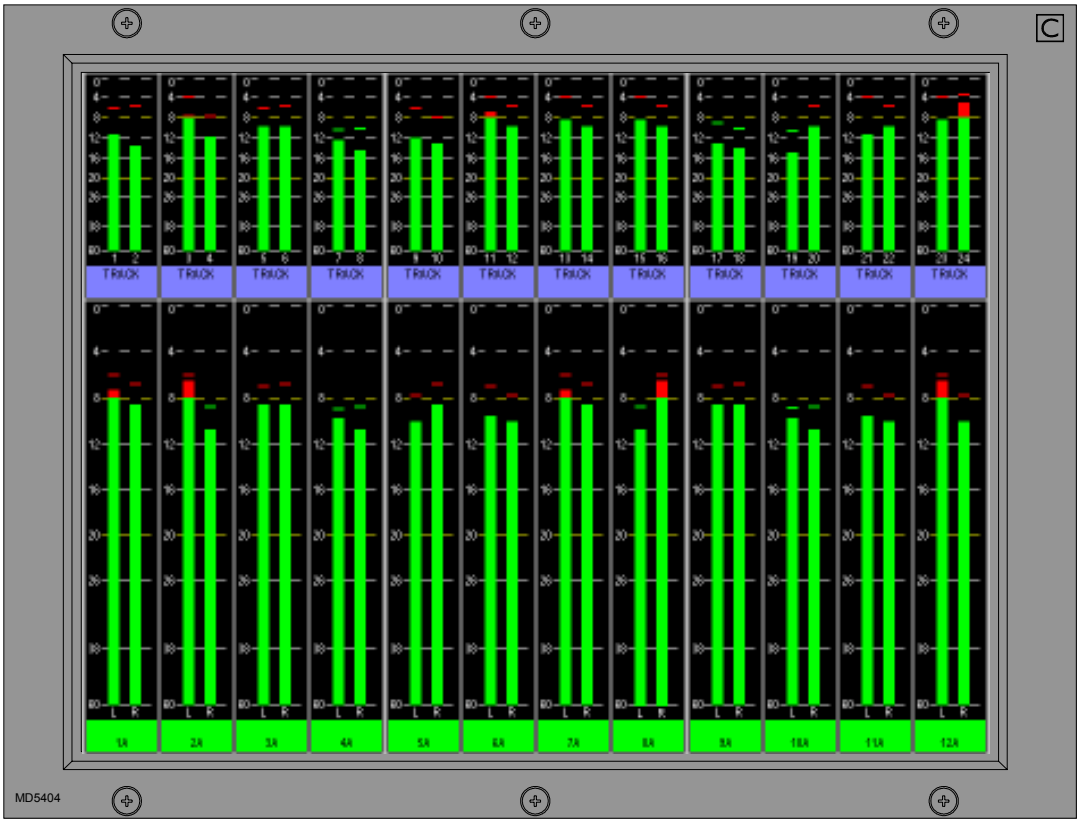
In the example below, the TFT meter screen has been split up into three rows. The top row has been spllit up into 12 meter positions to house the tracks, and the middle and bottom rows have been split up onto 8 meter positions across, to house the channel inputs for the A and B paths respectively. When there are 8 meter positions on a row across the width of a TFT screen, the meter positions will line up with the faders occupying that section of the console.

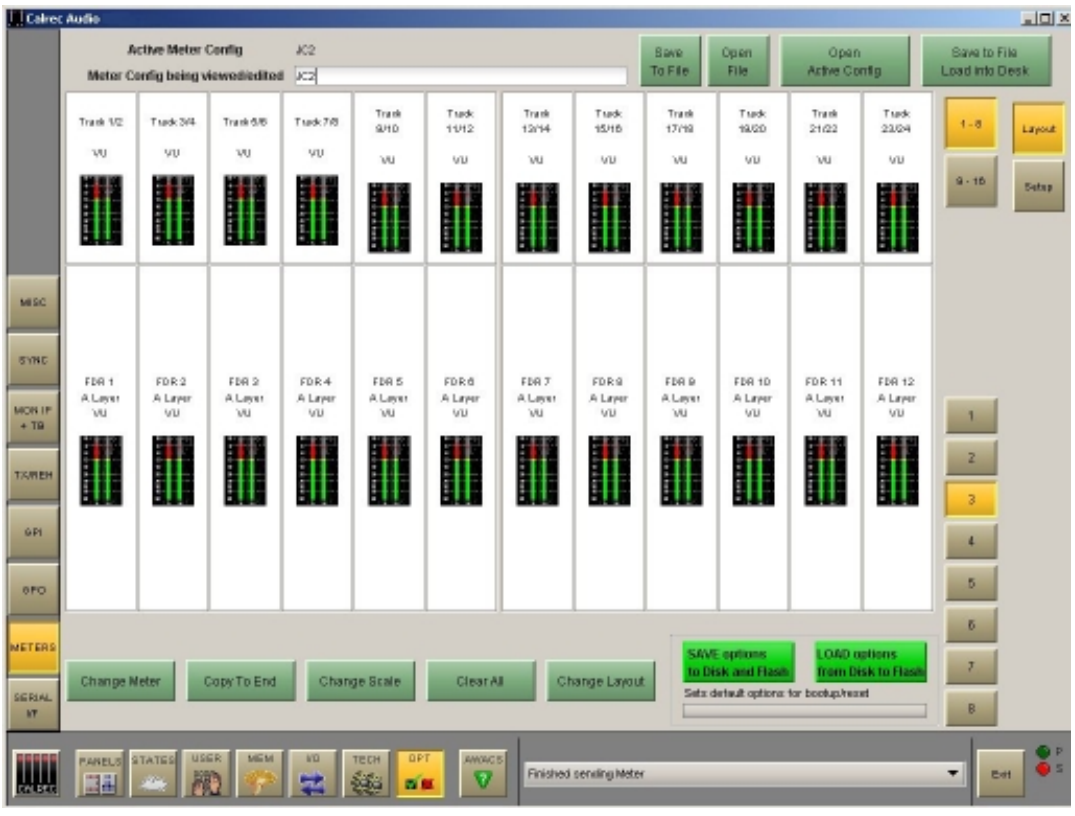




Example 2

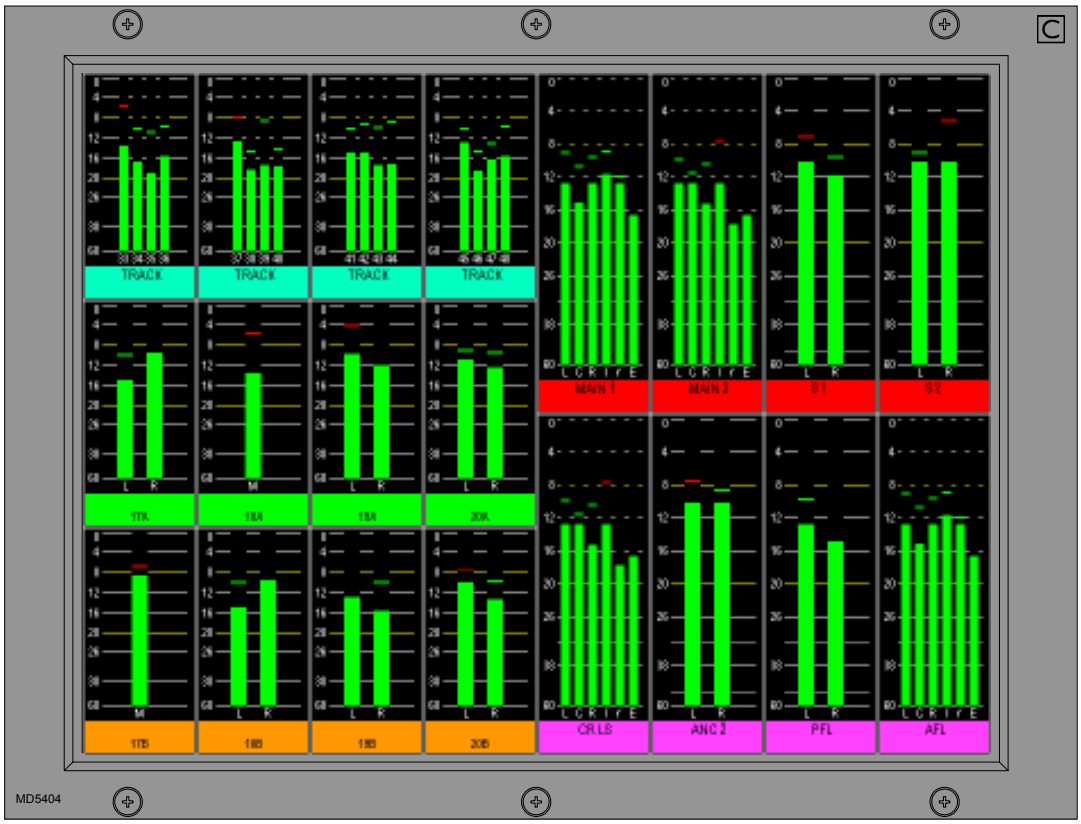
In the example below, the TFT meter screen has been split up into two rows with 12 meter positions across each row. The top row takes up 1/3 of the height of the screen, and is occupied by tracks. The bottom row takes up 2/3 of the height of the screen, and is occupied by A path channel inputs.

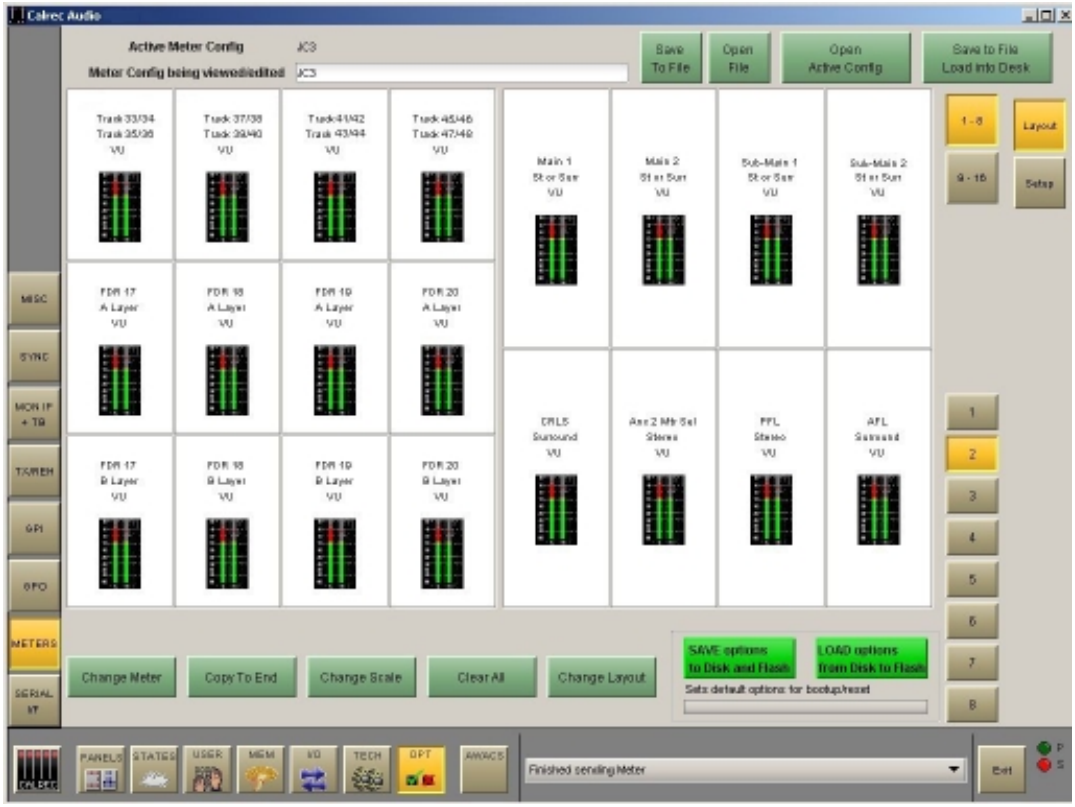




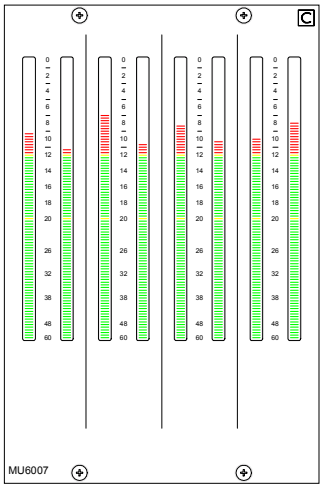
Example 3

In the example below, the TFT meter screen has different row sizes on each half. In the first half, the top row houses graphs showing four tracks, allowing 16 tracks across half of the screen. The middle and bottom rows display channel inputs for A and B paths respectively. The second half of the screen has been split into two rows, each taking up half of the screen's height. Across the top half are the main output meters, and the bottom half displays CRLS, Ancillary 2, PFL and AFL.

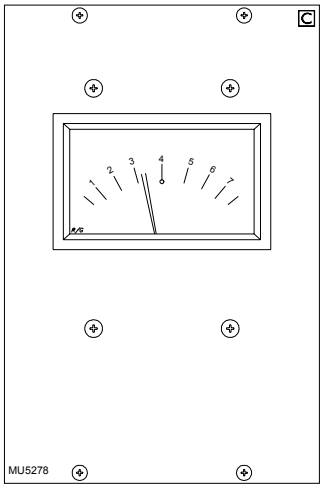




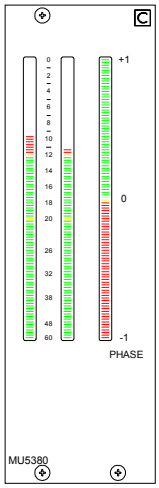
BARGRAPH AND MOVING COIL METERS



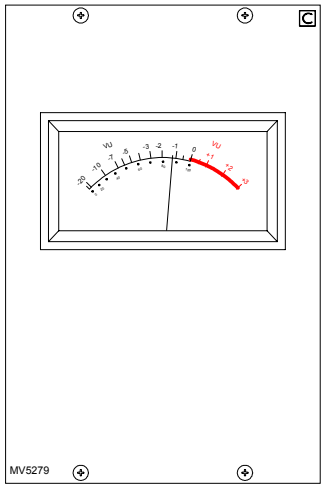
4 x Twin Bargraph



PPM Meter R/G (A/B)



Phase Meter Bargraph & Stereo Bargraph

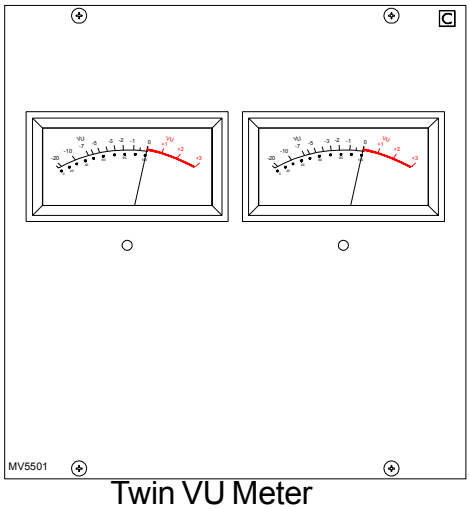


VU Meter

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

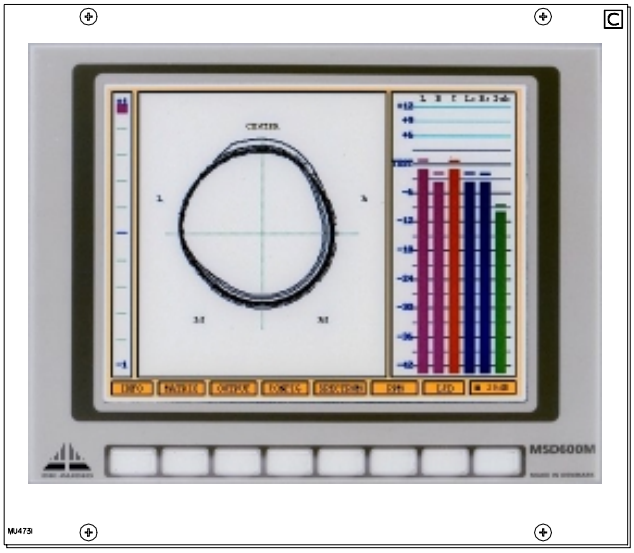
All Calrec meters including moving coil types, are fed directly from the meter processor. There are external meter outputs which allow other meters to be used.

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.

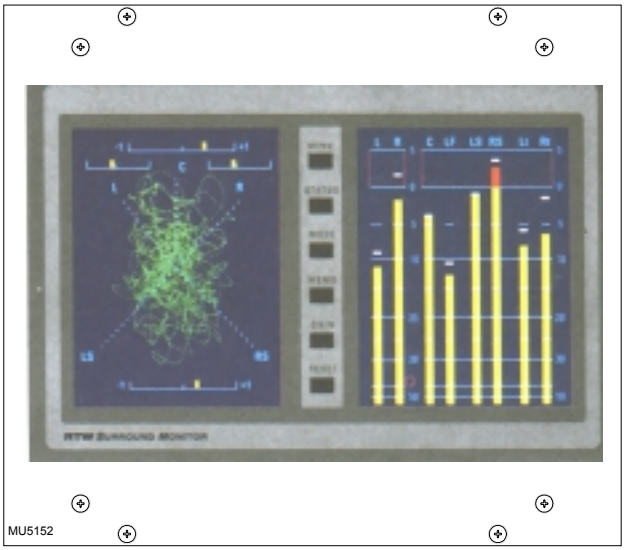
The meter bridge is continental height allowing alternative European bargraph meters to be fitted. These would require audio outputs from the I/O Rack.

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.



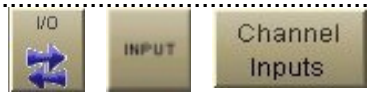
DK Audio MSD600M



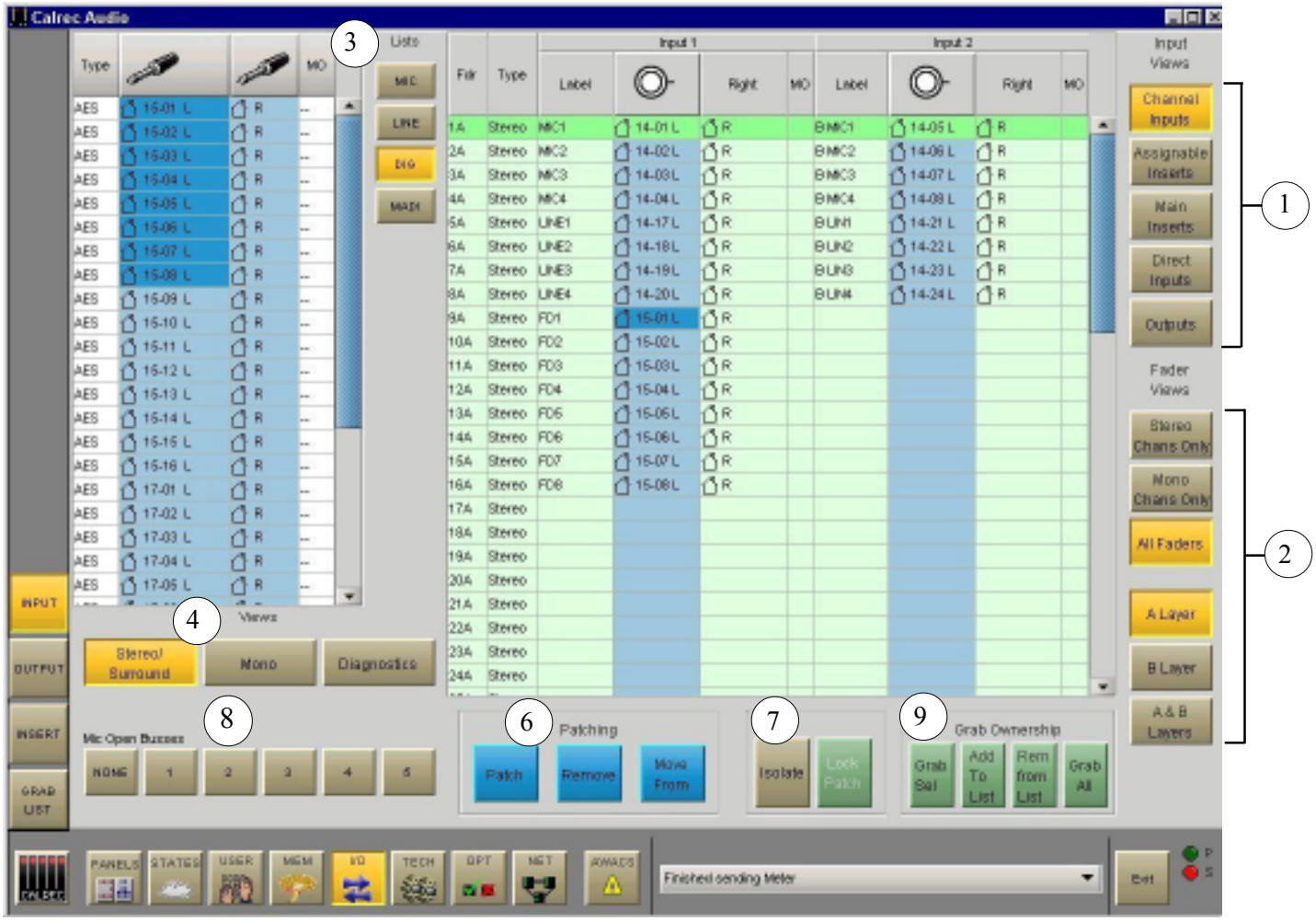
RTW 10810

On-Screen Patching

INPUT PORTS SCREEN



The I/O-Input screens allow “Patching” of input sources to channel inputs, insert returns, direct inputs or to output ports. As an option, the Sigma can incorporate an Input/Output Matrix Panel, so that patching can be done from the control surface.



(1) Input Views

These buttons select the different console path types which can have ports attached. (channel inputs, insert returns, direct inputs or outputs). They will then be displayed in the main section of this screen.

(2) Fader Views

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

(3) Source Lists

All of the available input ports can be grouped into suitable lists at the time of installation. These lists can then be accessed using the selection buttons. When selected, their sources are displayed on the left of the screen, ready to be patched to channels on the right.

(4) Source Viewing Options

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

(6) Patching
Assignment is made by selecting a source,  and an input,  and selecting Patch. 

The input source label will appear in the channel input label field and on the fader on the console (if that input, 1 or 2, is selected on the Input/Output panel). By selecting the label cell on the screen, the input name can be edited. The new name is stored with the channel input and replaces the source label on the fader display.

Once patches are made, they can be removed when selected by clicking REMOVE. Connections can be moved between channel inputs when selected using the MOVE FROM button. The Input 1 or 2 field will be highlighted and the PATCH, REMOVE and MOVE FROM buttons will be replaced with MOVE TO, and CANCEL. Upon selection of a new patch point, pressing MOVE TO will move the connection. CANCEL will cancel the operation.

Multiple Patching - It is possible to patch regions of sources.

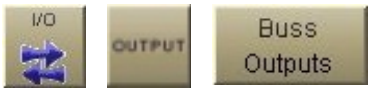
- Select a list of input ports using the trackball by dragging down the column
- Select the fader to start patching to
- Select Patch

(7) Port Isolation
The ISOLATE button allows the selected port connection to be isolated from memory recall, so that its current settings will not be over-written by what is in the memory. Clicking the button a second time will de-isolate the connection. A brown cell in the Label column indicates that a port has been isolated. Other console settings can be isolated using the Isolate screen.

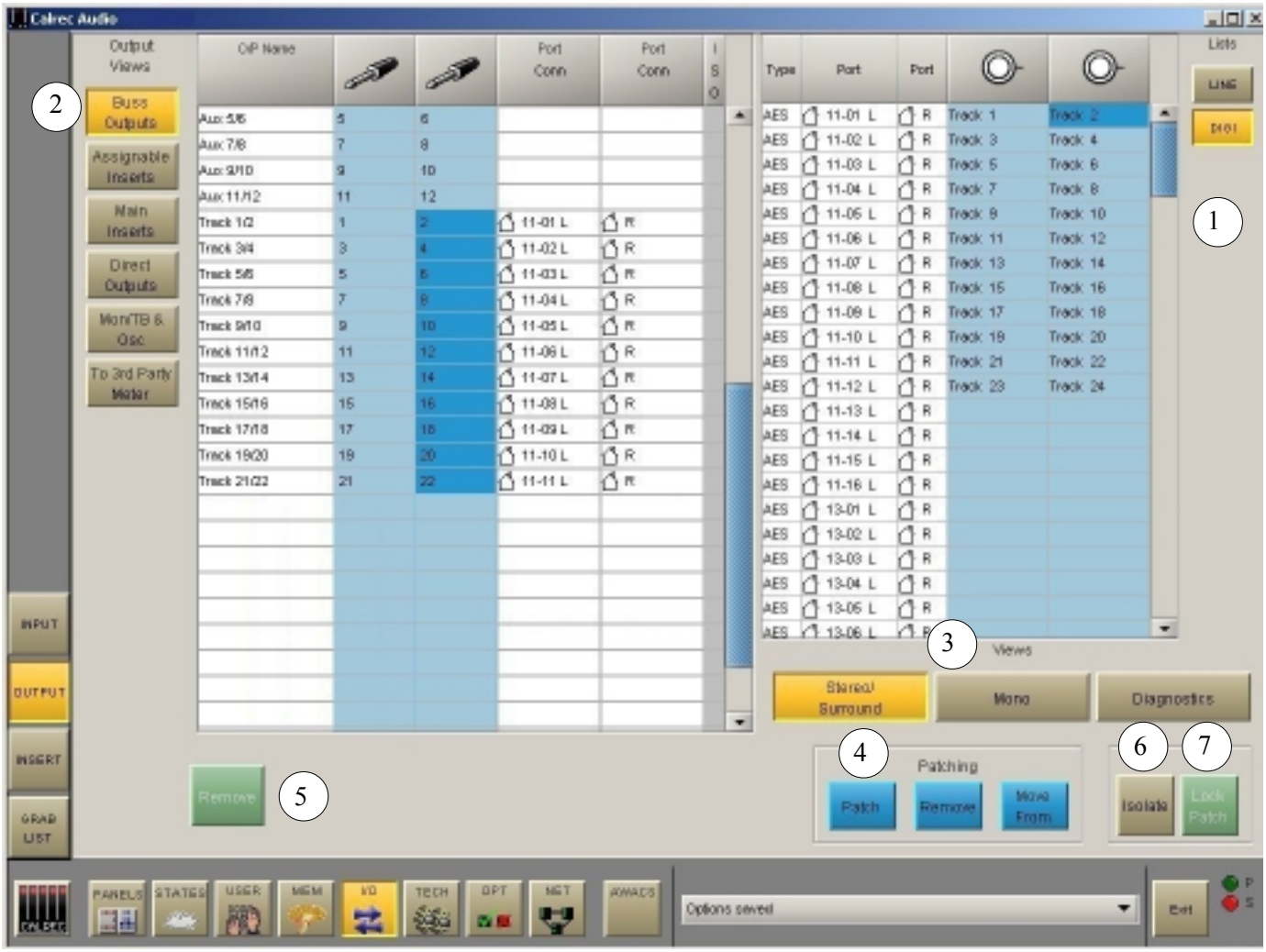
(8) Mic Open Busses
Each input port can be assigned to a MIC OPEN buss, such that if the input is patched to a channel input, it will operate the mic open circuit when that channel is faded up and routed to the programme output. First select the input and then select the required Mic Open Buss button. If a pair of inputs are patched to a stereo channel, the channel will operate the buss to which the left of the pair is assigned. Each buss can be set to automatically cut the studio loudspeaker output (two separately cut outputs are provided, one for each buss) and/or fire a relay. These are set on the OPTIONS screens: TX/REH and GPO.

(9) Grab Ownership (Only visible if Hydra Audio Networking is installed)
When a networked source is patched, ownership of it assigned to the console. In the case where several consoles share sources on the same network, the console that connects to the source first will be given control (ownership) over that source. Other consoles that subsequently connect the same source will not be able to control it. In circumstances when the ownership needs to be over-ridden, the grab buttons allow the console to grab ownership of the network sources, either altogether, individually, or by adding them to a “Grab List”. For more information on Hydra, see the Hydra Technical Sales Brochure.

OUTPUT PORTS SCREEN



The I/O - Output screens allow “Patching” of console output signals to main, auxiliary and track output ports, insert sends and direct outputs. It is also for setting up Monitor, Talkback ,Oscillator and external metering outputs.



(1) Output Port Lists

All of the available ports can be grouped into suitable lists using the Set up application. These lists can then be displayed on the left of this screen, ready to be patched to channels on the right. Different lists are accessed using the selection buttons.

(2) Viewing Options

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

(3) Output Views

These buttons select the different categories of console output signals which can be patched to output ports (e.g. buss outputs, insert sends, direct outputs, monitoring outputs, Talkback outputs, oscillator outputs, external meter outputs). They will then be displayed in the main section of this screen.

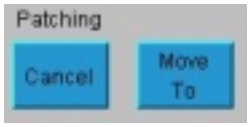
(4) Patching

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. (If groups are set to be mono, only the left output will have a signal on it).

Patches can be removed from output ports when selected using the REMOVE patching button. 

Connections can be moved between output ports when selected using the MOVE FROM button. The Name field will be highlighted and the PATCH, REMOVE and MOVE FROM buttons will be replaced with MOVE TO and CANCEL. Upon selection of a new patch point, pressing MOVE TO will move the connection. CANCEL will cancel the operation.

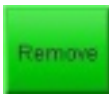


Multiple Patching - It is possible to patch signals to many outputs in one operation:

- Select a list of output signals using the trackball by dragging down the column
- Select an output port to start patching to
- Select Patch

(5) Remove

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. Simply select the port connection from the “Port Conn” column on the list of output signals, and select Remove.



(6) Port Isolation

The ISOLATE button allows the selected port connection to be isolated from memory recall, so that it’s current settings will not be over-written by what is in the memory. Clicking the button a second time will de-isolate the connection. A brown cell in the Label column indicates that a port has been isolated. Other console settings can be isolated using the ISOLATE screen.

(7) Output Port Locking

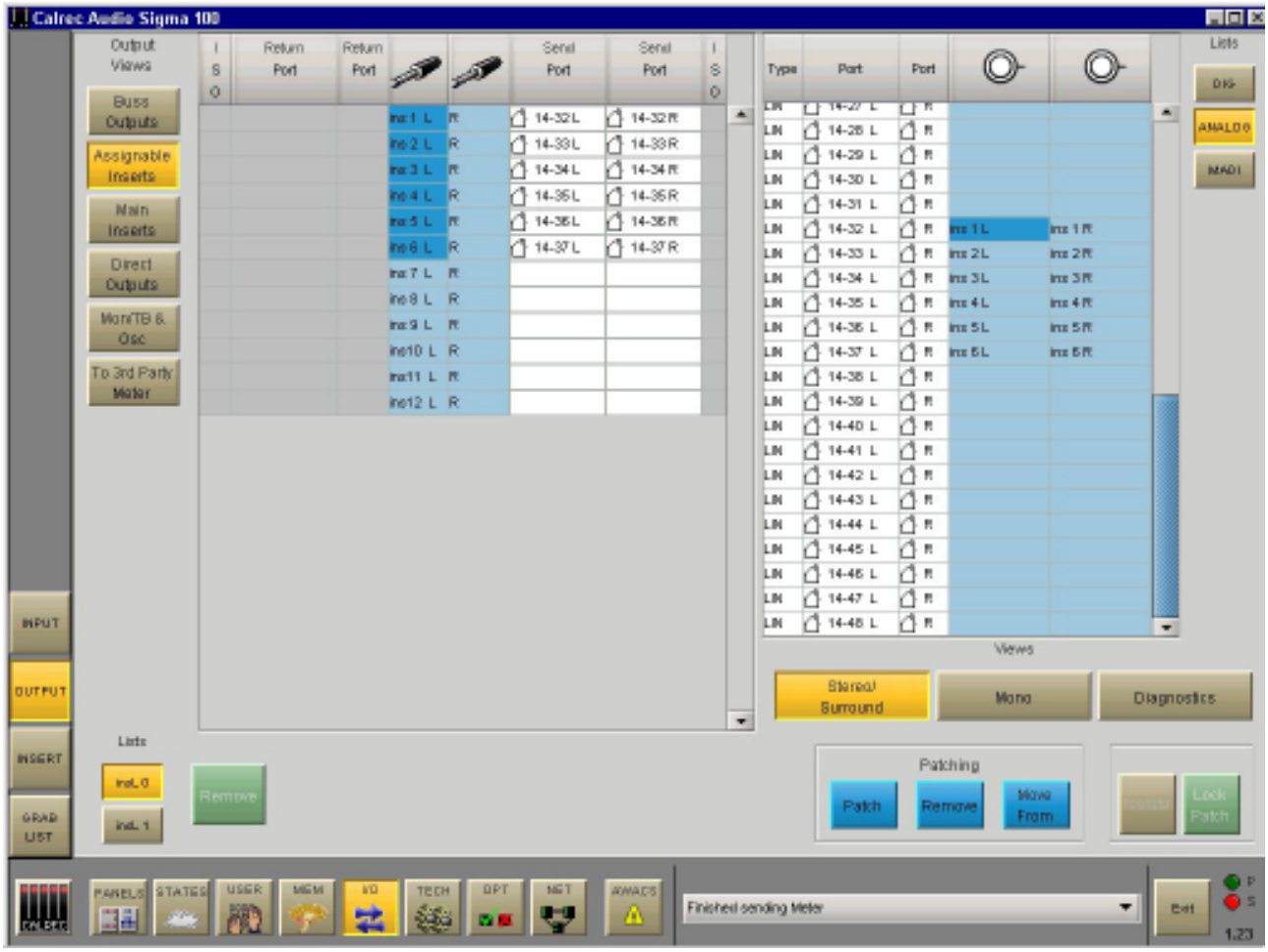
Some output ports may need to be ‘locked’ once they have been set up to avoid accidental removal. For example - a technician may assign the mixing console’s Main 1 output signal to a particular output port. If this were the main studio transmitter output, it would be very undesirable to allow the assignment to be easily changed during normal operation. For this reason, a system of software locks is provided to protect critical parts of each configuration. The console can be in one of three modes, “User”, “Technician” and “Supervisor”. Operation of the locking system is only available in “Technician” or “Supervisor” mode which are password protected to add an extra layer of security. Modes are selected using the TECH - User Mode screen.

To lock an output port assignment, select an output port which has a source assigned to it (click on the green patch point column), and select the Patch LOCK button.

Provided that the desk is in “Technician” mode, the lock state will be toggled. If the lock is active, the port name will be highlighted in bright green text, otherwise the text will be shown in black.

Once a patch has been locked, any attempt to patch over it, move it, or remove it will cause an error dialog box to display “Patch locked!”

ASSIGNABLE INSERT SENDS

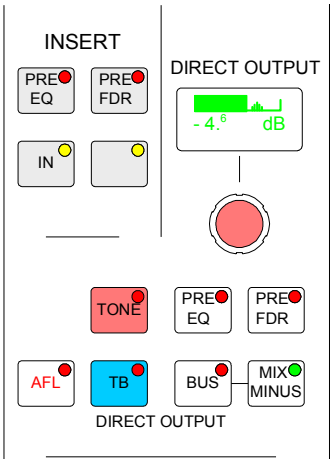


The output ports for assignable insert sends can be patched, moved and removed on the I/O - Output screen, by selecting “Assignable Inserts” from the list of Output Views.

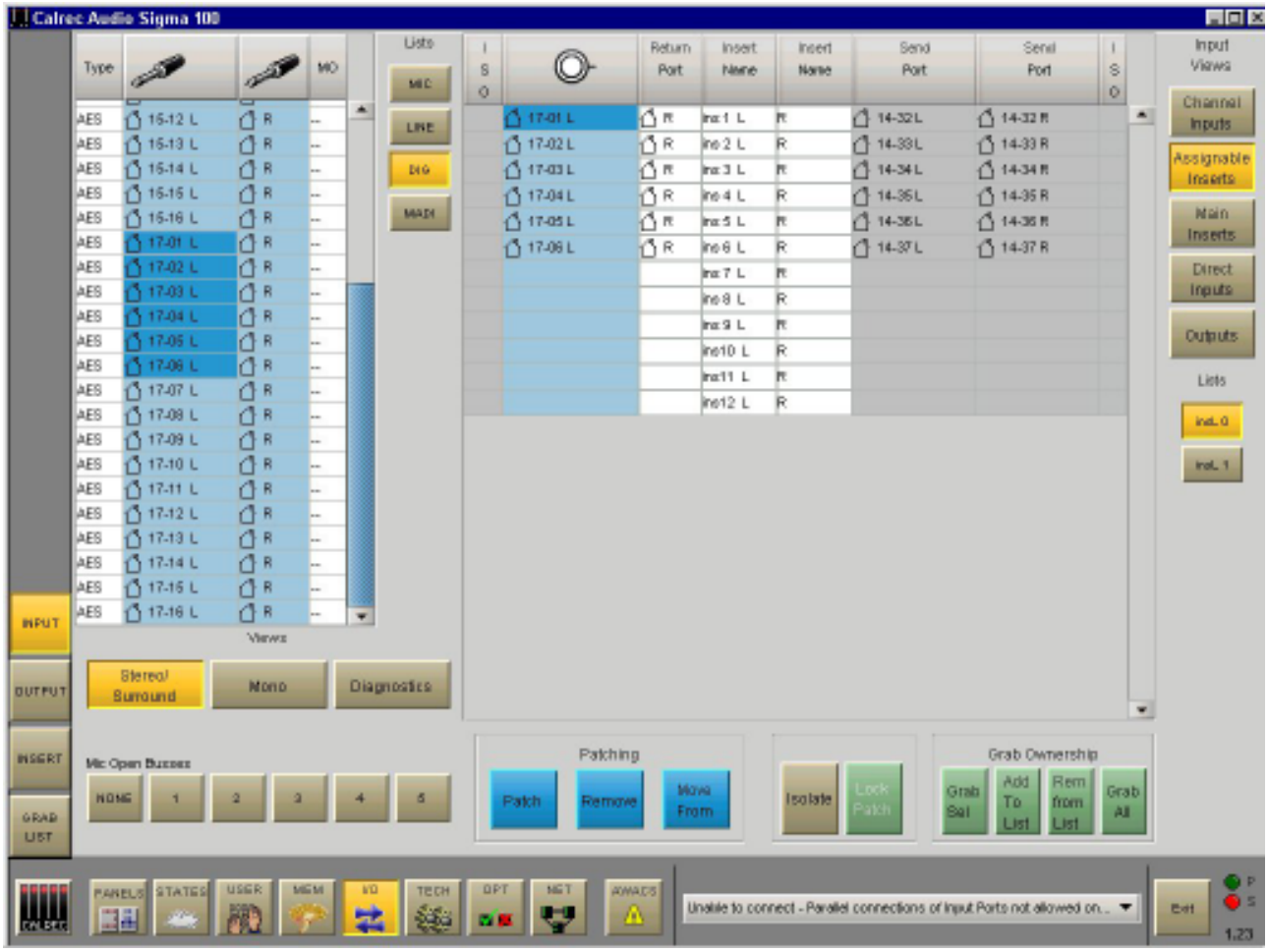
The input ports connected to the insert return can also be seen. These are set up on the I/O - Input screen.

Once this is done the Insert can be patched to any channel or group using the INSERT screen or by using the optional I/O Matrix panel on the console.

Once connected, the Insert is switched into the channel path using the buttons on the Input/Output module.



ASSIGNABLE INSERT RETURNS

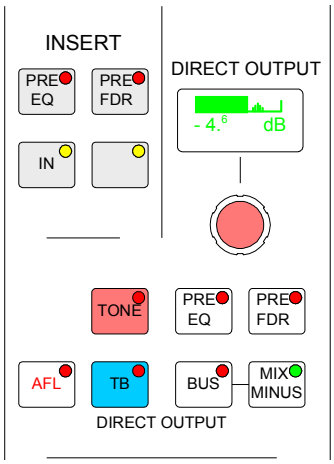


The input sources for assignable insert returns can be patched, moved and removed on the I/O - Input screen, by selecting “Assignable Inserts” from the list of Input Views.

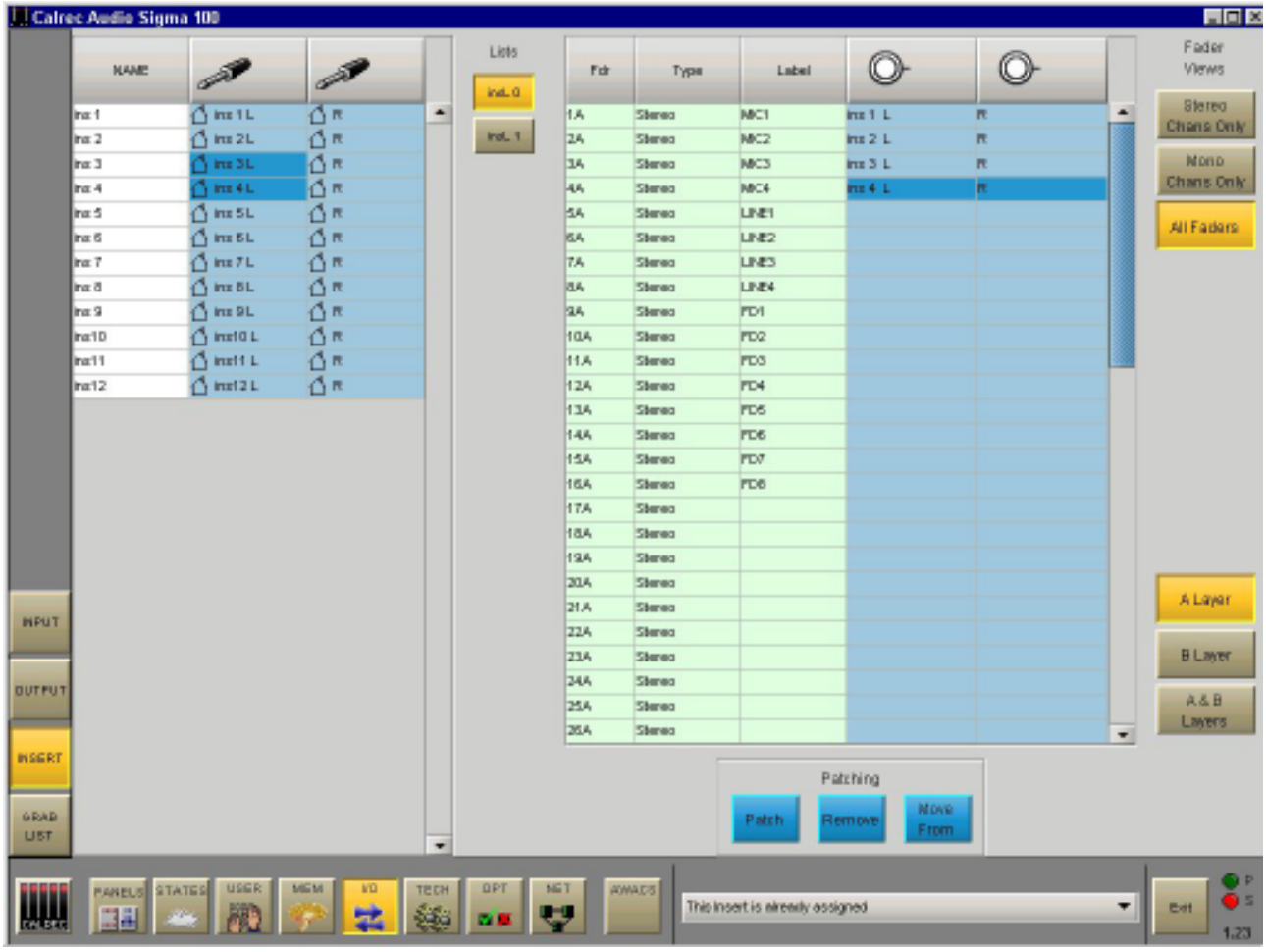
The output ports connected to the insert send can also be seen. These are set up on the I/O - Output screen.

Once this is done inserts can be connected to any channel or group using the INSERT screen or the optional I/O Matrix panel on the console.

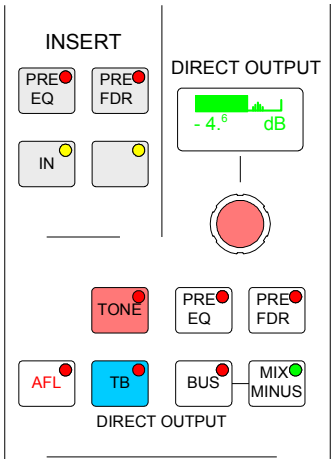
Once connected, the insert is switched into the channel path using the buttons on the Input/Output module.



INSERT SCREEN



Once the Assignable insert sends and returns have been set up on the Input and Output screens, they can be patched to channels and groups, in the same way that channel inputs are patched. The Fader View buttons select which paths are on display.

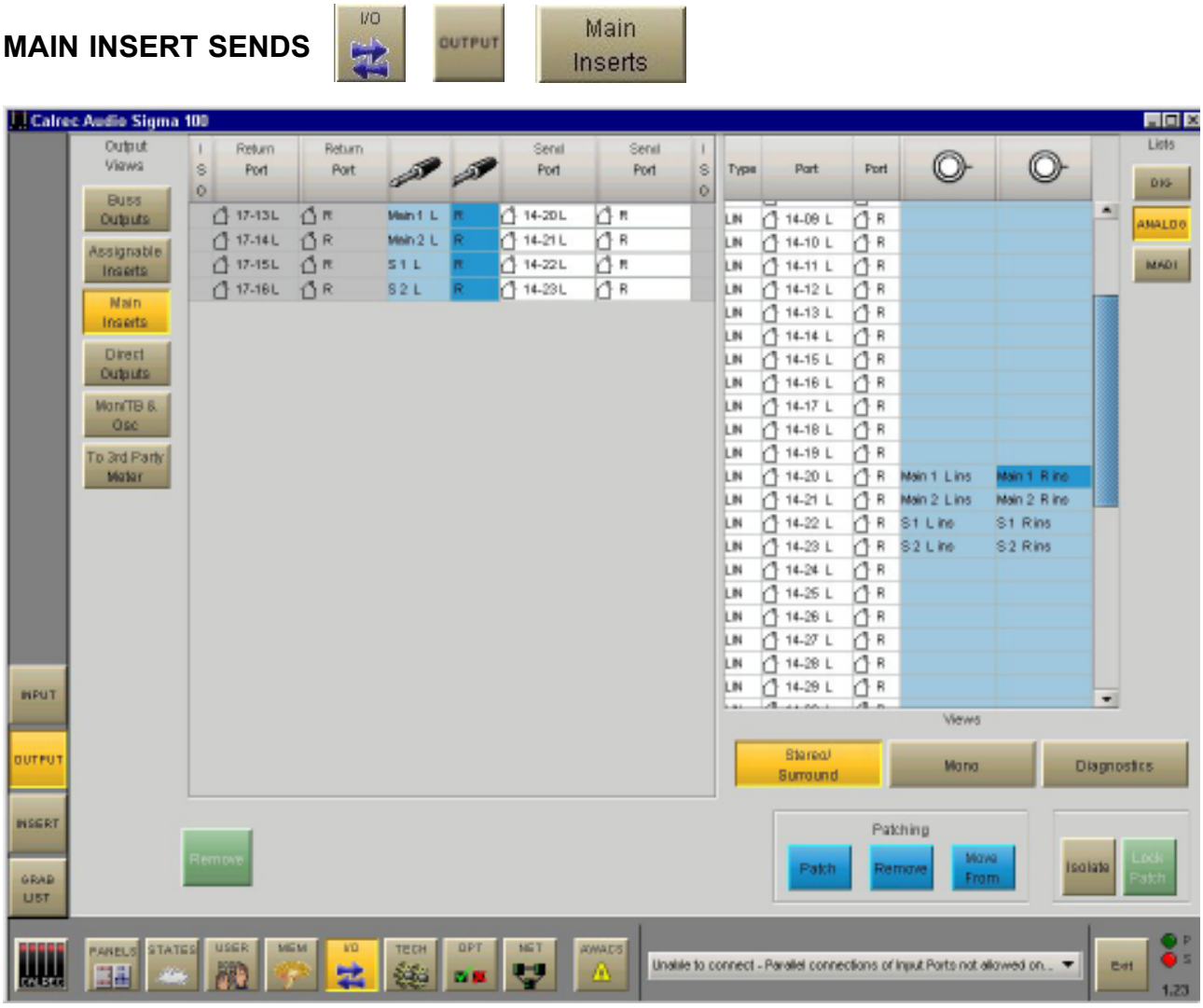


Assignable inserts can also be patched to channels and groups by using the optional I/O Matrix panel on the console. Once connected, the Insert is switched into the channel path using the buttons on the Input/Output module.

All the Inserts are listed on the left hand side of the screen. Most inserts are treated as pairs in the labelling. L and R are used to distinguish the two halves of the pair. This makes it easier for them to be used as a stereo insert but does not necessarily mean they are stereo. The two halves of the pair can be used for separate mono signals.

Note: If groups are set to be mono, only the left insert will have a signal on it.

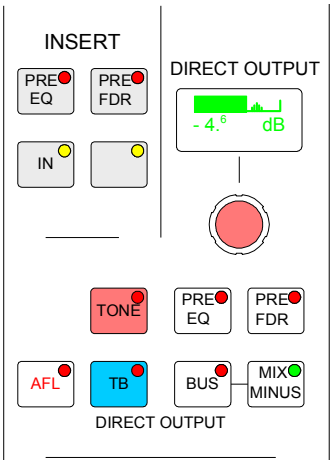
MAIN INSERT SENDS



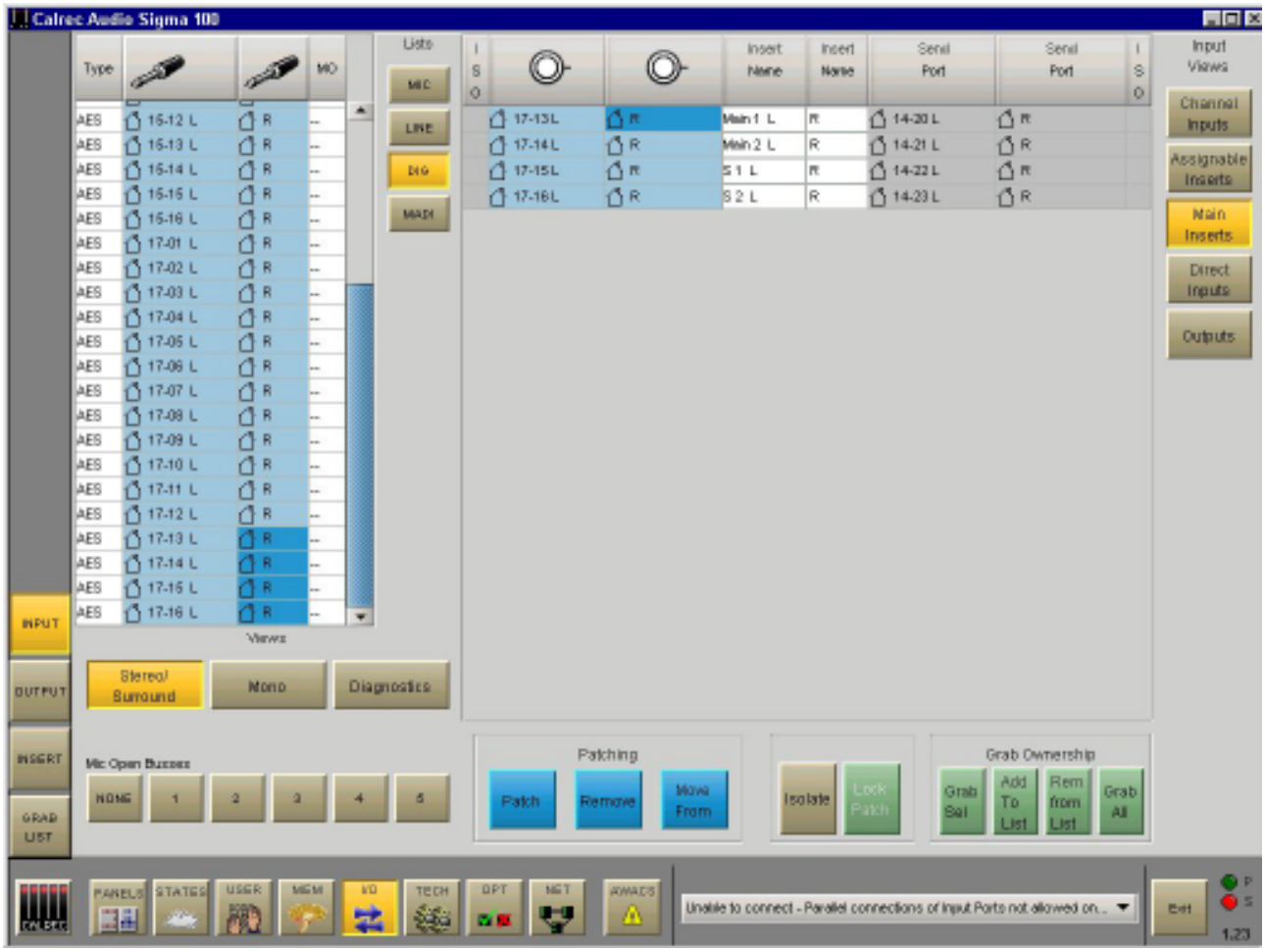
The output ports for main insert sends can be patched, moved and removed on the I/O - Output screen, by selecting “Main Inserts” from the list of output views. The main inserts are dedicated to the main outputs.

The input ports connected to the main insert return can also be seen on this screen. These are set up on the I/O - Input screen.

Once the ports have been set up the insert can be switched into the main path using the buttons on the Input/Output module.



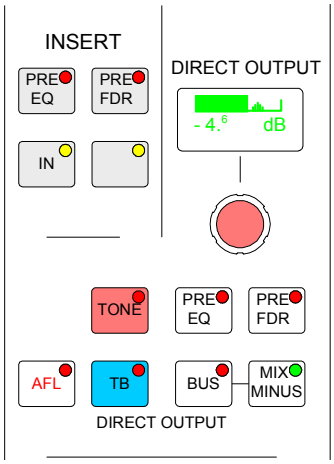
MAIN INSERT RETURNS



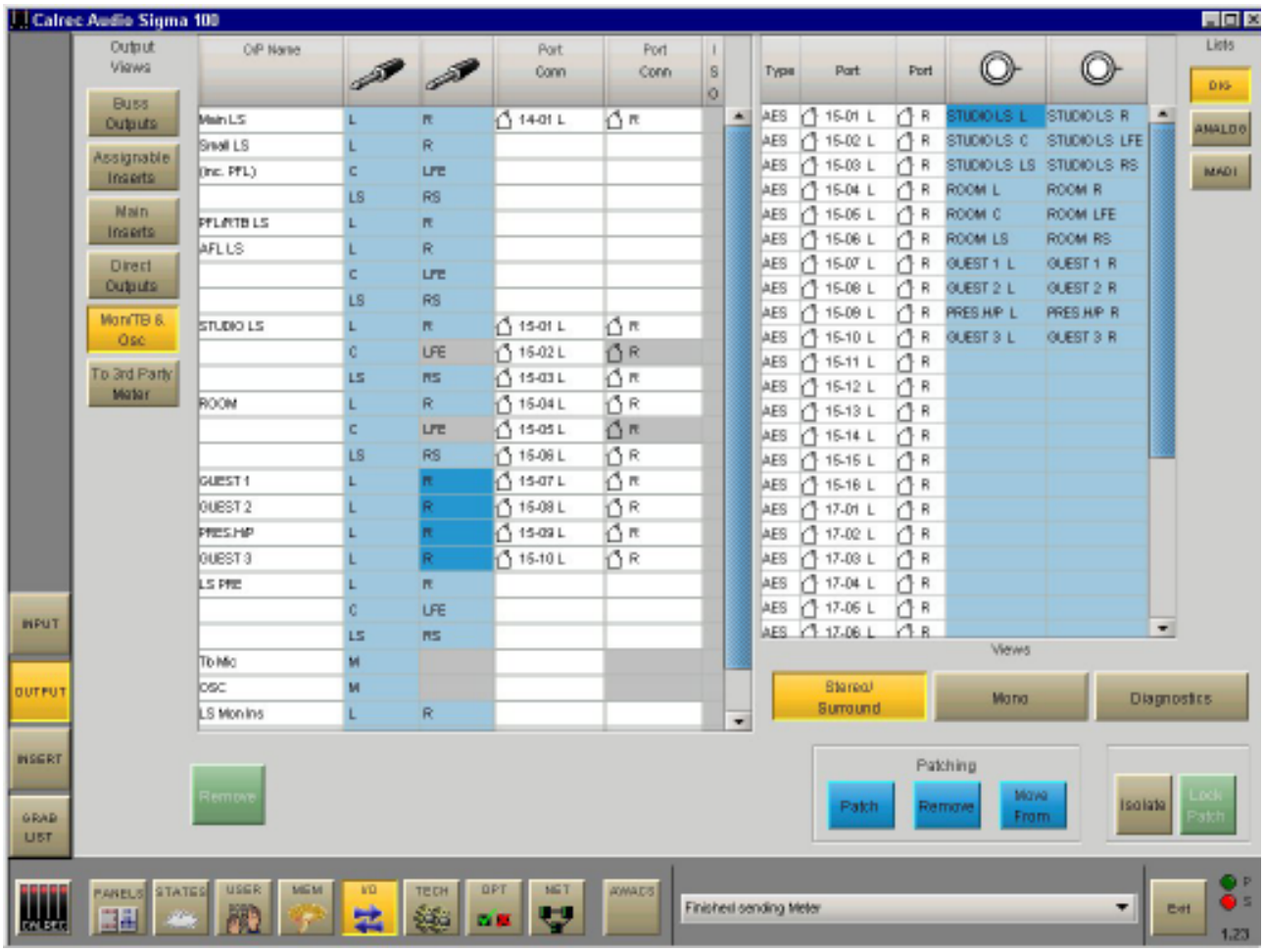
The input sources for Main insert returns can be patched, moved and removed on the I/O - Input screen, by selecting “Main Inserts” from the list of input views.

The output ports connected to the insert send can also be seen. These are set up on the I/O - Output screen.

The main inserts are dedicated to the main outputs. Once the ports have been set up the insert can be switched into the Main path using the buttons on the Input/Output panel.



MONITORING, TALKBACK AND OSCILLATOR OUTPUTS

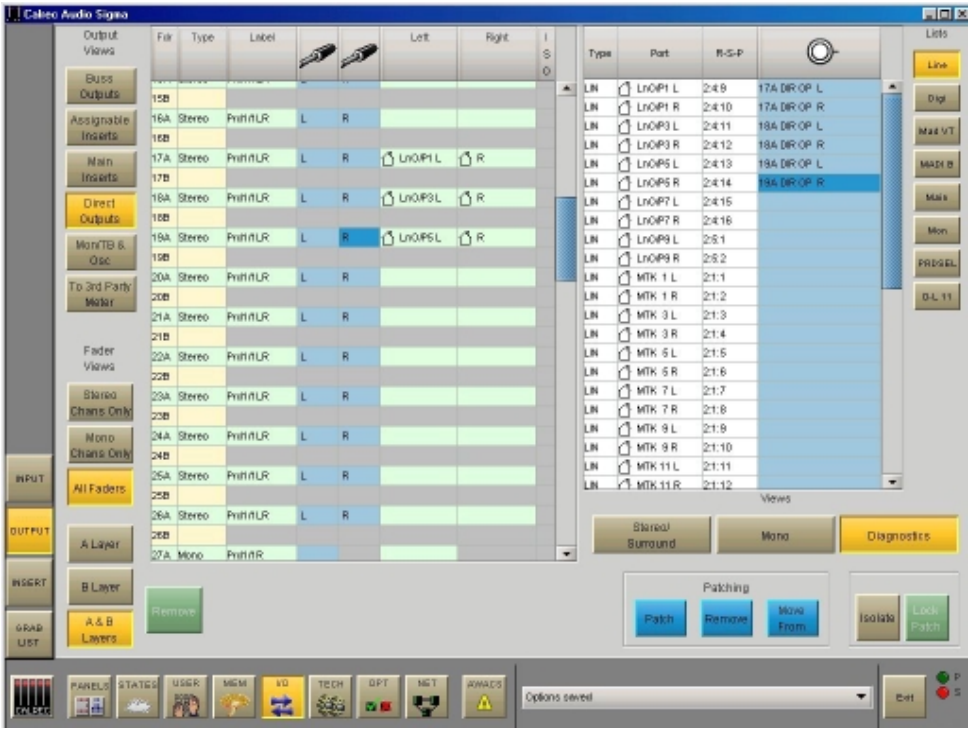


The output ports for the monitoring, talkback and oscillator outputs can be patched on the I/O - Output screen, by selecting “Mon/TB & Osc” from the list of Output Views.

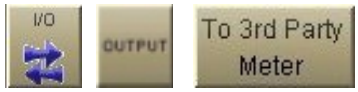
The send ports for the LS monitor insert are patched on this screen. The return ports are patched on the Options - Mon I/P & TB - Mon Sel (EXT I/P) screen.

DIRECT OUTPUTS

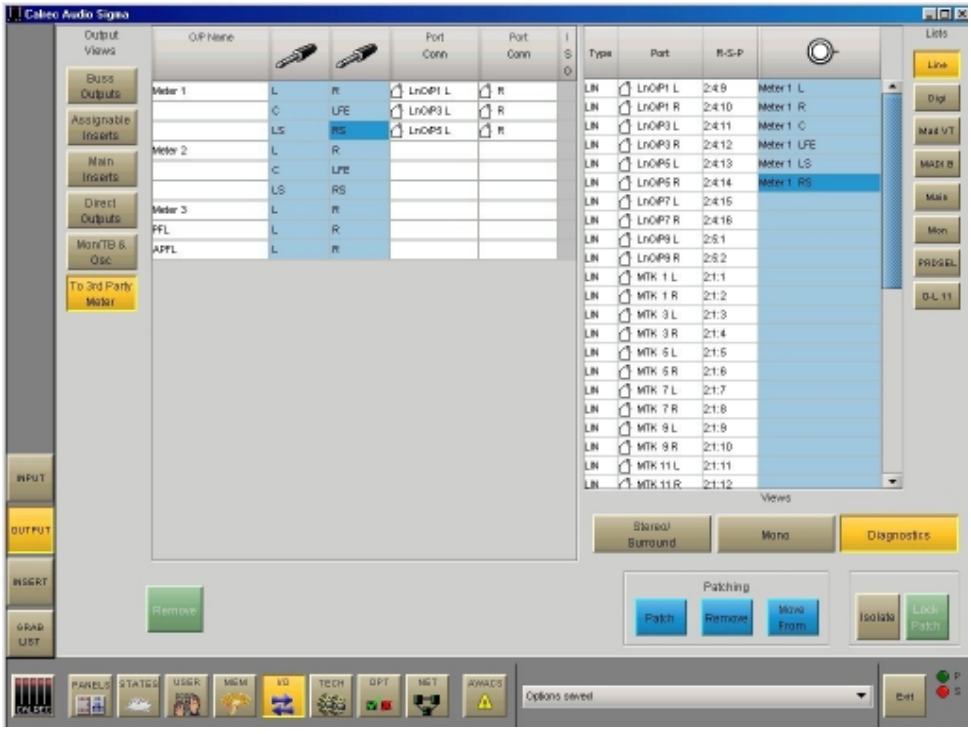
The output ports for the Direct Outputs can be patched on the I/O - Output screen, by selecting “Direct Outputs” from the list of Output Views.



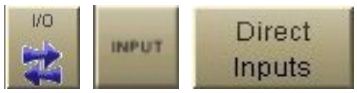
3RD PARTY METER



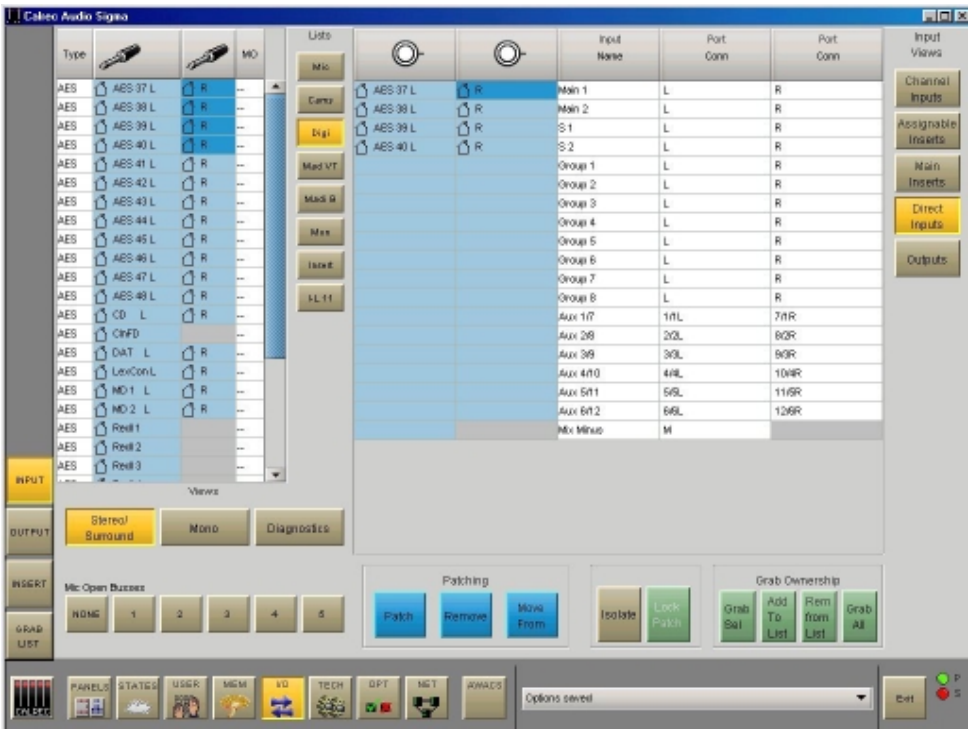
The output ports for the External Meters, such as a DK phase scope, can be patched on the I/O - Output screen, by selecting “To 3rd Party Meter” from the list of Output Views. Most of the meters on the console are driven internally and do not require output ports.



DIRECT INPUTS

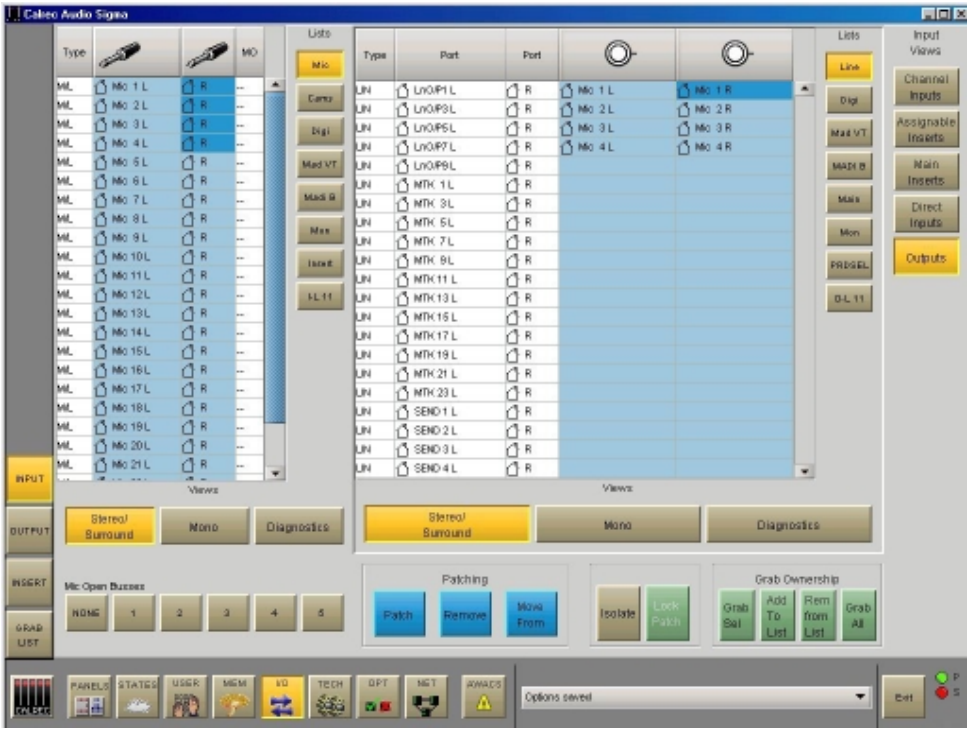


Input ports can be patched to Direct inputs on the I/O - Input screen, by selecting “Direct Inputs” from the list of Input Views.

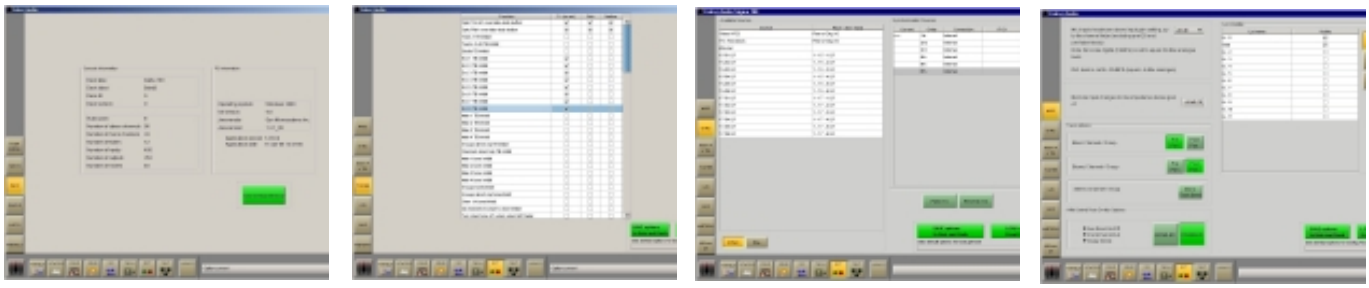


INPUTS TO OUTPUTS

Input ports can be patched directly to output ports on the I/O - Input screen, by selecting “Outputs” from the list of Input Views.



Engineering Information



TECH SCREENS

The TECH screens are for the studio technician and Calrec Support Engineers to diagnose problems, access system information such as lists and rack card configuration, save the default studio memory and enter password protected modes.

The Tech-User Mode screen allows the studio technician to enter the password protected "Technician" or "Supervisor" Modes allowing him or her to operate critical parts of the system, and set up passwords for other "Technicians" or "Supervisors".

The Tech-MSGS screen reports messages, which form a history which can be used by Calrec engineers to diagnose any problems which may arise.

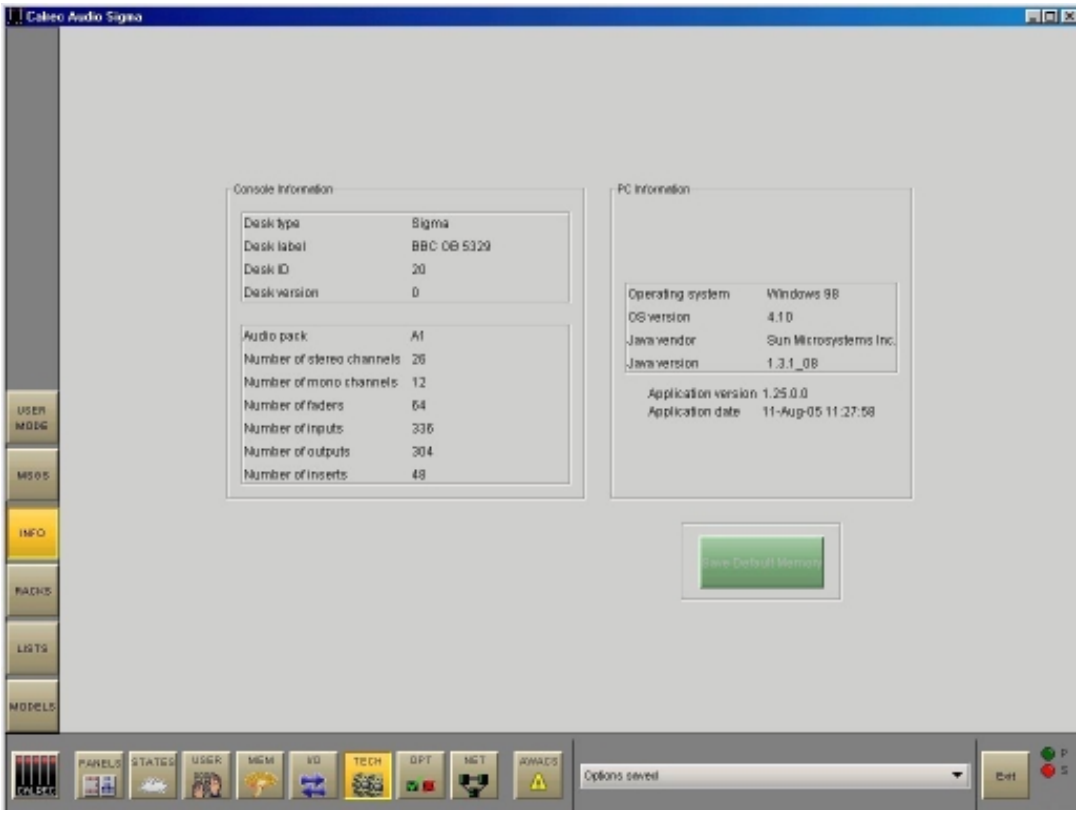
The Tech-Info screen (shown below) displays system information and allows the Default Memory to be saved.

The Tech-Racks screen gives details of the systems rack configuration.

The Tech-Lists screen shows the contents of the lists of inputs, Outputs and Inserts which are available on the I/O Matrix and I/O screens. These will have been set up during installation.

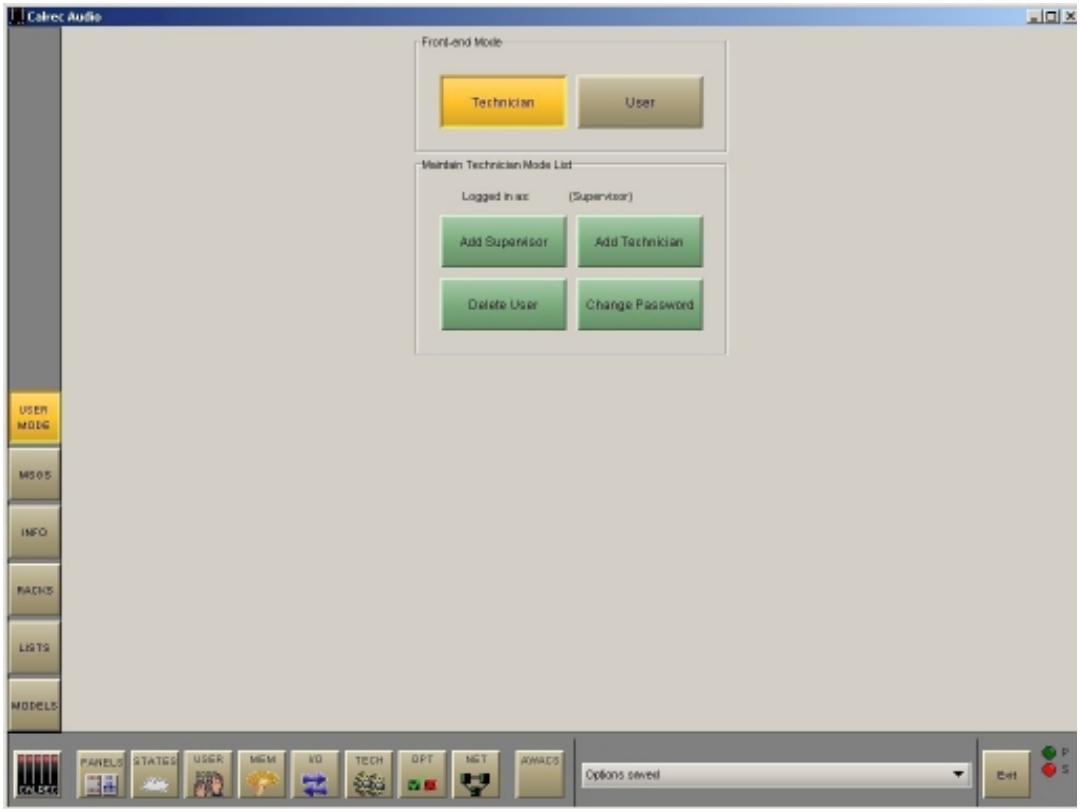
The Tech-Models screen shows fader and path models for the system.

Info Screen and Default Memory



The Default Memory will usually be created upon installation of the console using the Save button on this screen. The default memory 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. It is recalled using the Default Set Up button on the control surface.

Tech - User Mode



The console can be in one of three modes, “User”, “Technician” and “Supervisor”. Operation of certain screen functions is only available in “Technician” or “Supervisor” mode. These modes are password protected to add an extra layer of security. The TECH-USER MODE screen is used to log in and out of different modes, and manage usernames and passwords for the different types of user.

It is intended that all set-up procedures and configuration may be carried out and maintained by an engineer or technical operator. Technician mode allows unrestricted access to all features of the system, permitting an authorised engineer to prepare the console for use. User mode restricts access to certain screen functions, to prevent accidental changes being made. Supervisor mode allows management of usernames and passwords for technicians and users.

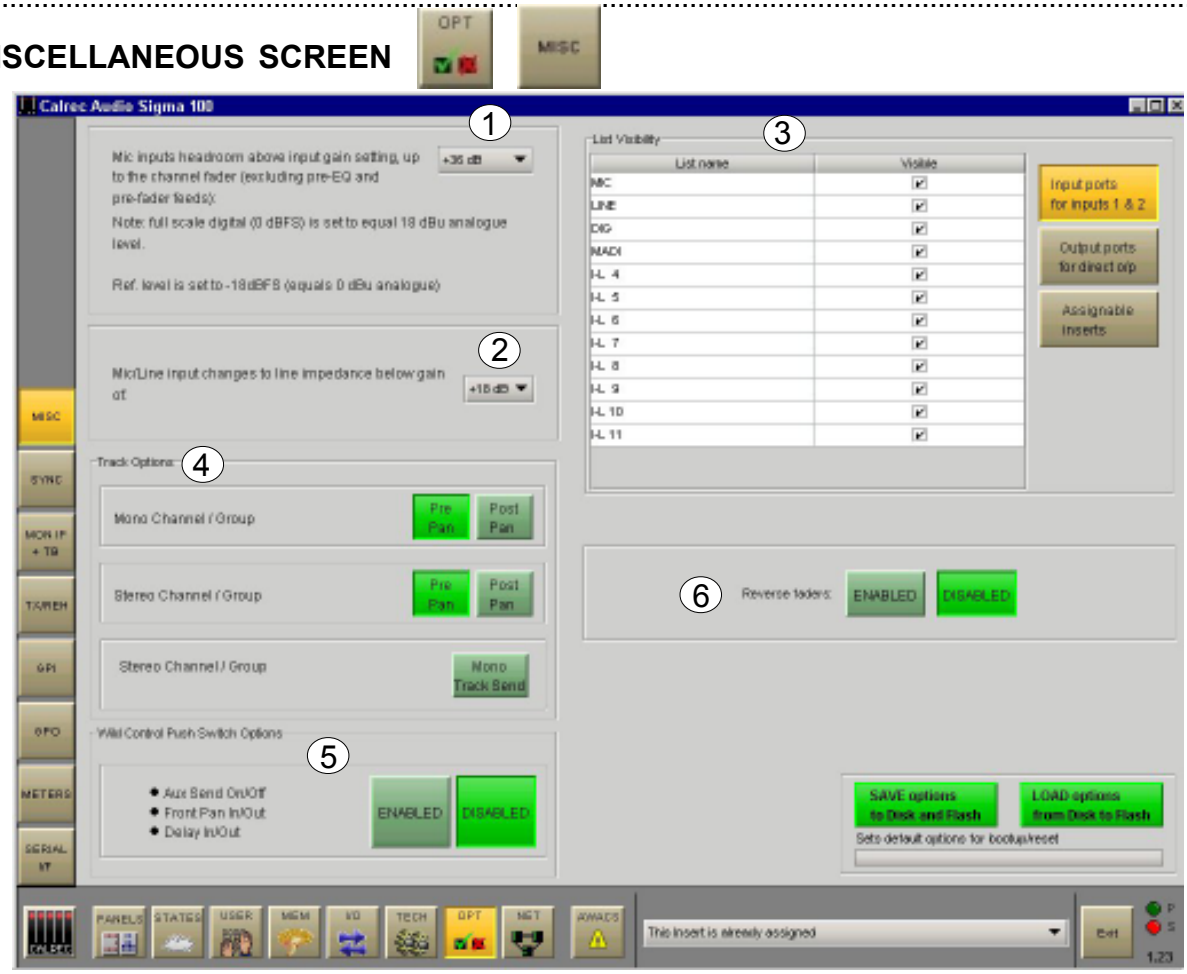
When the system is in Technician or Supervisor mode, the TECH icon at the bottom of the screen will flash.

Usernames and Passwords

The PC will initially be set up with two sets of usernames and passwords:

Username	Password	Description
CalrecAudio	(None)	This user can install and run programs, but not change PC hardware settings, (i.e. set-up network, install drivers). This user is intended to be used during normal operation of the PC.
CalrecAudioAdmin	calrec	This user has full rights to the PC, and can install and change PC hardware settings. This user is intended for use during re-configuration of the PC and to set up Hydra Audio Networking.

MISCELLANEOUS SCREEN



(1) Microphone Input Headroom

The headroom available above the input gain setting, up to the channel fader can be selected here. If for example, the input gain is 40 dB and the mic input headroom is set to 36 dB, then the channel will handle up to -4 dB up to the fader, which can be backed off to avoid clipping of the programme output. Any pre-fader insert or pre-fader feeds to auxes, tracks, or direct outputs will not handle this level and so these should not be used where this headroom is needed. Selecting a high headroom value will compromise the noise spec slightly, but in practise should not be noticeable.

(2) Mic/Line Input Impedance

The point at which the Mic/Line input Impedance changes can be set here.

(3) I/O Matrix Panel List Visibility (Only visible if optional I/O Matrix Panel is fitted)

The user can set which port and insert lists can be accessed on the optional I/O Matrix panel. If for example, output ports which are only used for Buss outputs or Monitoring outputs are assigned to their own lists in the Setup application, those lists could be made invisible to the direct output ports selection on the I/O Matrix panel. All lists are always available on the I/O screens.

(4) Track Options

Global options can be set for how channels and groups feed the track routing selector. They can be pre or post the channel or group pan, and stereo channels and groups can be sent as mono.

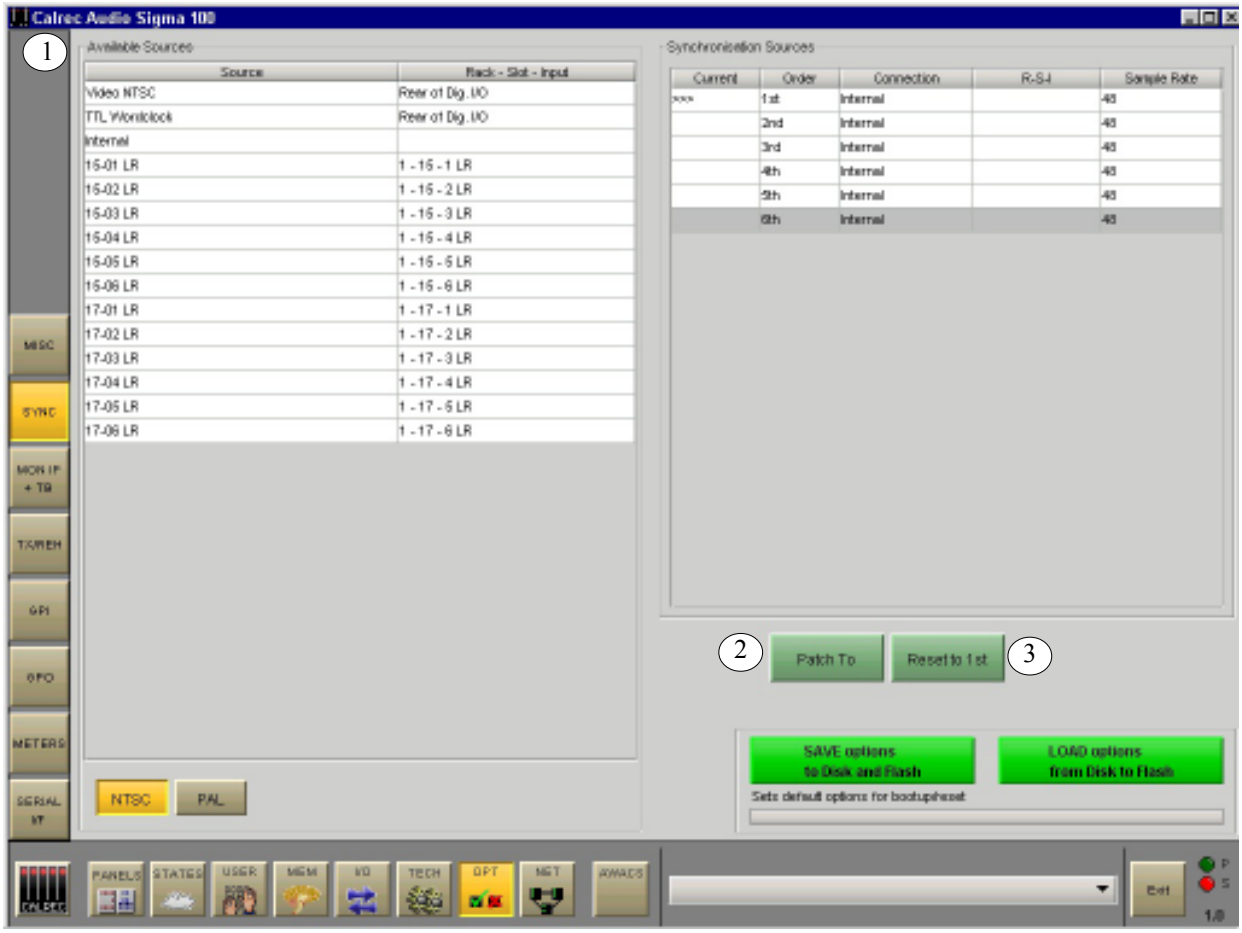
(5) Wild Control Push-Switch Option

If the Aux Send or Front Pan controls are assigned to a wild control, their ON/OFF or IN/OUT status can be controlled using the wild control push-switch. This feature is enabled or disabled here.

(6) Reverse Faders (Optional)

The console's faders can be set to work in reverse, using the enable button.

SYNCHRONISATION SCREEN



(1) Available Sources

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. One of the external sources can be Video, (PAL or NTSC). TTL wordclock is another possible external source.

AES inputs on the console can also be used as an external source. Please note that the facility for locking to external AES sources is restricted to the first six inputs of each AES card in the console. When using an AES input or wordclock as a source, the system will tolerate a variation of up to +/- 100 Hz in the frequency of the source.

(2) Assigning Synchronisation Sources

Synchronisation sources are assigned by selecting an available source from the list on the left side of the screen, then selecting one of the five places in the priority list on the right side of the screen, and selecting Patch To.

(3) Reset to 1st

If the system is running on any of the selections 2 to 6, because the lower numbered ones have failed, and the 1st source is repaired, the system can be RESET TO 1ST during any convenient off-air period.

MONITOR LS SET UP

This screen is used to allocate monitor sources to the user-definable buttons on the trafitional style Monitor LS 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.

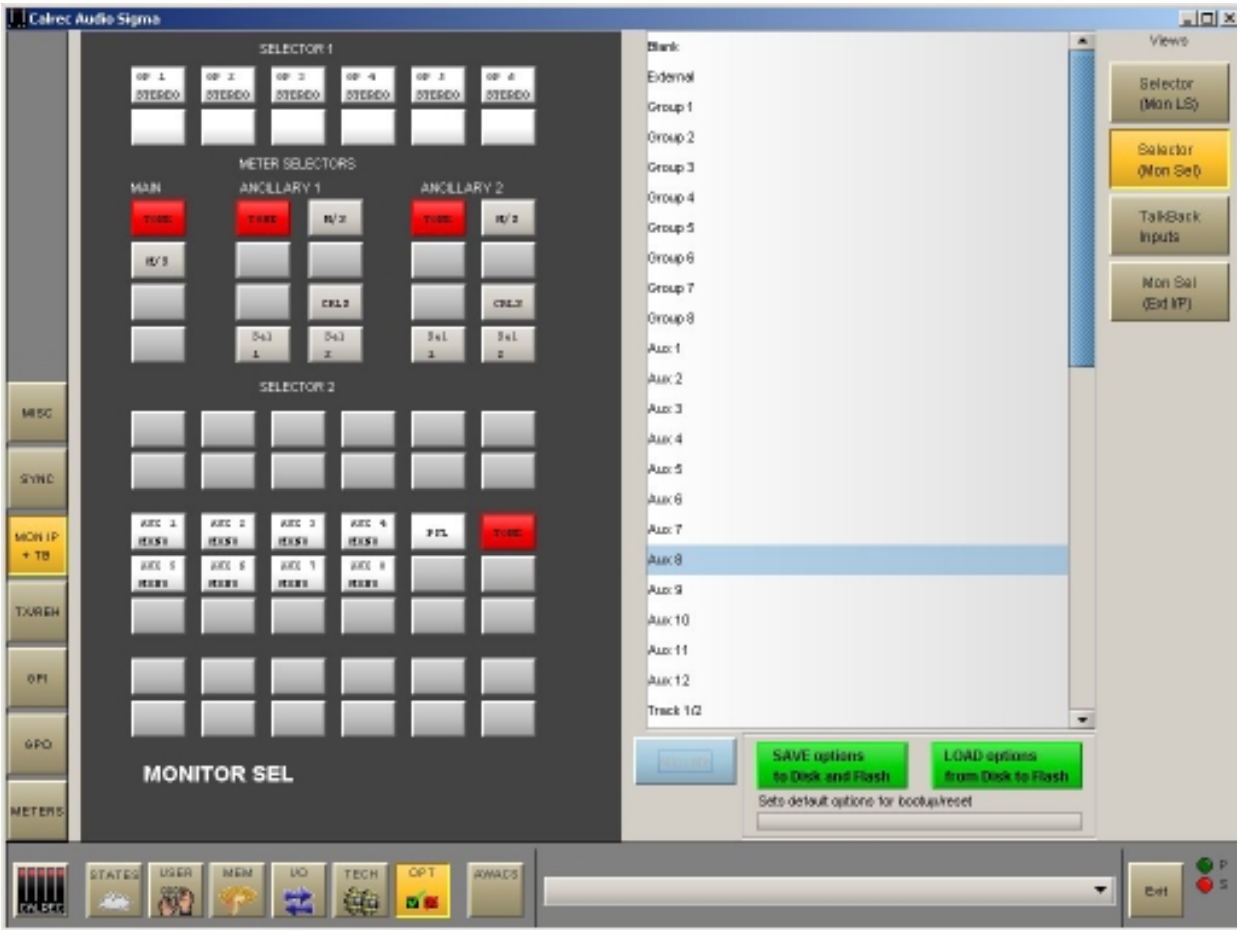
The screen shows a representation of the monitor LS panel. The right side of the screen lists all the available monitor sources. Monitor sources are allocated to the assignable selection buttons as follows:

- 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 screen button, and to choose whether the source is mono, stereo or surround.

To clear any button of its assignment, simply allocate “Blank” from the list as a source.

If your console uses the optional assignable monitor panels, their control screens will be slightly different. Please refer to the Assignable Monitor Panels section for details of their set up.

MONITOR SELECTOR SET UP



This screen is used to allocate monitor sources to the user-definable selection buttons on the traditional style Monitor Selector 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.

The screen shows a representation of the Monitor Selector panel. The right side of the screen lists all the available monitor sources. Monitor sources are allocated to the assignable selection buttons as follows:

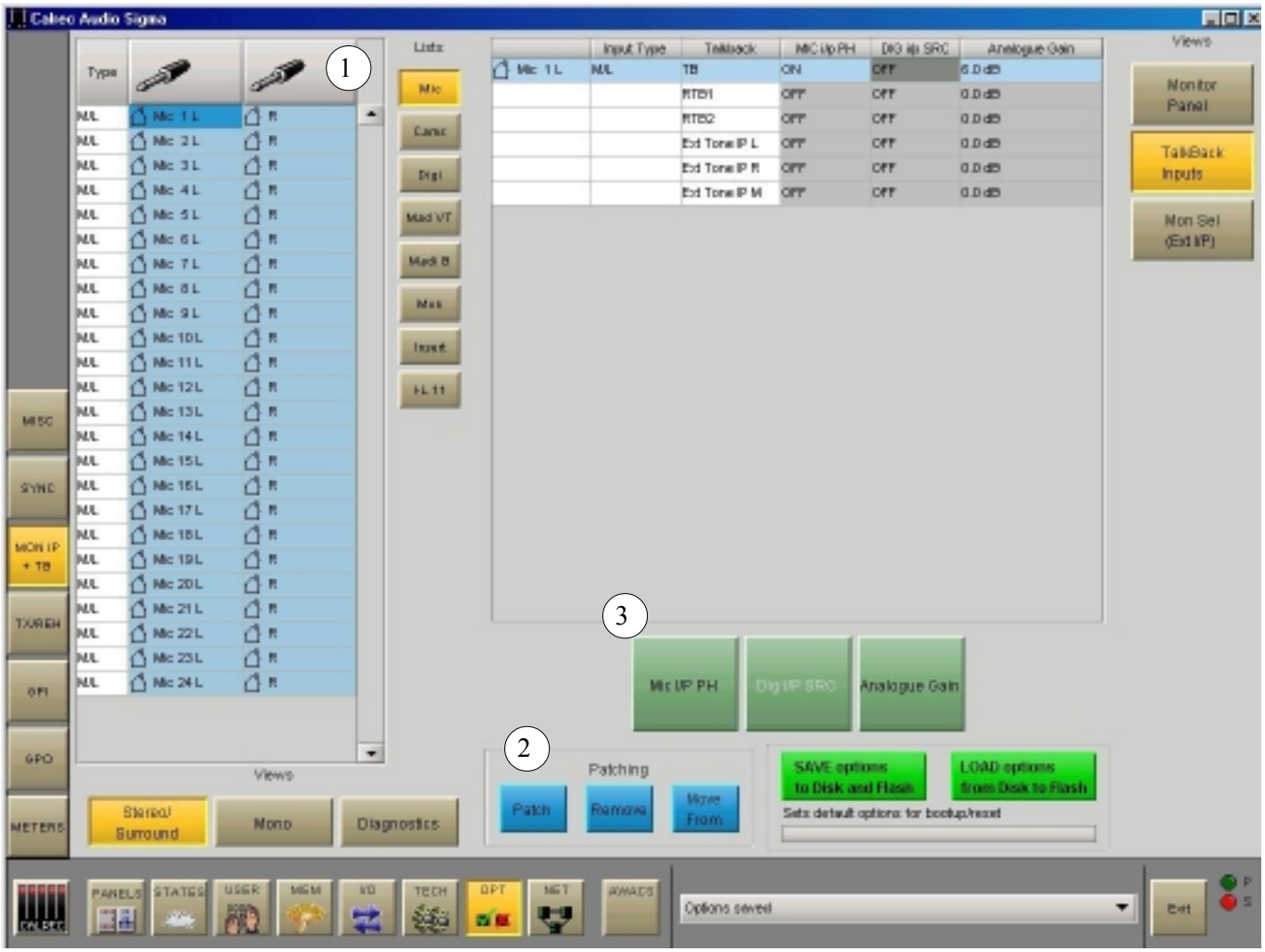
- Select the button to which you want to assign a source (screen button will flash)
- Select the required monitor soure from the list
- Select “Allocate” 

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

To clear any button of its assignment, simply allocate “Blank” from the list as a source.

If your console uses the optional assignable monitor panels, their control screens will be slightly different. Please refer to the Assignable Monitor Panels section for details of their set up.

TALKBACK INPUTS



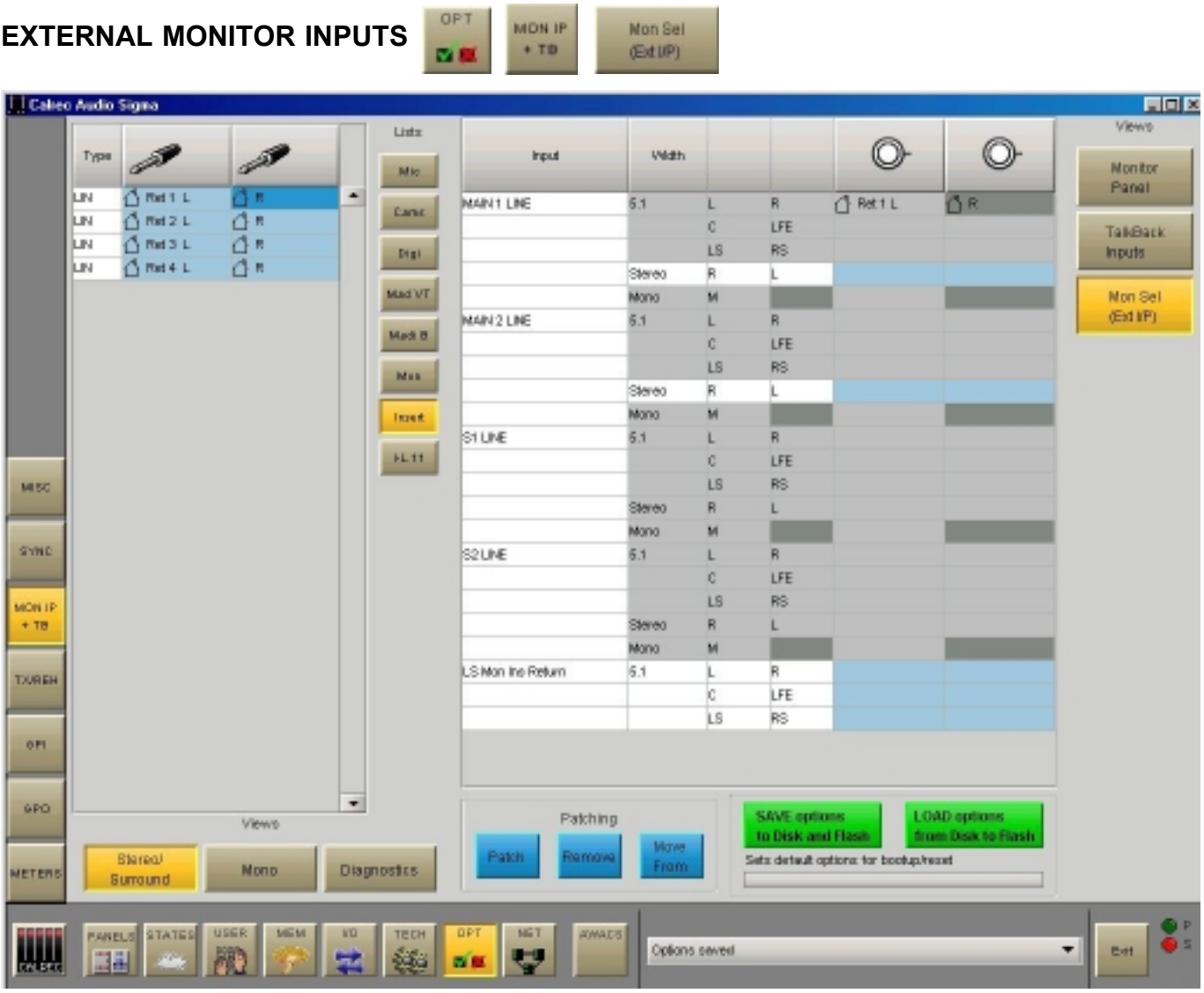
The input sources for Talkback and Reverse Talkback are patched here.

(1) Source Lists
Talkback input ports can be any kind of port, selected from the list on the left of the screen. Different lists are accessed using the selection buttons.

(2) Patching
The Talkback inputs are listed in the main section of the screen. Assignment is made by selecting a source and a Talkback input, and selecting Patch.

(3) Parameters
The parameter buttons provide controls for analogue gain control (coarse), Phantom Power (mic/line) and SRC switching for the input (AES). When selecting analogue gain, a box will appear where the gain can be selected. Selecting Mic i/p PH will turn phantom power on for mic/line inputs. Dig I/P SRC will switch SRC on for AES inputs.

EXTERNAL MONITOR INPUTS

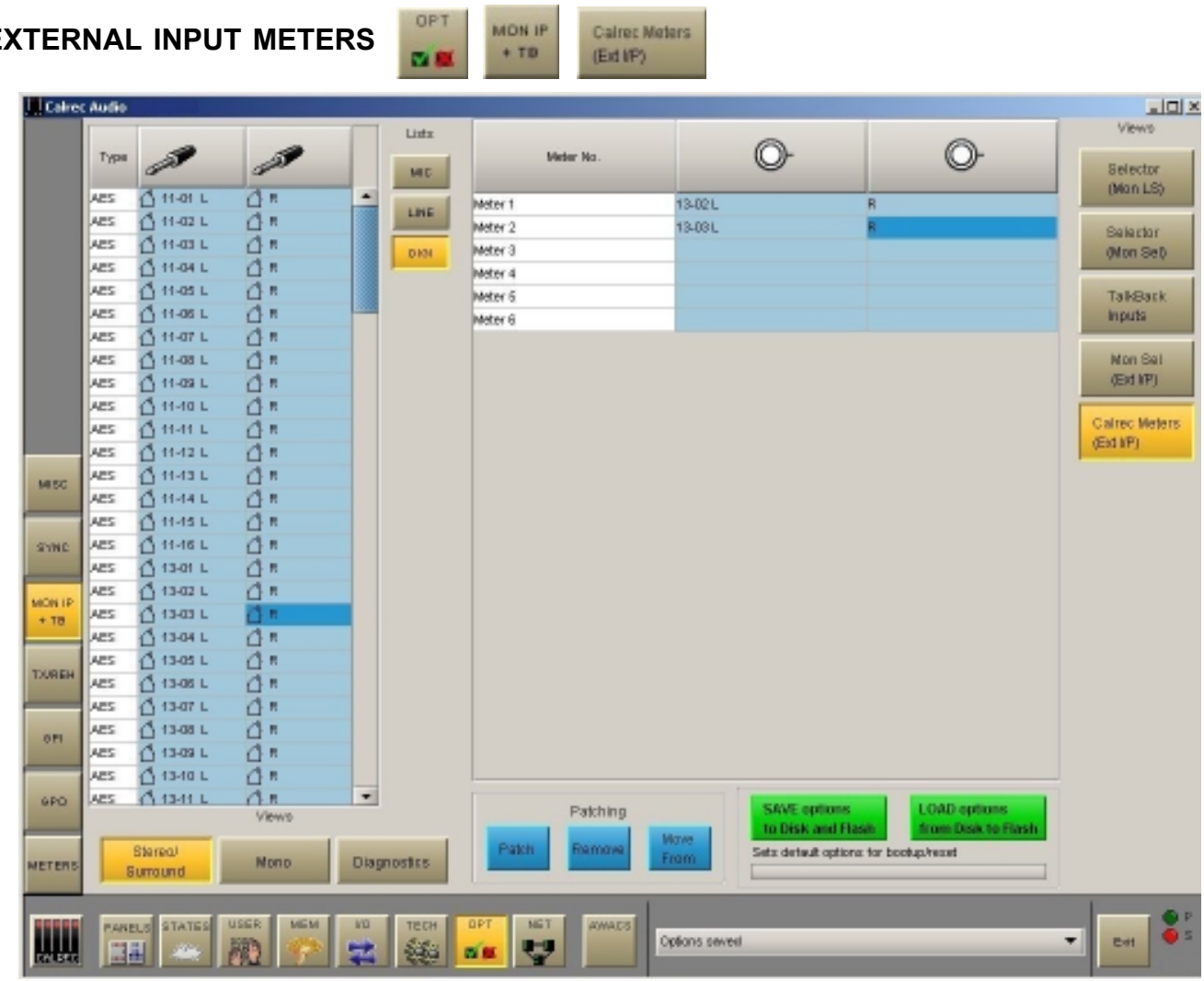


The input sources for External Monitor Inputs can be patched here in the same way that channel inputs are patched. Return ports for the LS monitor insert are patched here also. The send ports are patched on the I/O - Outputs - Mon TB & Osc Screen.

The main line monitor inputs are applicable when the main line output monitor is set to be returned into the desk via an external distribution. Otherwise, the main line monitor points are taken from the main outputs within the desk, before they have passed though the output ports.

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

EXTERNAL INPUT METERS

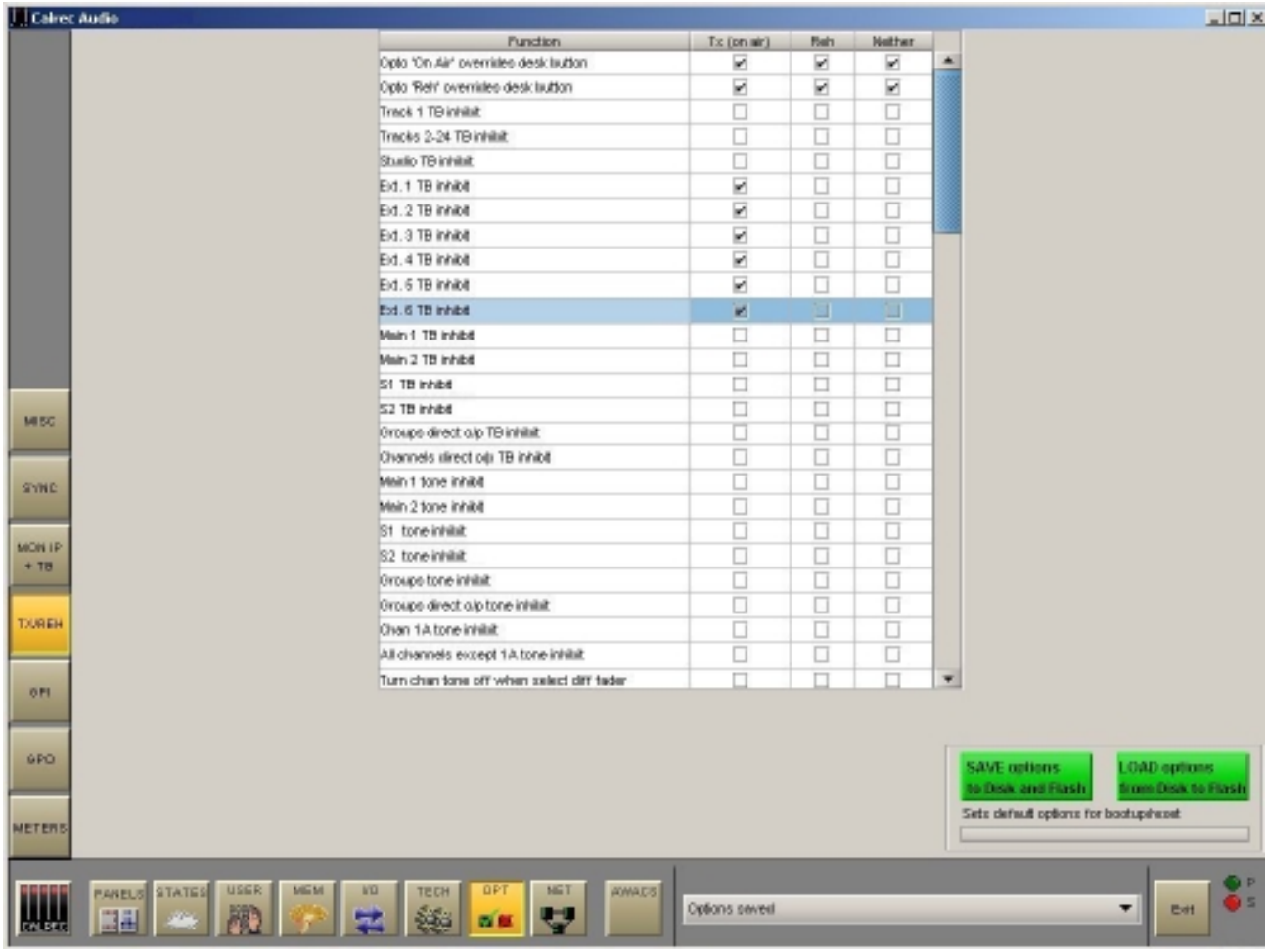


The input sources for external input meters can be patched here in the same way that channel inputs are patched. Up to 6 external input sources can be metered.

External input ports are selected from the available lists on the left of the screen. Different lists are accessed using the selection buttons. The sources can be viewed as pairs (for patching to stereo or surround paths), individual (for patching to mono paths), or individual with the actual rack number, card slot and input shown (for diagnostic purposes).

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

CONDITION SWITCHING (TX/REH) SCREEN



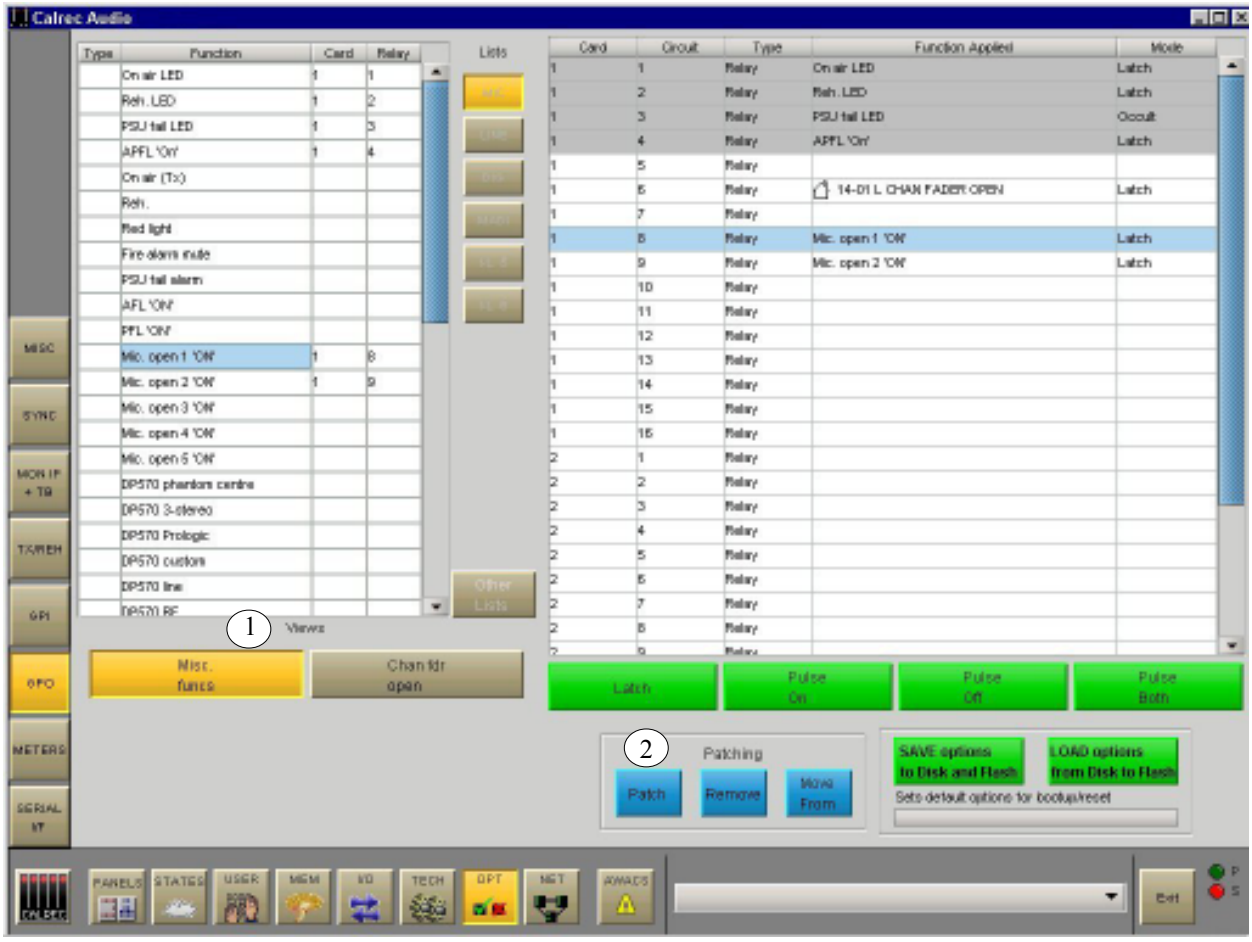
This screen allows the condition switching for the system to be set up.

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 on the console or from external inputs set up on the GPI screen.

Each function can be set to be active, or not, in any of the three states (except for the “On Air” and “Reh” optos which can only override the desk buttons or not).

The functions provided are to cater for different requirements. Therefore some combinations of settings will seem invalid.

GENERAL PURPOSE OUTPUTS SCREEN



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

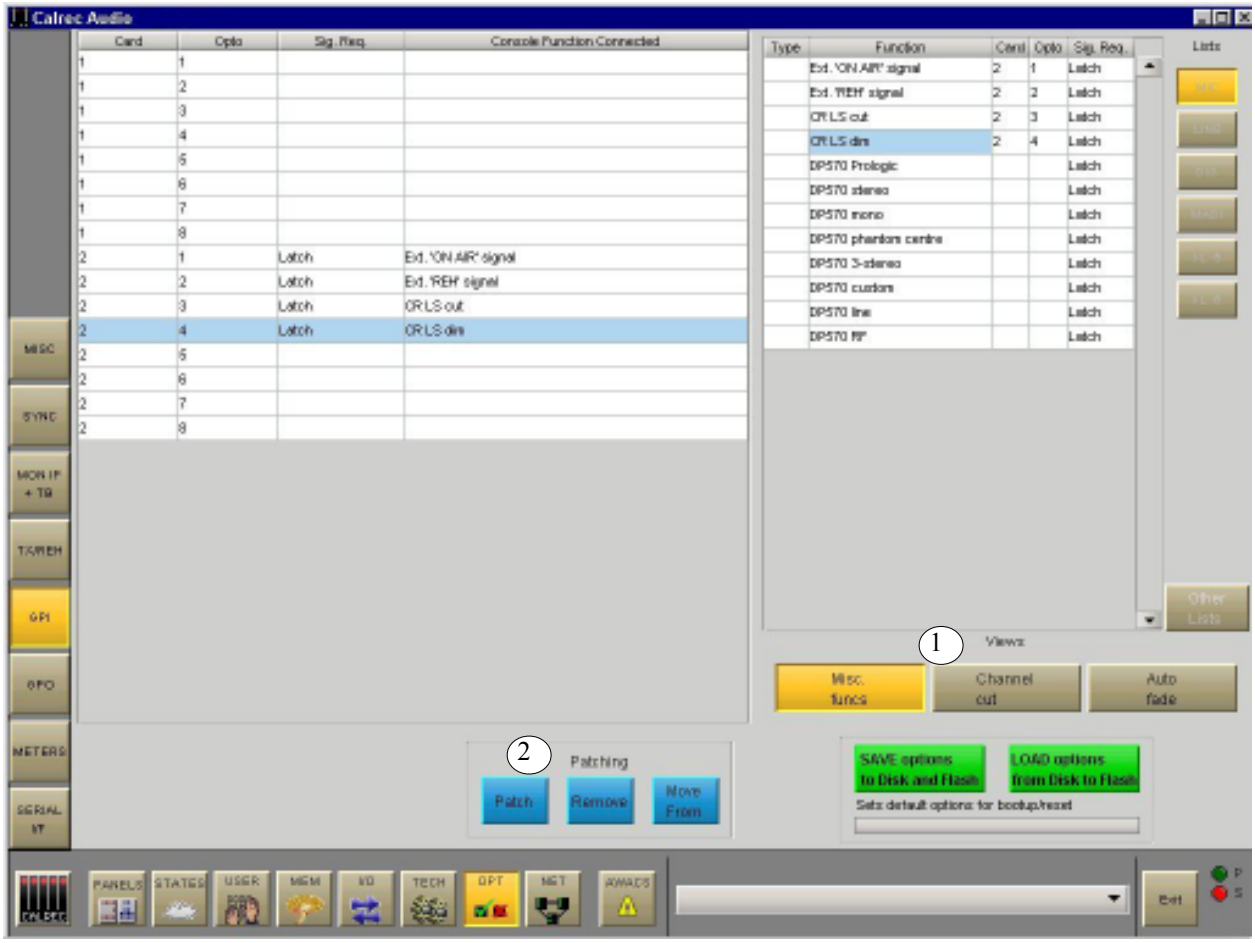
To make an assignment, select a function (left side of screen), and a relay-isolated output (right side of screen), and select Patch. Assignment can also be moved and removed, in a similar way to port connections.

(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 SCREEN



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 (see page 68).

(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.

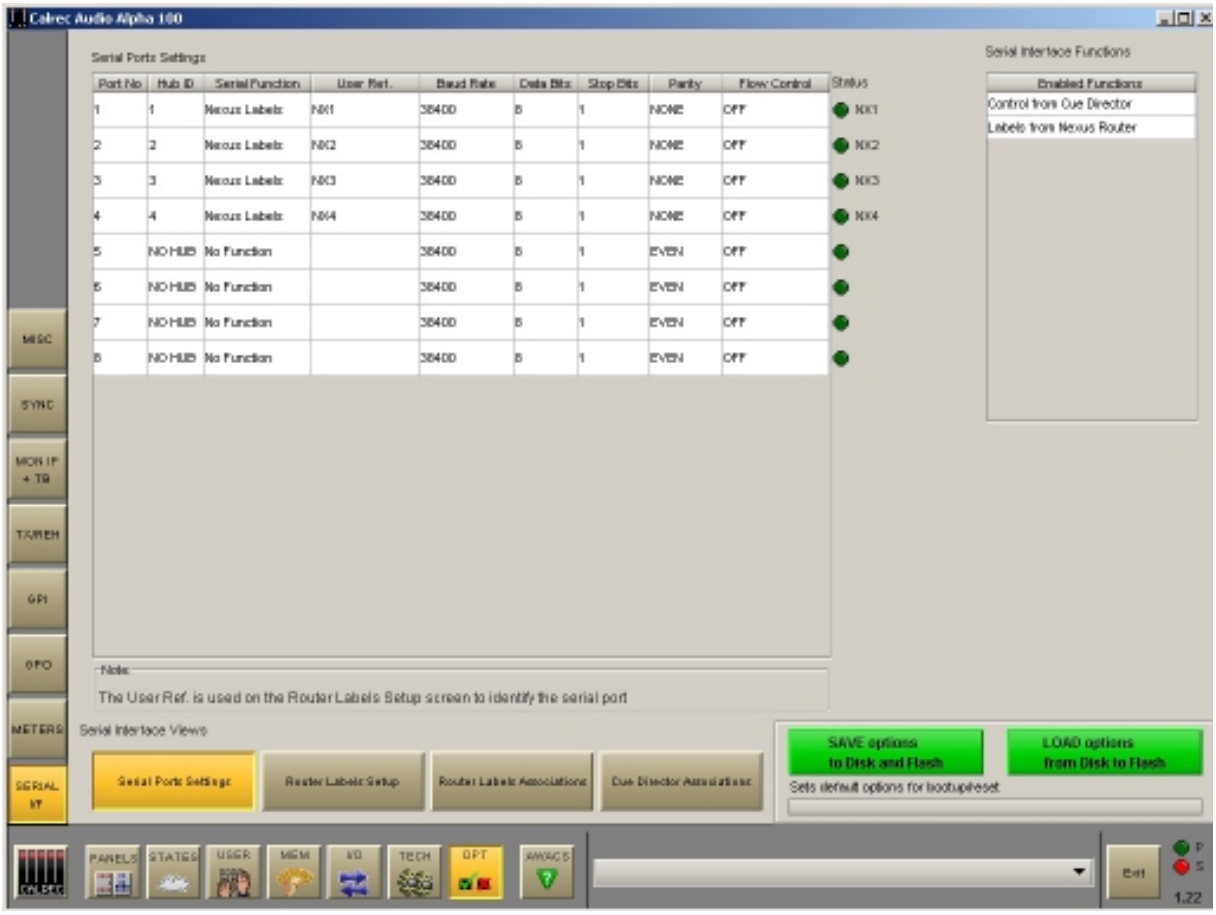
SERIAL INTERFACE

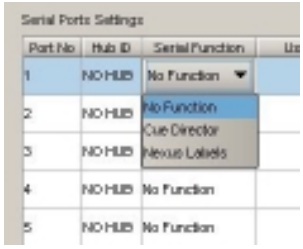
The system currently supports the following serial interfaces:

- 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.

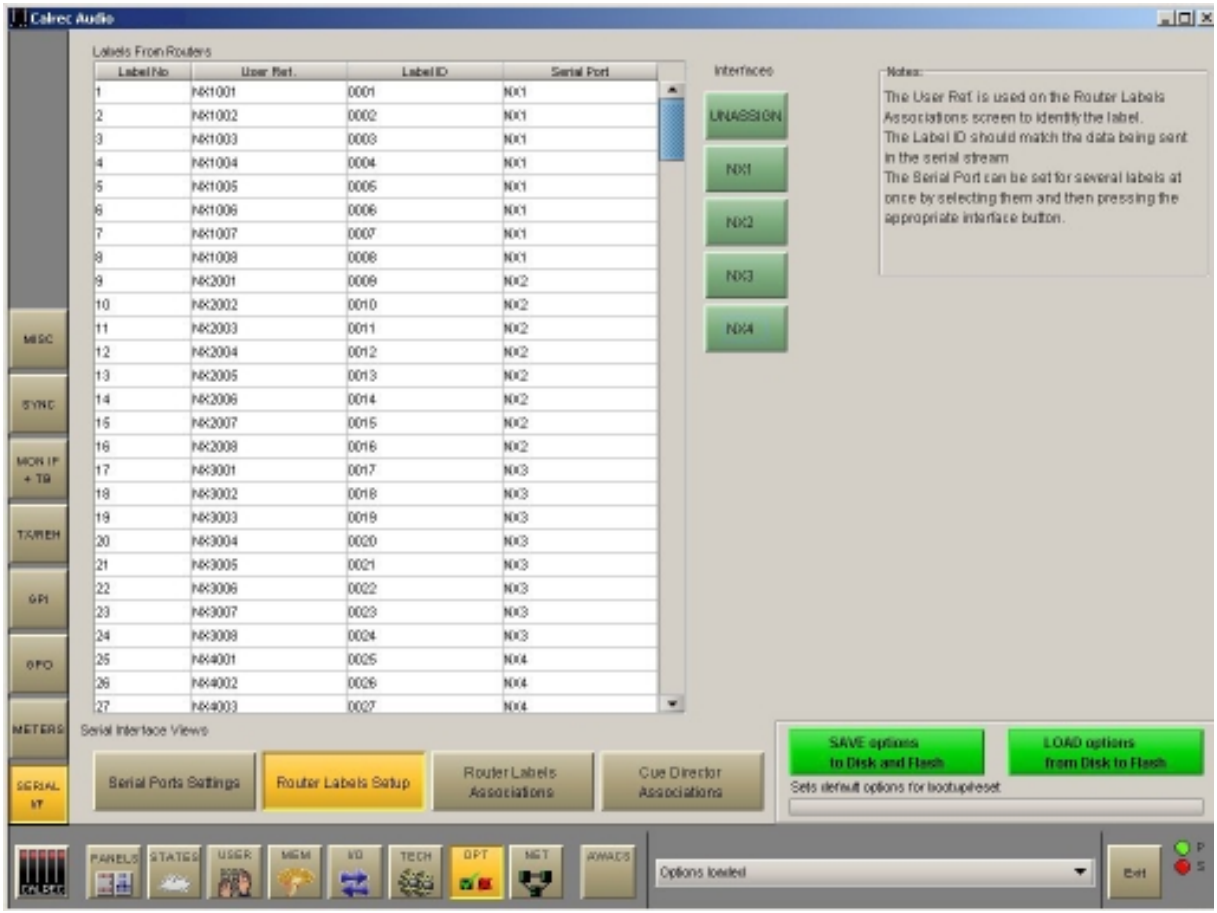
The function can be given a name by typing up to six characters in the USER REF column.

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.

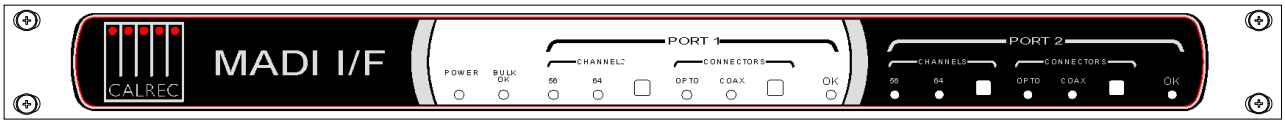
When an association is made, the cell will turn yellow. Associations can be unmade by selecting the cell again, whereby its colour will change back to grey. The +1 button is used to automatically move diagonally down the grid to the next association cell and toggle its condition. The action occurs out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

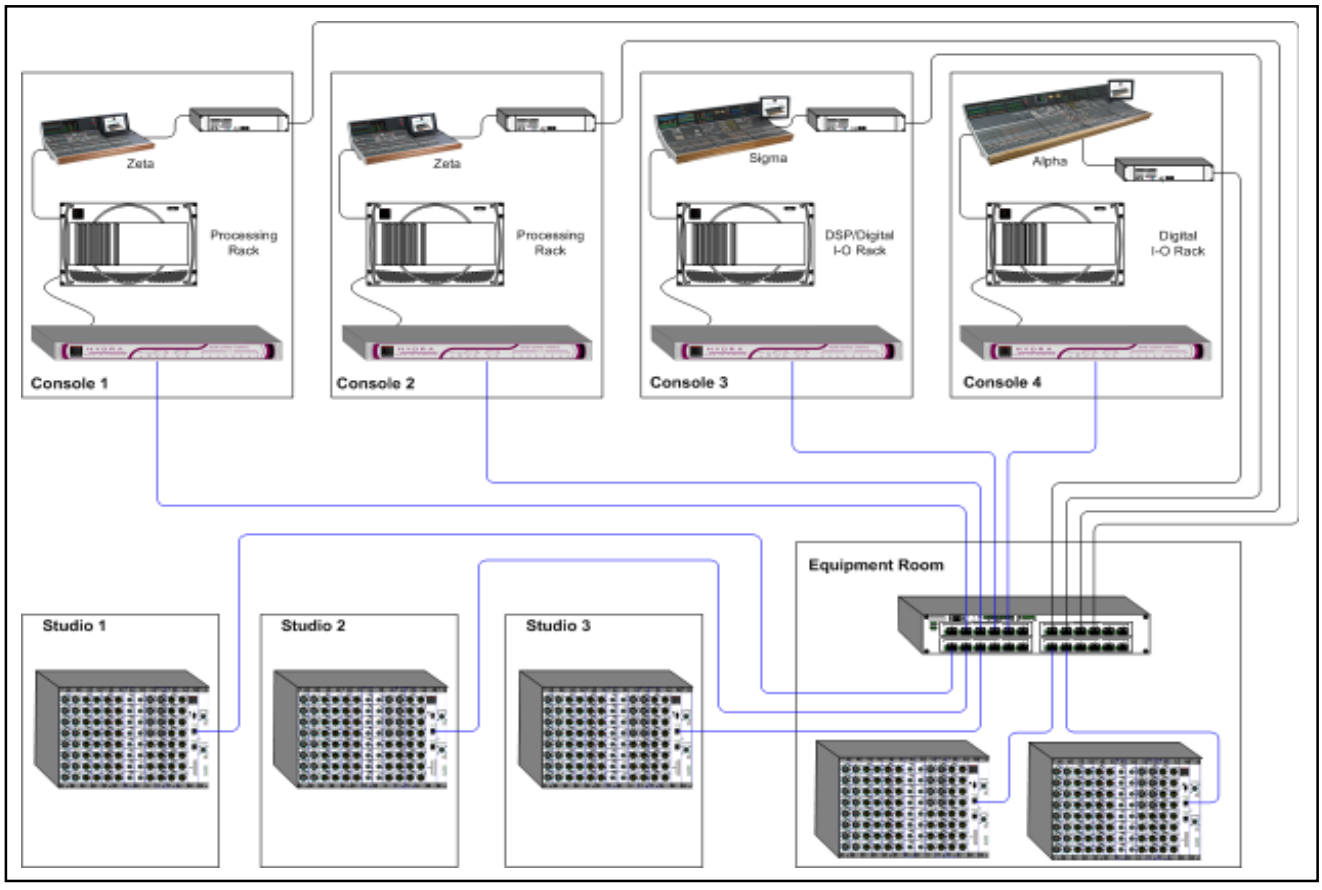
MADI



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 Racks, 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.

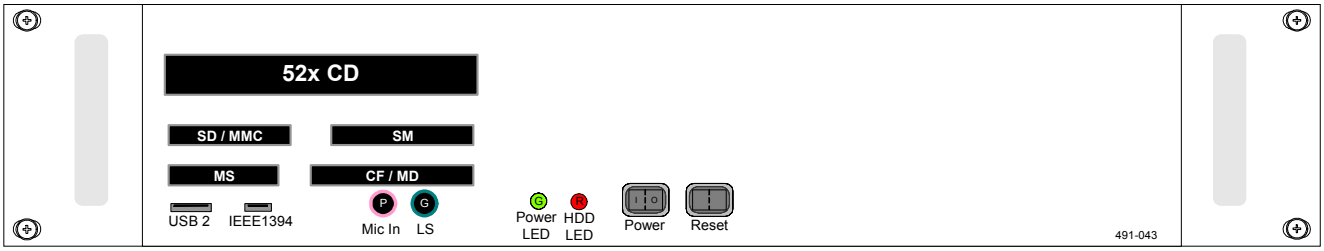


PC INFORMATION

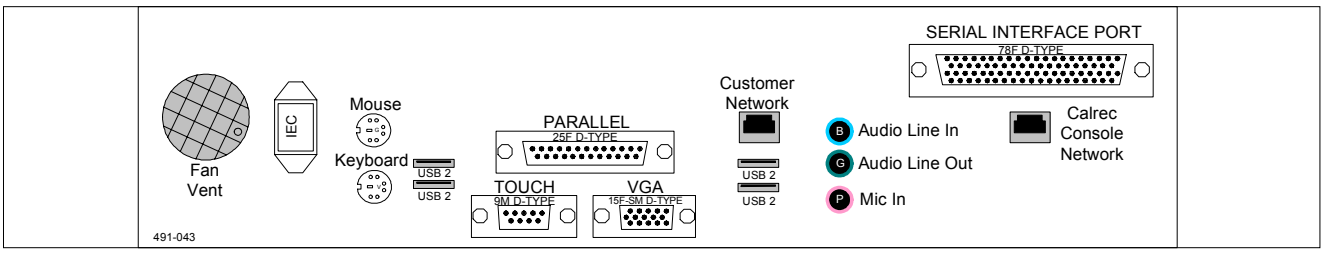
Failure of the console's PC does not prevent continued operation of the control surface or the audio.

Operating System	Windows 2000
CPU	Intel Celeron Processor (2 GHz)
RAM	256 MB DDR RAM
HDD	40 GB
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 each 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

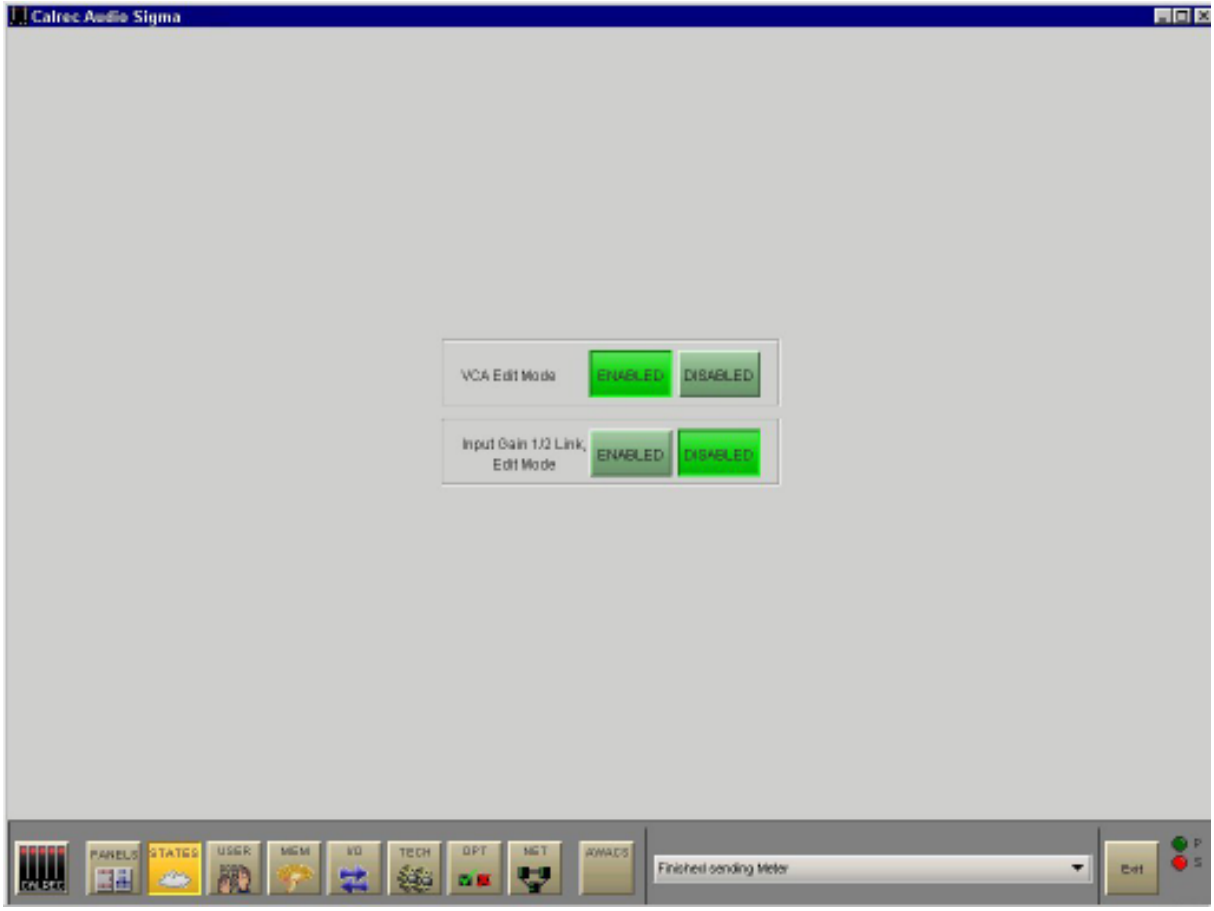
Calrec recommends that the PC is regarded as an integral control device for the console, and not as a general purpose PC. If 3rd party software is installed on the PC, care must always be taken to ensure that it does not interfere with the normal performance of the PC. The installation of inappropriate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

File Backup

A number of flash card slots are provided on the front of the PC for file backup. In addition, backup could also be to a LAN or to a USB device which can be plugged into the front or rear of the PC. The following files are not installed from the CD-ROM as they are specific to each individual console. As such, a backup copy should be kept of these files in-case of PC or hard-drive failure:

Filename	Description
C:\Sigma\Cust1\Config.ini	This file should only be altered by an approved Calrec engineer using a specifically designed application. The file can be copied but any unauthorised changes made will render it in-operable, including changing the date stamp of the file (such as saving even if not edited). If the file needs to be e-mailed to Calrec for any reason it should always be zipped to protect the file time/date stamp. A new backup copy of this file should be made after a console upgrade.
C:\Sigma\Cust1\Setup.ini	This file is updated when changes to console settings are made and saved using the set-up application. It should not be altered by any means other than by using the set-up application. A new backup copy of this file should be made after such changes are made or after a software upgrade.
C:\Sigma\Cust1\Options\Options.bin (Or **C:\Sigma100\Cust1\Options.bin** in earlier software versions)	This file is updated and a new backup should be made when changes to any of the sub-pages of the options screen are made and saved.
C:\Sigma\Cust1\memories	This is the default location for the user memories, however operators can choose to save them to any location they desire. The maintenance department should keep a backup of the important default memories, whilst operators should be encouraged to keep their own backups of their own memories and to update them whenever they make important changes to them. After a software upgrade the main set of memories will be upgraded and checked by the engineer carrying out the upgrade. A new backup should then be made of these memories.
C:\Sigma\Cust1\Meter	This is the default location for the user-definable meter configurations. If your console uses these, you should also keep a backup copy of the files in this folder.
C:\Sigma\Cust1\Monitor	This is the default location for the user-definable monitor panel configurations. If your console uses these, you should also keep a backup copy of the files in this folder.
C:\Sigma\Cust1\Network	If your console uses Hydra Audio Networking, you should also keep a backup copy of the files in this folder. These are the configuration settings for the network units.
For customers using Compaq PC's only: **C:\Sigma100\Cust1\A100fe1.ini** **C:\Sigma100\Alphaprg\Alphaprg.ini**	These files are installed from the CD-ROM in a default format. The settings in these files can vary in different Compaq PCs. The backup of these files should be updated after a software upgrade. If a new hard-drive is fitted to the original Compaq PC, these files should be used to over-write the versions installed by the CD-ROM.

STATES SCREEN 



VCA Group Edit Mode

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

Input 1 and 2 Gain Linking

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. This function is enabled and disabled using the buttons on this screen.

Important Operational Differences Between Product Versions

IMPORTANT OPERATIONAL DIFFERENCES BETWEEN PRODUCT VERSIONS

Please note that some version numbers are not generally released for all products, and are therefore not documented here.

V1.16 included:
New PC front end Application, with new colour scheme, faster start up time, fader memory load time, multiple patching on I/O screens, Replacement of drop-down boxes with buttons which are easier to use on a touch screen, New JRE for improved performance.

Bird Beater now available on all Auxes (previously available only on Aux 1)

Input 1/2 switching option on the channel/group fader module.

Preview Memory - Memories can be previewed on thee channel strips and non-assignable panels. When the preview button is pressed, the Selected Memory's settings will be displayed on the control surface.

When a stored memory is loaded onto the console from disk, the system checks that the current desk configuration matches that of the stored memory. If there are discrepancies, a warning that the memory may not work correctly will be given.

Support for the MADI interface option.

A warning will now appear to prevent the front end application being launched twice.

The Oscillator's External inputs (stereo and mono) are now available.

Stereo tone feeds all stereo outputs (instead of mono tone)

Motorised Joystick (Optional)

Screen based Oscillator controls made available.

Copy screen added.

TTL Wordclock can now be used as an external synchronisation source.

The desk can be put into "User", "Technician" and "Supervisor" password protected Modes.

Locking of output port assignments in "Technician" Mode.

PFL is prevented from feeding more than one set of loudspeakers at once. i.e. PFL to small LS or to PFL LS to be off if PFL to Mon. Also, off if PFL to Sel 2 & Sel 2 to Mon.

Sel 1 & 2 is now available on the SLS selector, via the Setup application.

Revised metering selection system to allow more choice of signals, different types of meter on the same signal, metering of any external input, and up to three stereo phase meters (requires new hardware).

"PFL to Mon " option buttons have been moved to the User screens (previously on the Options - Misc screen).

V1.17 included:
Hydra Audio Networking - Allows dynamic routing of signals to and from Hydra I/O Racks

The configuration of the Hydra I/O Racks can be done from the network editor integrated into the front end application.

Grab Feature - Ability to grab source ownership from input screens on front end application.

New screens on Front End, accessible via NET button.

V1.19 included:
Partial Memories - In addition to full console memories, this function allows only certain components of settings to be saved and recalled. New front end screen under the Memory screen tab.

Automatic Cross Fading - To provide cross-fades from GPI opto inputs, with user-definable fade out and in times. New screen under Options tab for configuration.

Wild control push-switch option - Allows Aux send ON/OFF and Front Pan IN/OUT to be controlled using the Wild control push-switch on the channel control module. Enabled using the Options-Misc screen.

Input 1 & 2 gains on separate Wild Controls - Allows input 2 gain to control a separate analogue port which can be patched directly to an output (in parallel), for use as a tape send where input 1 is the tape return.

Enhanced VCA grouping system allowing VCA masters to be used as slaves in another VCA group.

V1.22 included:
Introduction of TFT meter panels. All meters have to be allocated at runtime. No defaults are provided. The allocations are saved in options. The Setup Application is used specify the position of the meter panels, (both TFT and standard meters). The OPTIONS - METER screen is then used to configure the layout of the TFT meter panels and allocation to all meters.

The Setup application is used specify the position of the meter panels, (both TFT and old style Meter panels).

Nexus Router support - OPTIONS-SERIAL screen is used to allocate labels to input ports on a Nexus Router. These will replace the input port labels on the faders when the router is online.

Linking gains of inputs 1 and 2 - Option to link input 1 and 2 gains so that back-up mic gain can track changes to main mic gain. Link works both ways, maintaining the offset between the two gains.

Memory load times decreased.

DSP link usage optimized.

The Config Application and Programming Utility have been redesigned. The functionality has not changed.

V1.23 included:
Introduction of new style assignable monitor panels. The type of monitor anel fitted must now be chosen in the configuration. The old and new style panels cannot be mixed in a console.

The Setup Application is used to select:-

- The width, phantom centre and LFE off settings of the monitor outputs.
- The PFL RTB LS.
- The Sw 3 Input.
- The Main Line Internal/External settings.
- The new monitor panels output 1-6 and Meter 1-3 Labels.
- Which monitor outputs work the Mic Open system.
- Which monitor outputs work with Studio TB.

There are now 4 Surround and 4 Stereo Outputs. On the standard monitor panels the Main LS, Small LS, Desk H/P and Studio LS1 can be surround, but Studio LS2 and Studio Phones are stereo only. On the new style monitor panels the Main LS, Small LS, Monitor Output 1 and 2 can be surround, monitor output 3, 4, 5, 6 can be stereo only.

Monitor selector buttons for both style panels are allocated using the OPTIONS - MON I/P+TB screen. The selections allocated are saved with the options. The Front End must be in 'Technician Mode' to set the monitor selector buttons on the standard monitor panels. The new style monitor panels are updated when the 'Save to file Load into Desk' button is selected.

The LS Monitor Insert is now operational (both with the standard and new style monitor panels). The send ports are patched on the I/O - OUTPUT - MON, TB & OSC screen. The return ports are patched on the OPTIONS - MON I/P & TB - MON SEL (EXT I/P) screen.

The PANELS -DELAY screen controls mimic the Input Delay Panel controls, allowing operation from the sceen. In addition the screen has buttons to select the display units as 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.

Delay controls can be assigned to wild controls providing that the Delay Panel is installed. The button press to assign wild delay controls is not implemented on the front end screen. If the wild shaft push feature is enabled on the OPTIONS-MISC screen, pressing a wild delay control shaft will toggle the delay in and out. There can be separate delay resources assigned to input 1 and input 2 of each channel. The delay panel shows information relevant to the active input. During interrogation, the fader assign button lights if either input has delay assigned.

Old meter types are now fully supported including trimod displays. These use the same allocation system on the OPTIONS - METERS screen on the front end as the new TFT meters.

V1.24 included:
The console and rack software now provide a network redundancy feature which monitors active network paths and re-routes audio automatically if the network path fails. NET->Device Status screen shows the preferred port and which ports can be seen by the console. Networking screens altered to allow a second IP address to be assigned to a Hydra I/O Rack. Hydra inputs can be patched directly to local outputs. Hydra inputs now work with GPIO system.

Remote mic cut system has been increased to 5 Mic Busses and now works with networked inputs. It also now takes into account the Channel/Group Cut button.

V1.25 includes:
System Plus changes.

NOTES

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