

SIGMA OPERATOR MANUAL V2.8



Digital Broadcast Production Console with Bluefin HDSP



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SIGMA CONTENTS

Important Information	4
Health and Safety	5
Technical Support	6

Overview **7**

Introduction	8
Principal Features	9
System Specification	10
Layering And Assignable Control	11
Paths And Ports	12
Signal Paths	13
Inputs and Outputs	14
Getting Started	15
Touch Screen Layout	16
Error Messages (AWACS)	17

Fader Area **19**

Channel and Group Faders	20
Channel Control	21
Assignable Fader	22
VCA Grouping	23
Automatic Cross-Fading	24
Layer Locking	26

5.1 Surround **27**

5.1 Surround Channels	28
Points to Remember	31

Input and Output Controls **33**

I/O Matrix	34
Input/Output Controls	36
Direct Output and Mix Minus	37
Stereo and Surround Panning	38
Motorized Joystick Panel	39
Delay	40

Channel Functions **41**

User-Chan Screen	42
EQ and Filters	44
Dynamics	45
Channel Copy	46
Broadcast Facilities	47
Console Functions	48

Busses **49**

Routing and Track Output Controls	50
Routing Matrix	52
Main Outputs	53
Busses Screen	54
Auxiliaries	55
Talkback	56
Oscillator Screen	57

Memories **59**

Memory Controls	60
Memory Set Up Screen	61
Memory Isolation	62
Partial Memories	63

Monitoring System **65**

Assignable Monitoring & Metering	66
Monitor Panel Setup	67
Saving and Restoring Configurations	68
Misc Output and Meters	69
Control Room Misc Functions	70
Decoder Remotes	71

Metering System **73**

TFT Meters	74
TFT Meter Setup Screen	75
Adjusting TFT Screen Layout	76
Meter Configuration	77
TFT Configuration Examples	78
Saving and Restoring Configurations	81

On-Screen Patching **83**

Input ports	84
Output Ports	85
Assignable Insert Sends	86
Assignable Insert Returns	87
Insert Screen	88
Main Insert Sends	89
Main Insert Returns	90
Monitoring, Talkback And Oscillator	
Outputs	91
Direct Output Ports	92
External Meter Output Ports	92
Input-Output Ports	93
Direct Input Ports	93
Input Usage Screen	94

Port List Management **95**

Port List Allocation	96
Port List Order	97
Sorting and Managing Port Lists	98
Saving and Restoring Lists	99

Engineering Information **101**

Tech Screen	102
Operational Modes	103
Miscellaneous Screen	104
Synchronization Screen	105
Talkback And Tone Inputs	106
External Monitor Inputs	107
External Meter Inputs	108
States Screen	109
Condition Switching	110
General Purpose Outputs Screen	111
General Purpose Inputs	112
Serial Interface	113
Router Label Setup Screen	114
Router Label Association Screen	115
MADI	116
PC Information	117
File Backup	118

Hydra Audio Networking **119**

Hydra Technology	120
Typical Hydra Network Example	121
Hydra I/O Boxes	122
Fixed format boxes	123
SDI Boxes	125
Modular Hydra I/O Boxes	126
Modular Hydra PSU	127
Modular I/O Box Configuration	128
Network Configuration	129
Hydra I/O Source Lists	130
Device Status	131
Patching Hydra Sources	132
Source Ownership	133
SDI inputs	134

Appendix A - Offline Editor **135**

Part 1 - On The Console PC	136
Part 2 - On The Laptop PC	137
Part 3 - On The Console PC	140

Appendix B - Style 1 Faders **141**

Channel And Group Faders (Style 1)	142
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Appendix C - Traditional Style **143**

Monitor Panel 143	
Traditional Style Monitor panel	144
Monitor Selector Set Up	146
Monitor LS Set Up	147
States Screen	148

Appendix D - Version Changes **149**

Version Changes	150
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IMPORTANT INFORMATION

After Sales Modifications

Please be aware that any modifications other than those made or approved by Calrec Audio Limited or their agents, may invalidate the console's warranty. This includes changes to cabling provided by Calrec and variations to the recommended installation as detailed in Calrec documentation.

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 modification 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 its 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, analog parts can however still be affected.

Please observe the following:

- 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, 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

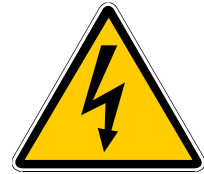
Cleaning

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.

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 :-

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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 (Monday - Thursday 9:00 a.m. - 5:30 p.m. Friday till 4:30 pm). Outside these 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.

Support contracts

Several levels of support contract are available either from your local distributor or from Calrec. All levels provide 24/7 phone support and higher levels include additional benefits.

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.

Operator and installation manual PDFs

This manual and the Alpha Installation manual can be found in pdf format on your console's CD Handbook.

You can also access this manual on your console's PC from the Start menu, under the Calrec Sigma group.

SIGMA 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.

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.

Bluefin

The Bluefin High Density Processing System provides 320 equivalent mono signal paths - and can provide this incredible power on just one card. The Bluefin technology project has been in development for a number of years and elements of the technology have been used in the Alpha console since its launch in 1999. It is a proprietary architecture which has been conceived and developed entirely within Calrec.

Bluefin processing provides benefits beyond size and functionality. Calrec products have an unrivalled history of reliability and Bluefin further enhances this. The design generates less heat, uses less power and back-plane activity is reduced. System resilience is improved by 100% redundancy of all processing elements through the provision of a second card – it is like having another console as a hot spare.

The reality of HD programming is that it will continue to create more demand for 5.1 content. This technology meets production needs for HD production and live to air delivery far into the future.

Commitment

Calrec's continued commitment to customer value means Bluefin technology is fully retrofit-able to existing Sigma consoles. Having to increase console capacity to cope with HD television will not involve buying a new desk for existing Calrec users.

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.



Certificate number 3205/02



Certificate number 3205/02

PRINCIPAL FEATURES

CHANNEL / GROUP FACILITIES

- Up to 320 mono equivalent channels: 108 stereo channels plus 104 mono channels.
- Up to 52 full 5.1 surround channels allocated from available channel resource.
- 8 x 5.1 surround, stereo or mono audio groups.
- All channels and groups have 4-band EQ, 2-band Filters, Compressor/Limiter and Expander/Gate.
- Separate 2-band EQ and 2-band Filters for Dynamics side-chain.
- Up to 192 mono equivalent assignable inserts for outboard gear.
- All channels and groups can have a direct output or a mix-minus feed.
- Direct outputs can be pre EQ, pre fader, or post fader.
- Automatic cross-fading facility, with user-definable fade out and in times.
- Additional VCA style grouping system.
- Every channel can route to every buss, at the same time, without restrictions.

BUSSES

- 2 main plus 2 sub-main stereo or 5.1 surround outputs
- Main and sub-main outputs have 4-band EQ, 2-band Filters, Compressor/Limiter and Expander/Gate.
- 20 auxiliary outputs which can be 20 mono or 10 stereo.
- 48 outputs for multi-track or general purpose feeds.
- Simultaneous LCRS, stereo and mono outputs available from each 5.1 main output.
- Direct input available to group, mains, aux and mix-minus busses.

SYSTEM

- 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.
- All faders are motorised and touch-sensitive.
- A centrally assigned fader allows control of any fader from the optimum listening position.
- Comprehensive surround panning and monitoring.
- User-definable panels for monitor selection and control.
- Flexible TFT screen-based meters with total user-configurability.
- Delay available on on channel inputs, channel, group and main insert sends and returns, and channel and group direct outputs.
- Optional I/O expansion via a wide area interface such as MADl or Hydra, Calrec's sophisticated audio networking system.
- On board Flash ROM memory system allows 99 full console or partial memories.
- PC backup allows an unlimited number of memories.
- Sophisticated GPIO facilities.

RESILIENCE

- Console operates independently 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 with no loss of audio.
- Last settings fully restored on power-up or reset.
- Automatic change over to hot spares for power supplies, control cards and DSP card.
- All cards and modules are designed to be hot plugged.
- All cards and modules are designed to initialise upon insertion.

SYSTEM SPECIFICATION

Digital inputs		
Formats supported	AES/EBU (AES3) 24-bit Also suitable for use with SPDIF (IEC958 Type 2) signals	
Interface	110 Ohm transformer balanced, 5V Pk-Pk 75 Ohm unbalanced (BNC), 1V Pk-Pk	
Sample rate conversion	24 bit switchable on all digital inputs	
SRC THD+N	-117dB @ 1kHz, 0.00014%	
Digital outputs		
Formats supported	AES/EBU (AES3) 24-bit	
Interface	110 Ohm transformer balanced 4V Pk-Pk (nominal) into 110 Ohm load 75 Ohm unbalanced 1V Pk-Pk (nominal) into 75 Ohm load (BNC)	
Analog inputs		
Analog - digital conversion	24 bit	
Input	Electronically balanced	
Input impedance	>1k Ohms for mic gains 10k Ohms for line gains	
Sensitivity	+18 / -78dB on mic/line input card +18/-24dB on line only input card.	
Equivalent input noise	-126dB (150 Ohm source)	
Distortion	-1dBFS @ 1kHz - Better than 0.003% -20dBFS @ 1kHz - Better than 0.006% -60dBFS @ 1kHz - Better than 0.3%	
Frequency response	20Hz to 20kHz +/- 0.5dB on mic/line input card 20Hz to 20kHz +/- 0.25dB on line only liput card	
Input CMR (Common Mode Rejection)	>70 dB (Typical 80dB) on line inputs >75 dB (Typical 85dB) on mic inputs	
Analog outputs		
Digital - analog conversion	24-Bit	
Output balance	Electronically Balanced, 20Hz to 20kHz, Better than -35dB, typically -45dB	
Output impedance	<40 Ohms	
Distortion	-1dBFS @ 1kHz - Better than 0.006% -20dBFS @ 1kHz - Better than 0.003% -60dBFS @ 1kHz - Better than 0.3%	
Frequency response	20Hz to 20kHz +/- 0.25dB	
Performance		
Digital to digital (AES/EBU) distortion	-1dBFS, 20Hz to 10kHz - Better than 0.002%	
Digital to digital (with SRC) distortion	-1dBFS, 20Hz to 10kHz - Better than 0.005%	
Frequency response (Analog input to output)	20Hz to 20kHz +/- 0.5dB	
Synchronization		
48kHz synchronization	NTSC/PAL video Internal crystal reference TTL wordclock (48kHz) AES/EBU digital input (48kHz)	
Environmental considerations		
	Operating	Non-operating
Temperature range	0°C to +30°C (32°F to +86°F)	-20°C to +60°C (-4°F to +140°F)
Relative humidity	25% to 80% Non-condensing	0% to 90% Non-condensing
Maximum altitude	2,000 metres (6500ft)*	15,000 metres (49,000ft)

Analog input for 0dBFS can be pre-set globally to +28, +24, +22, +20, +18 or +15 dBu

Pre-fader headroom on analog inputs is adjustable globally from +24 to +36dB in 2dB steps

Analog output for 0dBFS matches input setting into >1kOhms (+24dBu max into 600 Ohms)

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

LAYERING AND ASSIGNABLE CONTROL

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. When switching between A and B, the fader will move to the correct position, and the displays will show settings for the selected path. The colour of the displays on the fader strip indicate the active path: Green for A, Amber for B.

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 can be set to operate momentarily). This arrangement allows more channels to be fitted into the space available in the frame.

A setup option allows selected faders to be excluded from the ALL A or ALL B function. An additional option then allows the individual fader A and B buttons to be disabled to eliminate the risk of a critical audio channel not being on the surface at all times.

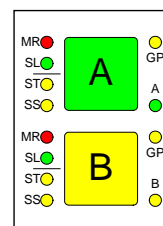
Assignable Control

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, stereo channels, surround masters or groups.



PATHS AND PORTS

Paths and Ports

On an analog 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 analog 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 using the Options - Port List Screens. This allows inputs and outputs which are wired for similar purposes to be grouped together for selection. Each list can contain a mixture of normal inputs or outputs (labelled in pairs) and inputs or outputs dedicated to mono signals.

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 I/O Matrix and I/O screens. It is possible to restrict the lists which appear on the I/O Matrix using the Options - Misc screen. This ensures that only the relevant lists are immediately available at the user's fingertips. All lists are always available on the I/O screens.

SIGNAL PATHS

The system can have 320 equivalent channels: Up to 108 stereo plus 104 mono channels. Up to 52 5.1 surround channels can be created, each of these will use the resources of 2 stereo and 2 mono channels.

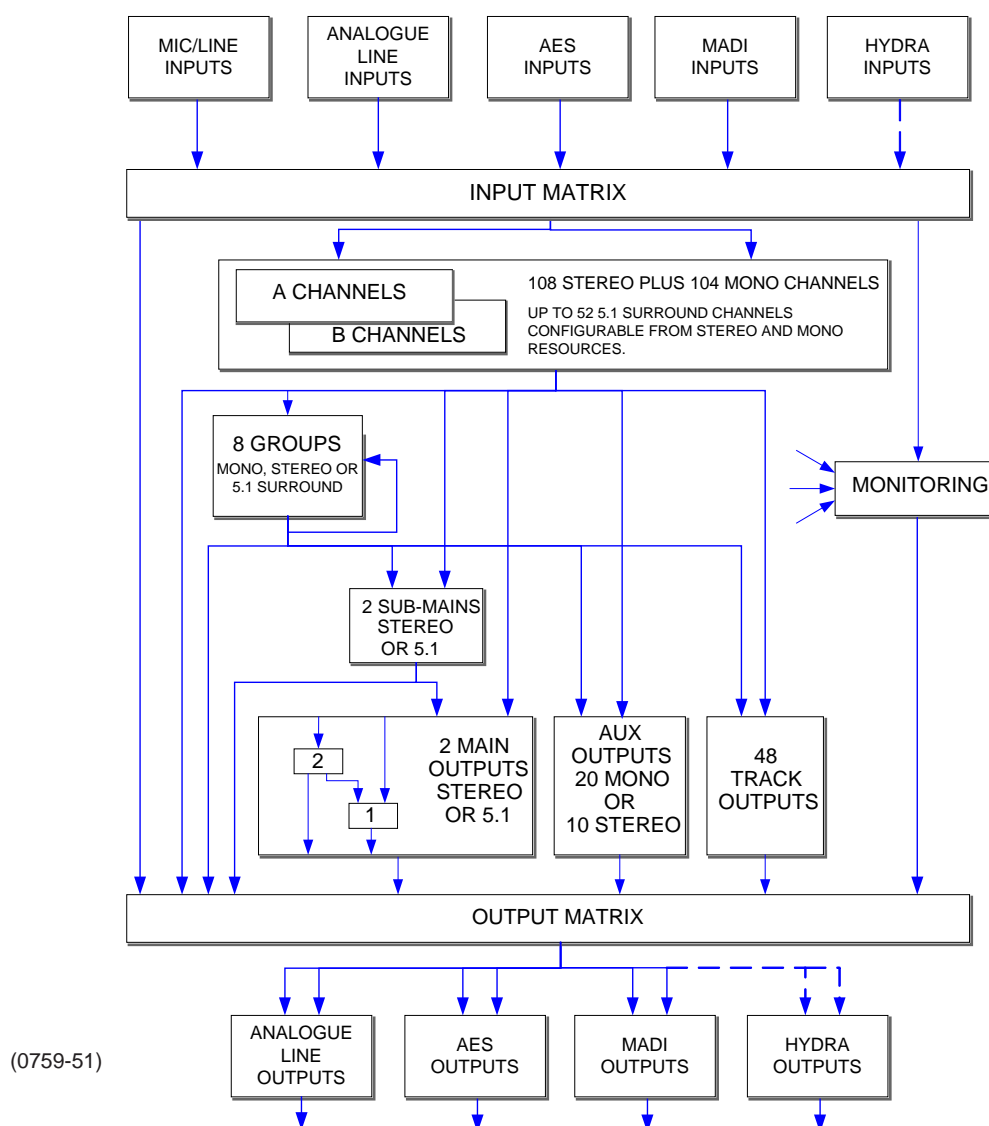
The 8 groups can each be designated as mono, stereo or full 5.1 surround. In addition, as many VCA style groups as required can be created.

If a main or sub-main output is designated as 5.1 surround, then a mono rear is

derived at the output to allow it to be used as LCRS mains. Stereo and mono downmixes of the 5.1 are also produced.

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

The 20 mono auxiliary outputs can be paired up to give up to 10 stereo auxiliary outputs.



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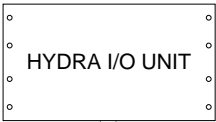
--- Please note that Hydra inputs cannot be patched to Hydra outputs

INPUTS AND OUTPUTS

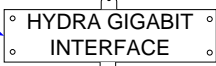
****Wide Area Bulk Cards are used to expand the I/O of the system via a wide area interface such as MADI, or Hydra - Calrec's sophisticated audio networking system.**

The system can have up to 8 Wide Area Interfaces.

Please note : If the maximum number of WAB cards are used (8), then one of the 3 remaining AES I/O slots in the Digital I/O rack must be left unused.



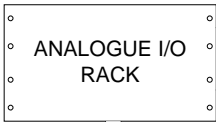
Hydra I/O units can interface up to 96 inputs and 96 outputs, analogue or digital. These units can be local or remotely located.



Interfaces up to 128 mono inputs and 128 mono outputs. Each Unit Requires a wide area bulk card in the Digital I/O Rack.



Interfaces up to 128 mono inputs and 128 mono outputs. Each Unit Requires a wide area bulk card in the Digital I/O Rack.



Up to 8 Mic/Line or Line input cards, each providing 8 stereo inputs per card.

Up to 8 Line output cards, each providing 8 stereo outputs per card.



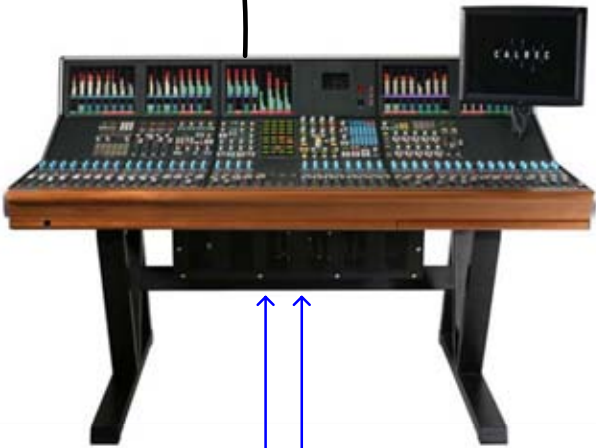
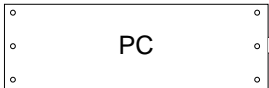
Up to 11 AES cards, each providing 16 stereo inputs and 16 stereo outputs.

8 of the AES card slots can be occupied by Bulk I/O cards (Max 5)* or Wide Area Bulk (WAB) cards**.

2 DSP cards (1 plus 1 hot spare)

*** Bulk I/O cards are used to interface to Analogue I/O Racks. Each Rack interfaces 128 mono inputs and 128 mono outputs.**

There can be up to 5 Analogue I/O Racks in the system.



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2 CONTROL PROCESSOR CARD SLOTS (1 PLUS 1 HOT SPARE).

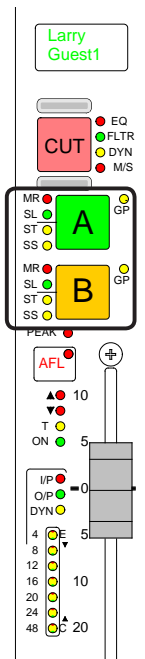
4 GPIO CARD SLOTS (MINIMUM 2)

The largest system (in terms of I/O) would have 8 WAB cards and 2 AES cards. If one WAB card is reserved as a redundant hot spare, this system would have 896 mono I/O on WAB interfaces, plus 32 stereo AES I/O. If all WAB I/O was AES through a Hydra network, the system could have up to 480 stereo AES on the system.

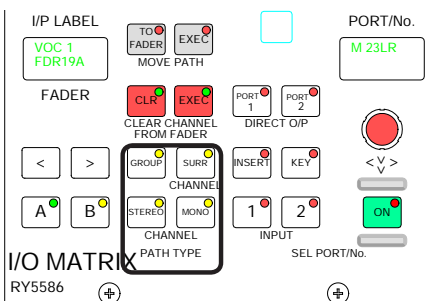
GETTING STARTED

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

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



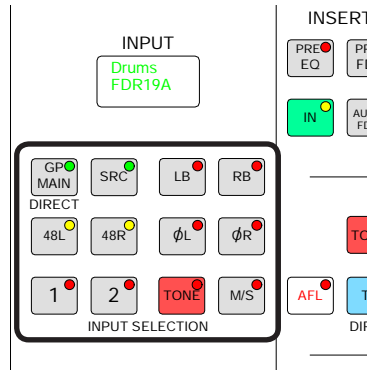
Next, go to the I/O Matrix panel and, if a path type is not already indicated, press either the mono or stereo buttons to assign a mono, stereo or 5.1 surround channel to the fader.



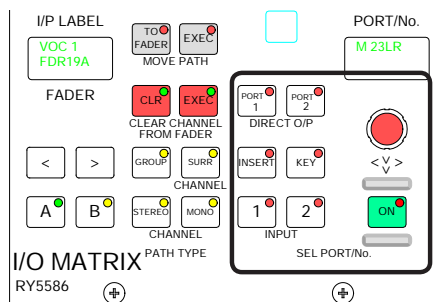
Channel path type selection can also be done using the USER - CHAN screen.



Next, go to the **Input/Output** panel and select one of the channel's two inputs 1 or 2.



Return to the **I/O Matrix** panel and also select Input 1 or 2 in order to assign a port to it. Do this by turning the selector control knob to scroll through the available ports.

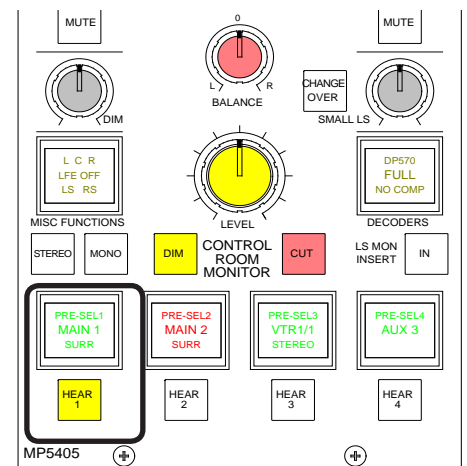


Pressing the knob down and turning it will switch to another list of input ports (providing these have been set up on the Options - Port List screens). Once you have arrived at the port you want, press the ON button to connect it (this is like inserting the patch cord).

Port assignment can also be done using the I/O screens.

Set the input gain, panning, etc, on the Input/Output panel, the EQ and Dynamics on their respective panels, and route the signal, to Main 1 say, 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 controls are set correctly you should hear the signal.



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

TOUCH SCREEN LAYOUT

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

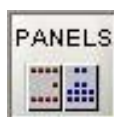
The Front End screens are divided into groups which are accessed using the buttons along the bottom of the display. Within each group there are a number of screens accessed by buttons up the left side of the display. On some screens, there are additional buttons to access sub-sets of the screen's function.

Options Settings

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 out without losing the original settings and these original settings can be restored without having to re-boot the system.

Second PC screen

The software now supports use of a second PC screen which is configured as a Windows 'extended desktop'. Any of the screens showing a LOCK SCREEN button can be sent to that second monitor by pressing the button. They will remain on the second monitor whilst the main monitor is reassigned to any other required functions.



Operational reproductions of the EQ, Dynamics, Routing, Aux Send, Aux Output and Delay panels; providing alternative controls.

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, troubleshooting 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, port lists, serial interface and label associations, GPIO and condition switching.

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

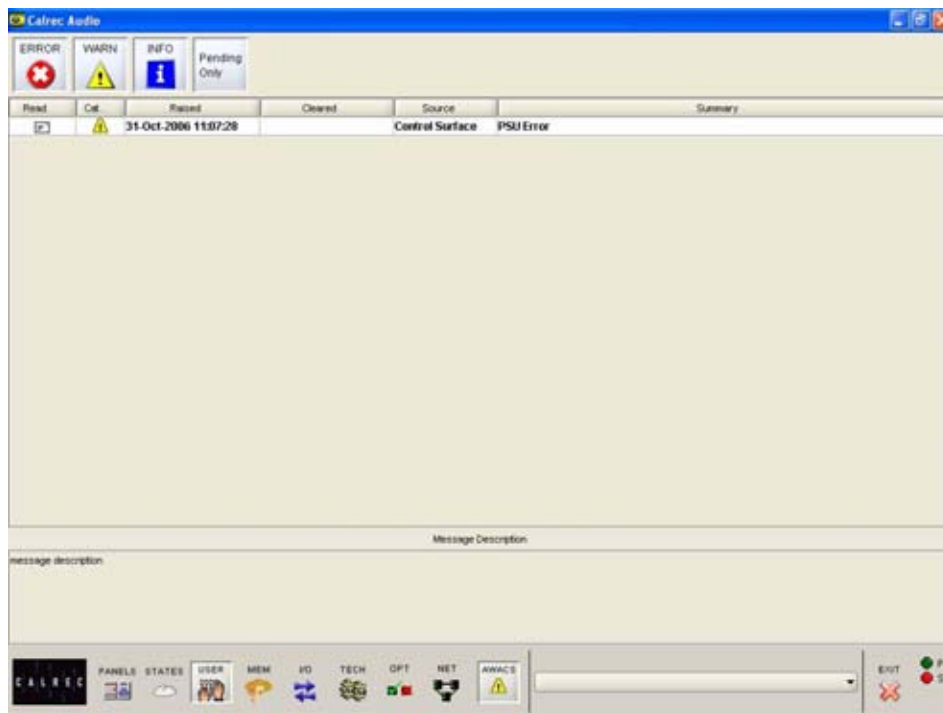


Screens for setup and control of an audio network system. These screens are only visible if Hydra audio networking is installed.

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).

ERROR MESSAGES (AWACS)

If a problem does develop, messages will be delivered on the Automatic Warning and Correction System (AWACS) screen.



The AWACS button at the bottom of the screen will flash to alert the user that a message has been reported. Selection of this button will open the AWACS page, where messages can be viewed.



Selecting a message will reveal a more detailed description. Message history is saved to the PC's hard disk for future analysis.

Three types of messages are reported:



Information messages, eg "Control Surface UN4806 processor 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, it is possible to continue operating after errors are reported. If un-cleared errors are still present, an icon will flash in the AWACS button. 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.

It is possible to set the PSU Fail Indicator button on the Broadcast Facilities panel, to flash when an error message is reported. This is set up on the Options - GPO screen.

SIGMA 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.

Style 1 Faders

If your console uses Style 1 faders please refer to Appendix A. Style 1 faders have a different button layout, and are slightly different, in the way that the current assignment, interrogated paths and VCA groups are indicated.

Paths A and B

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 in red. 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.

Display Labels

The label in the display is the name associated with the input assigned to the path, or the group number if the path is a group. The input labels default to the Port ID 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. If path A is active, the A fader assign button and the label will be lit in green. If path B is active, the B fader assign button and the label will be lit in amber.

Channel/Group Cut

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.

Assign Button LEDs

A set of indicative LEDs give more information about the path.

- MR - The fader path is a Master of a VCA style group
- SL - The fader path is a slave within a VCA style group
- ST - The path is a stereo channel or group
- SS - The path is a surround master
- GP - A group is assigned to the path
- A - Path A is active
- B - Path B is active

AFL

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.

Null LEDs

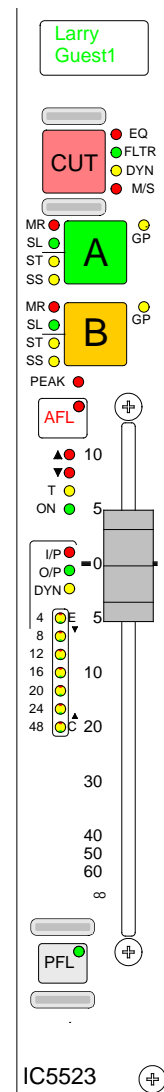
The ▲ and ▼ Null LEDs illuminate when the position of the fader is not the same as the level of the audio. For example, if a VCA master is moved away from the '0' position, the null LEDs on the slaves will light to indicate whether the audio is above or below the position of the fader.

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.

Fader Bargraph

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.

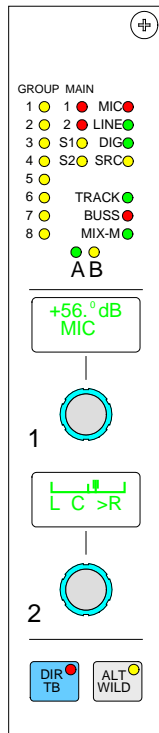


The EQ, FLTR, DYN and M/S LEDs indicate that these functions are active on the selected path (EQ, Filters and Dynamics settings may be flat - LEDs indicate that the function is switched IN).

PFL

PFL will be 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). PFL is also provided on the fader overpress.

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, analog 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
- The active path A or B

Wild Controls

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
- Aux Send Level
- Dynamics
- EQ
- Direct Output Level
- Pan and Balance
- Stereo Width
- 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.

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. It is possible to assign the same control to Wilds 1 or 2 for all fader paths.

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

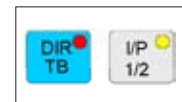
Talkback is available to direct outputs using the DIR TB button. All Talkback buttons are subject to On-Air inhibits, set up on the Options - TX/REH screen.

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.



Input 1 and 2 selection is only operational from this panel when a port is attached to the selected input (unlike selection from the Input/Output panel which is not dependent upon port attachment).

Option 3

If Direct Talkback switching is not required from the fader these buttons can allow Left to Both and Right to Both switching instead.

ASSIGNABLE FADER

The Assignable Fader is positioned towards the centre of the console, in the optimum listening position, and works in parallel with the currently assigned channel or group fader. Alternatively, LOCK FADER allows it to be fixed to a specific path.

The assignable fader can follow a spill fader, but cannot be locked to it. It can however be locked to a surround master.

All A/B Viewing

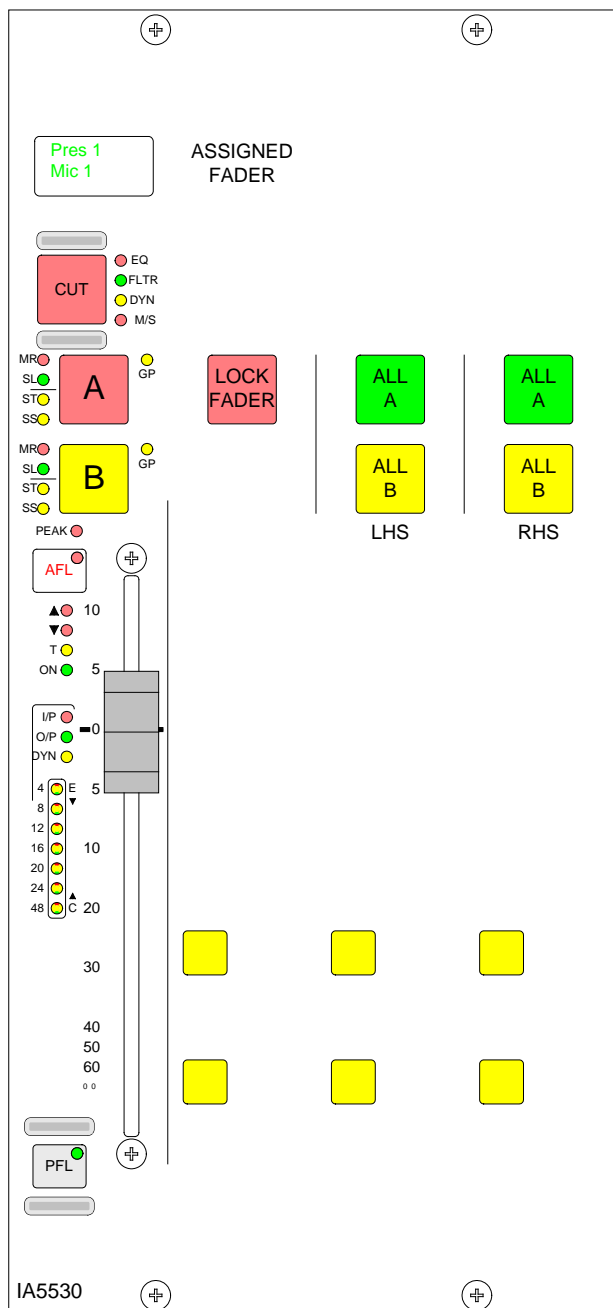
The ALL A and ALL B buttons switch all the channel faders to display either their A path or their B path. Buttons allow the left and right hand side to be switched separately for each path. Using the ALL A and ALL B buttons is like moving to a different section of a single layer design.

Buttons on the Options - Misc screen set the functionality of the All A and All B buttons when using a short press.

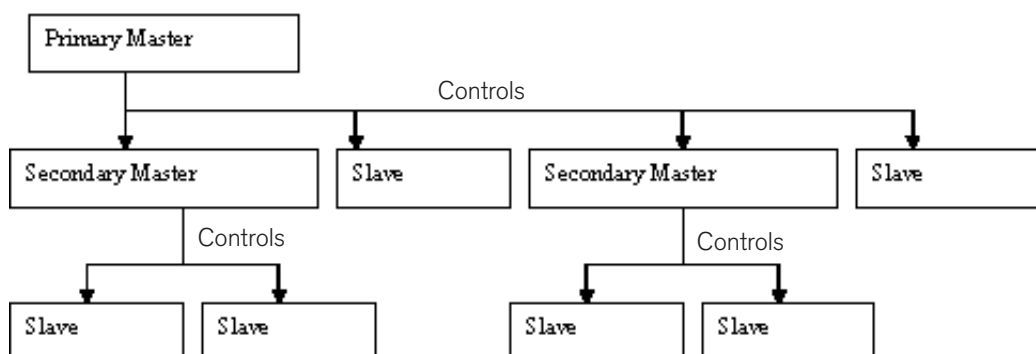
If set to change layer, a short press on the ALL A and ALL B buttons will switch all the channel faders to display either their A path or their B path permanently.

If set to "Latch View", a short press of an All A or All B button will display the paths on the control surface until the button is pressed again. This is so that the console's A/B display pattern is not lost. The console will revert back to the previously displayed layer on each fader.

A long press on the ALL A and ALL B buttons will switch all the channel faders to display either their A path or their B path permanently.



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. There can be up to 48 members of a VCA group.

When the level of the VCA master is adjusted it will change the audio level of all its slaves by the same amount. Changing the CUT, AFL and PFL settings of a VCA master applies the same settings to its 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.

The MR and SL LEDs next to the Assign buttons on the fader strip indicate whether that fader is a master or a slave.

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

Primary and Secondary VCA Masters

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. A secondary master fader has both the MR and SL LED lit.

It is possible to create the primary or secondary group in any order. A slave can

be made into a secondary master by adding slaves to it. If a slave added to the VCA group is already a master it will become a secondary master.

5.1 Surround Channels

If a surround master is part of a VCA group then the VCA primary and secondary master levels, cut settings and APFL settings affect all of its spill legs. It is not possible for the spill faders themselves to be masters or slaves of a VCA group.

VCA Group Interrogation

Interrogation provides a clear way of indicating VCA group assignments. When the fader assign button of a VCA group member is held down, the fader assign buttons of all members of the same group will be lit, and the fader assign buttons of paths which are not part of the group will cease to be lit.

Interrogation of a Primary Master will light the fader 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.

AUTOMATIC CROSS-FADING

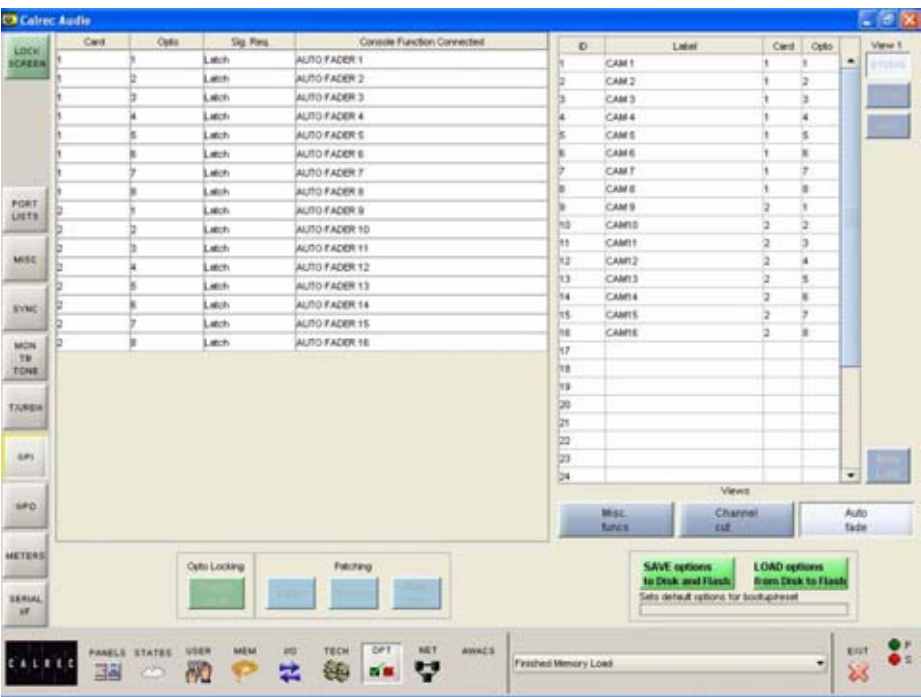
This feature allows the user to automatically fade channel and group faders in or out under the control of an external signal. Cross-fades may be achieved by driving two or more optos with one fader being faded out while a second fader is being faded in.

Assigning Auto-Faders to Opto Inputs

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.



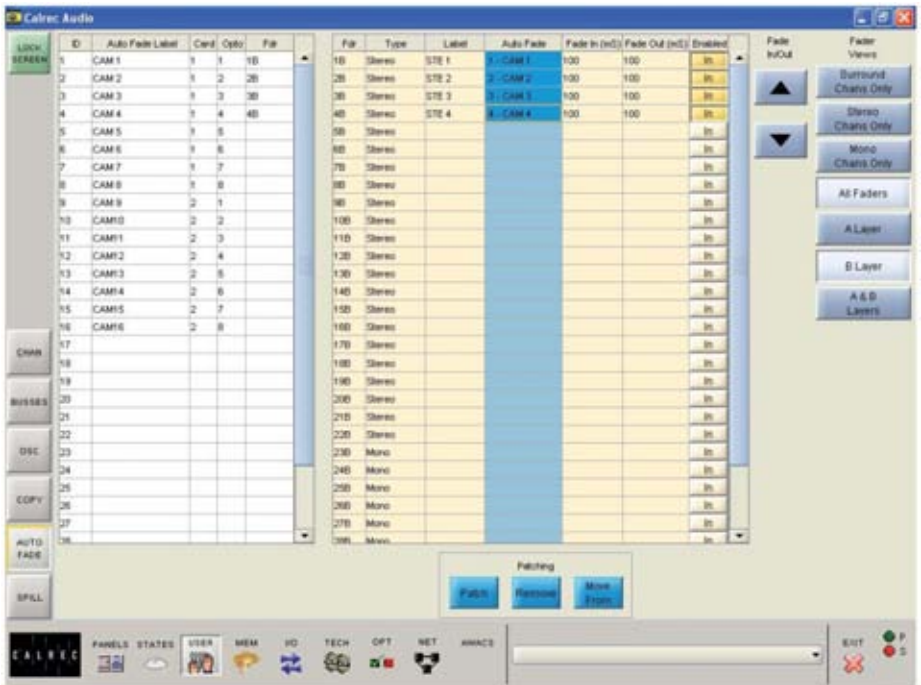
Auto-Fade Screen

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.

The user can enable and disable each autofader by selecting the Enabled IN column.

5.1 Surround Channels

If an auto-fader is assigned to a surround master the auto fader function acts on all its spill legs. The auto fader settings are stored with the surround master's path number. The status of the auto fade is shown on both the surround and spill fader's NULL LED's. If an auto fade is unassigned from a surround path all the spills are faded up.

Indication of an Auto-Fade

Indication of an auto fade is provided by illuminating the fader's down NULL LED when the path is, or is currently being, faded out. If the current physical position of the fader is OFF then this will not apply. The down NULL LED will revert back to its original state as the path is faded back to its

current position. If the path's fader is also a VCA master, the NULL LED operates only if the fader is in VCA interrogate mode thereby exposing the status of the slaved path.

LAYER LOCKING

Each fader can be locked to always display either its A or B layer. When a fader is locked to an A or B layer, the unwanted A or B layer button is disabled and the fader is isolated from any ALL A or ALL B switching.

Enabling layer locking

To enable layer locking navigate to the Options - Misc screen.



Locate the Layer Lock option and ensure the ENABLED button is selected.



Defining locked layers

To choose which layers are locked to which faders, navigate to the User - Layer Locking screen.



You will be presented with a list of all faders on the surface which can be filtered using the Fader Views buttons to the right.

To lock a layer to a fader, press the relevant blue assignment button in the 'Lock Assigned' column. This will change to a yellow 'Locked' button to confirm the assignment.



Multiple cell selection

To select multiple cells and simultaneously assign a layer lock, press the 'Start Cell' button.



Select' button. This allows you to click and drag over multiple lock assignment buttons. Selected buttons will be highlighted with a black border.

faders to the A layer or B layer or remove all layer locks respectively. Press the 'Clear Selected Cells' button to remove the multiple cell selection.



With multiple cells selected, pressing either the 'Lock A Layer', 'Lock B Layer' or 'Unlock' buttons will lock all selected

SIGMA

5.1 SURROUND

5.1 SURROUND CHANNELS

5.1 Surround channels provide the ability to control a discrete 5.1 source as a single channel. The system can have up to 52 surround channels. A surround channel consists of a surround master and the paths which are used to construct it.

Creating a Surround Channel

The surround button on the I/O Matrix is used to create a surround channel on the currently assigned fader.

When this happens, the currently assigned fader becomes a surround master, and the assign panels show and allow adjustment of the surround master settings. The surround master holds the master control settings which affect the operation of the surround channel.

Each 5.1 surround channel uses the resources of 2 mono channels for Centre and LFE; and 2 stereo channels for L/R and Ls/Rs. These resources are allocated as the surround channel is assigned, from the available mono and stereo channels.

Surround Spill

A set of screens are provided, to control the individual legs of surround channel, group or main paths. In addition, an optional surround spill panel is available so that adjustment can be made from the control surface.

When a surround path is selected as the currently assigned fader, the spill panel becomes active and displays the information for each of its spill legs, and the spill faders allow their level to be adjusted.

Each spill fader has its own assign button, which is used to select the spill leg as the currently assigned path when the spill panel is active. The spill's assign button lights when selected, and its surround

master's assign button will flash. When a spill leg is selected as the currently assigned path, the assignable panels show and allow adjustment of its settings.

If a surround path is routed to a stereo bus or meter, a stereo down mix is created. When the down mix button on the spill panel is selected and the destination is a stereo group or main output, the spill faders will switch to allow adjustment of each individual spill paths contribution to the down mix. Other fold-downs, for example a stereo mix minus are not affected by the spill faders and are pre set with the following parameters.

Spill Path	Level (dB)
L/R	-4.5
C	-7.5
Ls/Rs	-10.5
LFE	Off

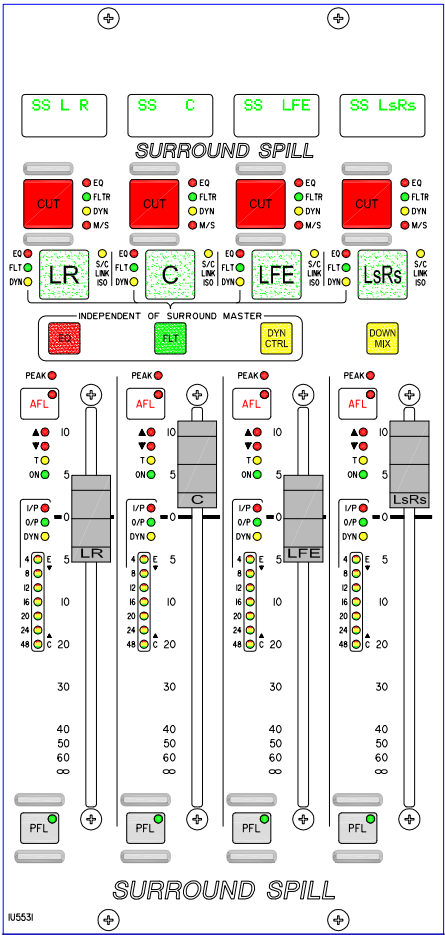
The surround master level controls for input gain, fader position, direct output, aux send and track send, act like VCA masters of the spill leg controls. With a surround master selected, the balance control on the Input/Output panel acts as an input gain trim control.

The assignable fader can follow the spill fader, but cannot be locked to it. It can however be locked to a surround master.

Input Patching

For channels, inputs are patched to the spill legs and not to the surround master channel. When an input is patched to a spill leg its input settings (SRC, Phantom Power) are selected individually for each spill leg.

If a stereo or mono channel uses the same input port as a spill leg, and phantom power or SRC is selected or de-selected



on that path, this would then change the status of the surround channel and all its spills.

Each spill follows the Input 1,2 setting of the surround master. They cannot be switched individually.

Mic Open System

When a port, which is assigned to a mic open buss (On the Options - Port Lists screens), is patched to a surround spill leg, the mic open circuit will operate when that surround spill leg is faded up and routed to the program output. The system takes into account the routing and fader status of both the surround master and its spills, as both will have an effect on the open path.

Independent Spill Path Control

When a surround master is selected as the currently assigned fader, the spill panel will become active and display the information for each spill leg of that surround channel. When a spill leg is selected using its assign button, settings can be adjusted for just that leg of the surround channel. Some settings however, are only adjustable using the surround master, unless the spill path is made independent.

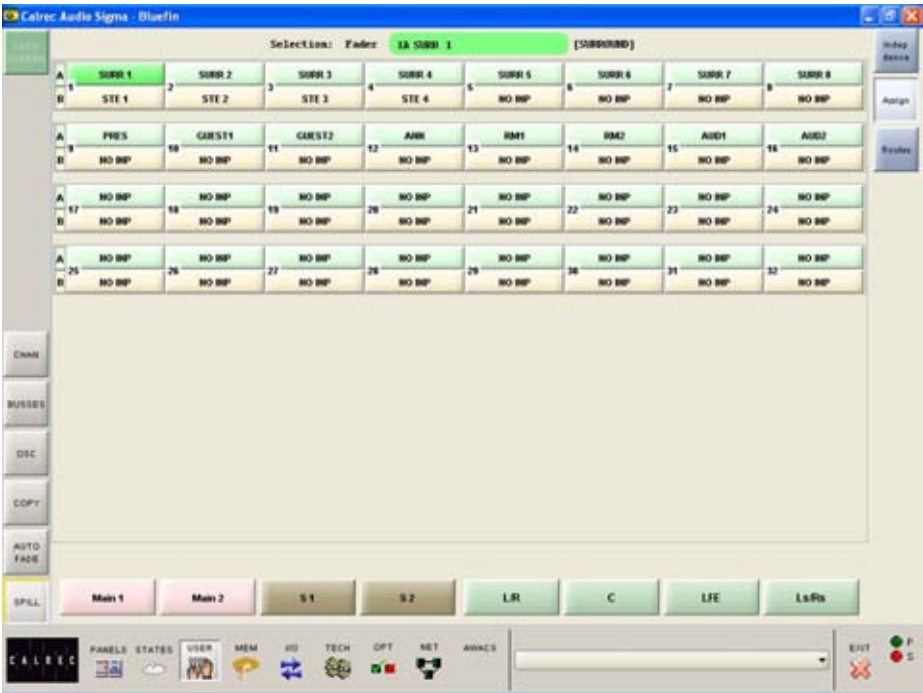
Normally, settings for EQ, filters and dynamics applied to the surround master affect all the spill legs except LFE. The LFE spill leg controls its settings independently of the surround master.

The EQ, FLT and DYN CTRL buttons on the surround spill panel light when selected, and are used to allow the currently assigned spill leg to control EQ, filters and dynamics independently of its surround master. LEDs next to the spill path's assign button indicate which functions are independent.

If the spill path is made independent, it retains the existing master settings until its own buttons or shafts are operated. If the EQ, FLTR or DYN buttons are de-selected, making the spill non-independent, the spill will immediately adopt all the same settings as the master control.

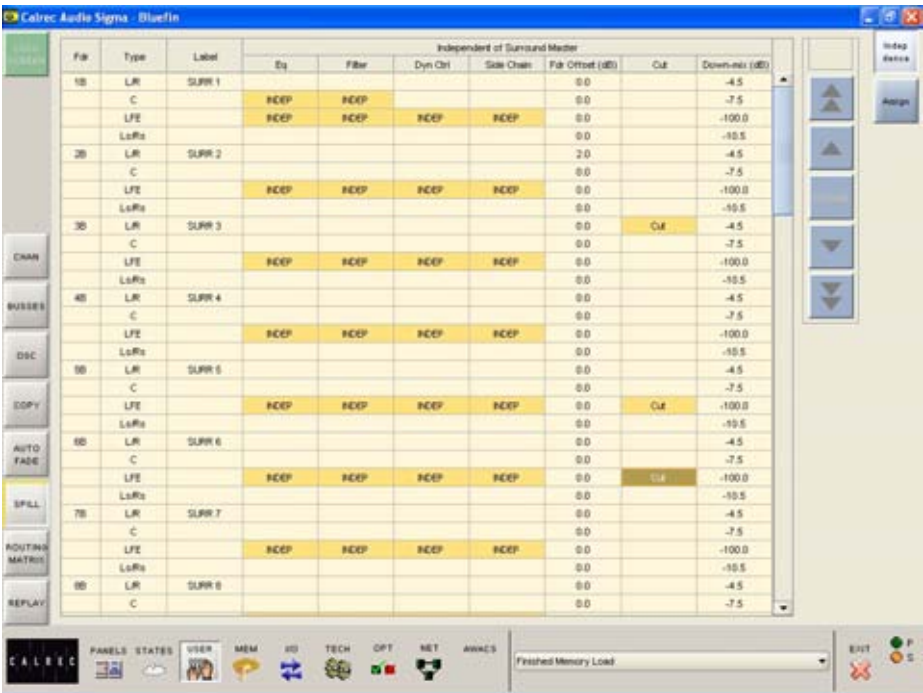
User - Spill Assign Screen

This screen provides alternative selection controls for the surround channels, groups or mains and their individual spill paths.



Spill Independence Screen

Independence can also be activated for the spill paths of each surround channel using the User-Spill screen, by selecting the relevant cells. The fader level can also be adjusted from here, by selecting the required cell in the FDR OFFSET column, and using the nudge buttons.



POINTS TO REMEMBER

Dynamics Linking

There are 2 desk wide user dynamic link busses. Each surround channel or group has its own dynamic link bus.

When a surround channel is created the surround master and all its spills except the LFE are associated with the surround channel's dynamic link bus. The LFE is not linked and its settings are independent of the surround master's.

In normal operation, if a surround master is assigned to a dynamic link bus using the link buttons on the dynamics panel, all of its spill legs will also join the same dynamic link bus. It is possible however, to make each spill leg independent of its master's link bus, so that it can be linked to a different bus. Independent spill legs do not change if the surround master's link bus settings are changed or removed.

The dynamic link or "side chain" independence of the assigned spill fader is toggled using the User-Spill screen. It can also be toggled by pressing and holding down the link 1 or 2 button then pressing the other link 1 or 2 button. If a spill path's dynamic link is independent of the surround master's then when the spill is visible on the spill fader panel, the S/C Link ISO LED is lit.

If a spill path's dynamic link bus independence is removed, it is immediately linked to the same dynamics bus as its surround master.

On the surround master, the link button LED's show which user dynamics link the surround master is routed to. The OFF button's LED is lit when the master is not linked to any of the four user busses.

Alternate Equaliser and Filters

When the surround master is switched to the alternate EQ and filter settings, the same settings are applied to any non-independent spill paths. The spill paths cannot use the alternate EQ and filter settings independently of their surround master.

VCA Groups

If a surround master is part of a VCA group then the VCA primary and secondary master levels, cut settings and APFL settings affect all of its spill legs. It is not possible for the spill faders themselves to be masters or slaves of a VCA group.

APFL, Tone and Channel Cut

Each spill leg can select APFL, tone and CUT independently, but cannot select or deselect any of these when they are switched on using the surround master.

The surround master follows the tone inhibit selections on the Options - TX REH screen. The spill legs follow the inhibits via the surround master only, not individually.

An opto can remote cut a spill leg, but not a surround master.

Pre/Post Selections

A surround master's pre/post selections for inserts, direct outputs, aux sends, tracks, mix minus and dynamics forces all its spill legs to that setting, but the spill legs can then adjust these individually.

SIGMA

INPUT AND OUTPUT CONTROLS

I/O MATRIX

The I/O Matrix provides a set of input and output controls. It allows ports to be assigned to channel inputs and channel and group direct outputs. It allows path type selection and path operations to be carried out. Inserts can be assigned to channels and groups using these controls.

Input Port Assignment

Ports are assigned to inputs 1 and 2 for the currently assigned fader 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 - that is done using the Input/Output panel)
- Use the rotary control to scroll through the lists of available input ports.
- Upon reaching the desired port, press the ON button to assign it to the input 1 or 2 for the currently assigned fader path.
- Pressing ON again will de-assign the port.

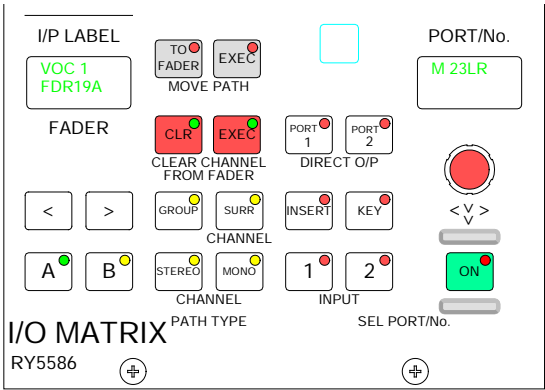
Port assignment can also be done using the I/O screens.

Lists

Pressing and turning the rotary control gives access to lists of other types of port. Using the Options - Port List screens, 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 ports appear for selection on the I/O Matrix panel using the Options-Port Lists screens. Making only the relevant lists available for selection makes it easier to find the ports you require.

Path Type Selection

The GROUP, SURR, STEREO and MONO buttons select the path type for the currently assigned fader. If the path is to be a group, its number is selected



using the rotary control and ON button. Groups are defined as surround, stereo or mono on the USER-BUSSES screen. The path type and group number can also be selected using the USER-CHAN screen.

Move Path and Move Strip

Paths can be moved or swapped from one fader to another, using the MOVE PATH buttons. 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.

A surround master can be moved from path to path, but it is not possible to move a spill leg to another fader. It is not possible to move an isolated path.

The USER-CHAN screen can also be used to move paths. In addition, the whole fader strip can be moved to a different fader. This means that the A and B paths including any Wild Assignments will move to the selected destination fader strip. The Move Path function on the I/O Matrix can be set to always perform Move Strip using the States screen.

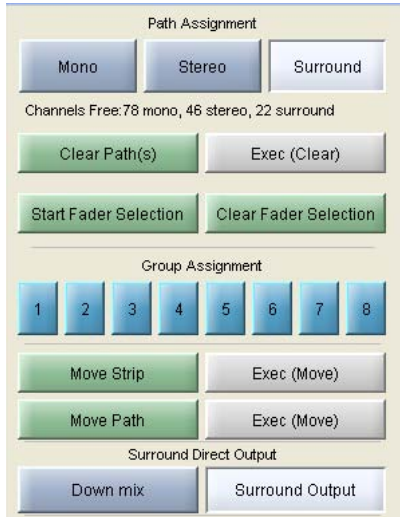
Clearing Paths

Channels and groups can be cleared off the fader by pressing CLR and then EXEC. This will clear all settings and port

assignments from the fader path (A or B). This function is also available using the USER-CHAN screen.

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.

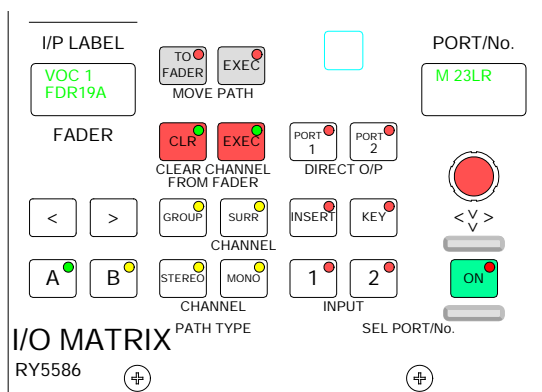


Direct Outputs

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 released.

Direct output port assignment can also be done using the I/O screens.



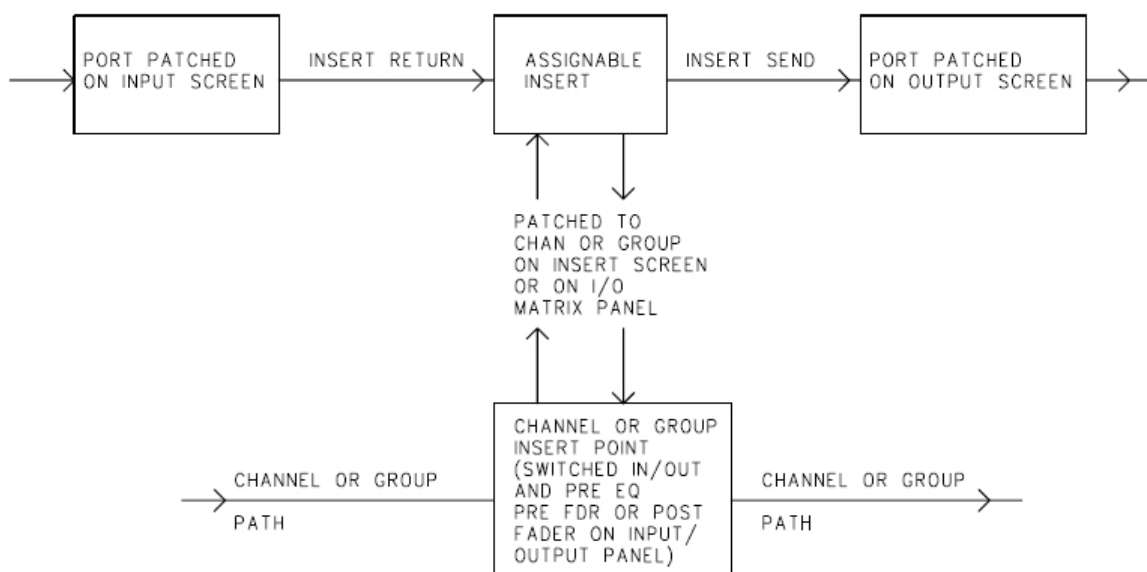
Channel and Group Inserts

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 I/O 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 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 on this panel allow separate settings for the two channel inputs; and gain and ON/OFF for the group and main direct inputs.

Input Settings
Gain Adjustment
Balance Control
Width Control
Inserts
Direct Output and Mix Minus
Stereo and Surround Panning

Input Selection Controls

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.

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. Optionally, each fader can have dedicated selection buttons for LB and RB on its channel control section.

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 input. ØL is used for mono channels.

TONE switches tone to the input of the currently assigned channel or group from where it can be routed as required.

Gain Adjustment

Comprises 2 buttons for coarse ranging, and a rotary control 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 the change in gain of one input is applied to both inputs. The lower and upper level endstops still apply, and are dependent upon the input type. If one

of the inputs reaches an endstop during adjustment, this will stop both gains going any lower or higher. The gains are linked by pressing the input 1 and 2 buttons simultaneously. This behaviour is enabled using the STATES screen.

Balance Control

Operates as a balance control on stereo channels only. With LB or RB selected, this control acts as an input pan control. With a surround master selected, this control acts as an input gain trim control.

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.

Inserts

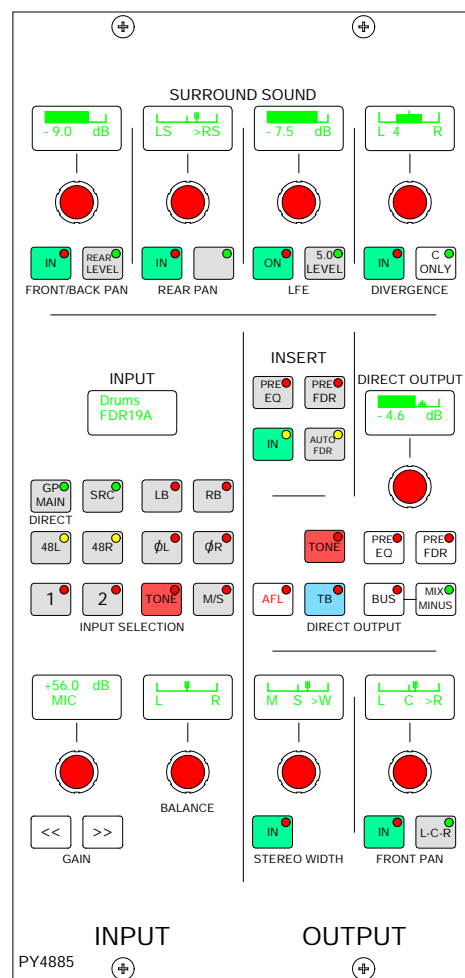
Assignable inserts can be patched in and out of the channel path, using the IN button. The buttons allow the insert to be patched post fader, pre fader or pre EQ. Assignable inserts must first be set up using the I/O Matrix or I/O screens.

Enable Auto Fader

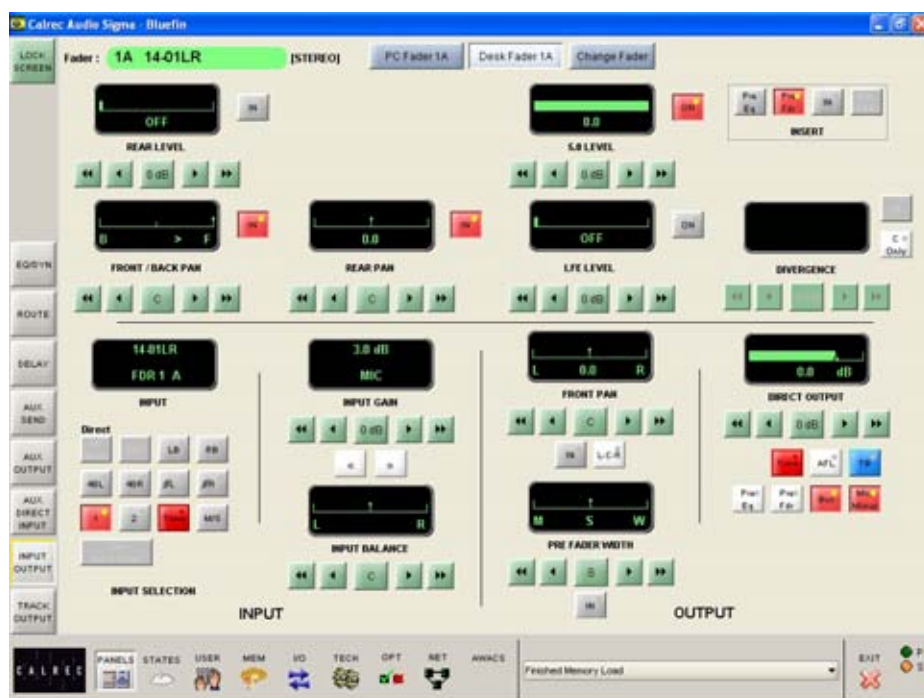
With AUTO FDR selected, the Insert IN button is used to enable or disable the currently attached auto fader.

Panels - Input Output Screen

The Panels - Input Output screen duplicates some of the controls on the Input/Output panel. In addition, the



user can choose whether to control the currently assigned fader path, or to select a different fader, known as the “PC Fader” to which settings can be applied independently of the current assignment. Control is chosen using the selection buttons “PC Fader” and “Desk Fader”



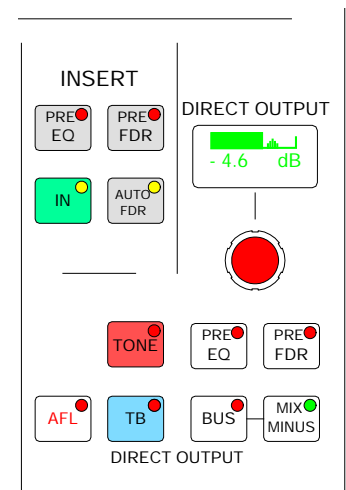
DIRECT OUTPUT AND MIX MINUS

Every channel and group can produce a direct output simultaneously. 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.

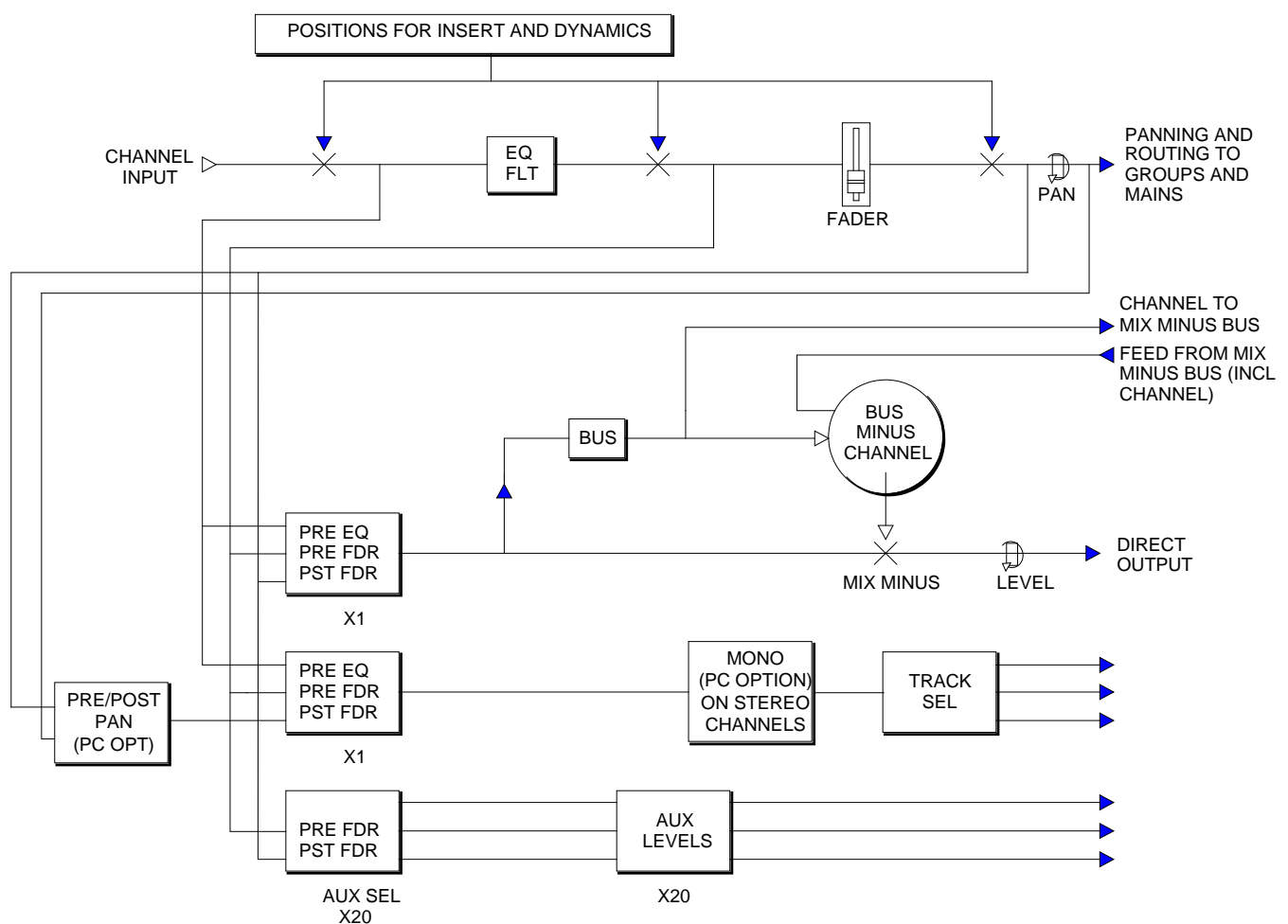
BUS feeds the direct output signal to the mix minus bus. The output of the mix minus bus feeds back into the channel (or group) where the channel's signal is subtracted. The MIX MINUS button then feeds the resulting signal to the direct output.

Therefore, every channel can produce a mix minus output which is a mix of all the channels routed to the bus apart from itself. MIX MINUS and BUS are independent buttons, so the track routing selector and the direct output can be fed with the mix minus bus, even if the channel is not feeding the bus.

All surround channels and groups have surround direct outputs with the option to downmix the output to stereo instead (on the User-Chan screen). The mix-minus of a surround direct output is a true mix-minus of the whole surround channel or group.



SIMPLE CHANNEL SCHEMATIC



(920-625)

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

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.

Front Pan

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

Front/Back Pan

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 separately. 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.

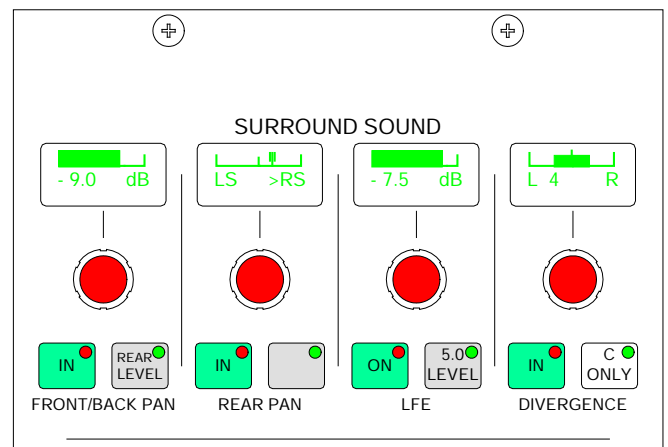
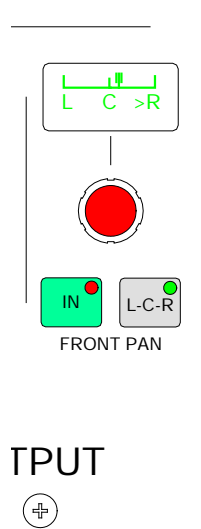
Rear Pan

The Rear Pan allows the rear signal to be panned from Ls to Rs.

LFE and 5.0 Level Control

The LFE ON button allows the rotary control to adjust the level of the LFE independently of the rest of a surround signal.

With 5.0 LEVEL selected, the control adjusts the level of all the surround legs except for the LFE. The 5.0 level is independent of the LFE level.



Divergence

On mono channels, the divergence control sets an amount of the centre signal to also feed to the left and right.

Divergence is switched in, using the IN button.

The divergence control on a stereo channel determines its left, centre and right contribution to a surround path.

When the divergence shaft is fully anti-clockwise the signal will be present only in the centre, and "MONO" is shown in the display. The pan control balances the mono mix of left and right into the centre.

As the divergence shaft is rotated clockwise the level of audio in the left and right increases and the level in the centre decreases. The display shows a bar of increasing width. Adjusting the pan control shall balance the left and right mix to the centre, and simultaneously balance the left and right audio.

When the pan shaft is fully clockwise the signal will be present only in the left and right, and "STEREO" is shown in the display. The pan control acts as a balance for the left and right levels.

The overall audio level reduces as the pan position approaches the centre.

When LCR is switched out the divergence in of a mono channel is switched out.

C Only

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.

MOTORIZED JOYSTICK PANEL

The motorized joystick panel can be either a single joystick, or twin joysticks. The joysticks are touch-sensitive, and the TOUCH LED lights when the joystick is touched.

The joysticks allow accurate stereo and surround panning of channels, groups or mains. Please note that the joystick is unavailable for use on 5.1 surround channels and groups; or their spill legs.

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.

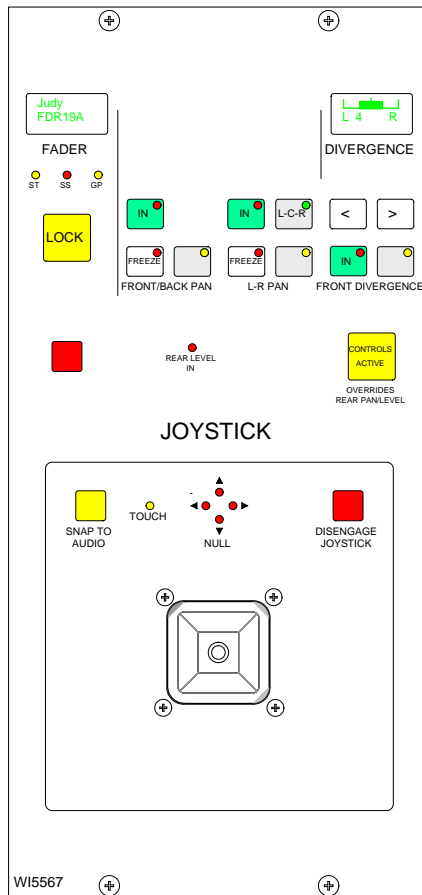
- ST - Indicates a stereo source
- SS - Indicates a 5.1 surround main
- GP - Indicates a group

Front/Back pan, L/R Pan and Front Divergence each have a set of dedicated controls. Each has an IN button to enable the function. The IN buttons and L-C-R button work in parallel with the buttons on the Input/Output panel.

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, 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.

DELAY

These controls allow specific amounts of delay to be applied to the currently assigned channel path. 256 mono legs of delay are available for inputs and 128 mono legs are available for outputs, each providing up to 2.73 seconds of delay. Stereo paths use two legs, and surround paths use 6 legs. Delay can be assigned in the following places:

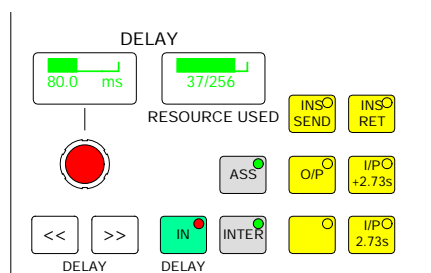
- Either or both channel inputs (1 & 2)
- Channel, group and main insert sends
- Channel, group and main insert returns
- A second leg of delay on either or both channel inputs (allows up to 5.46 secs)
- Channel and group direct outputs

In addition, group inputs each have 2.73 seconds of delay permanently allocated.

Assigning Delay

Select the path either by pressing its fader assign button or by selecting it from the screen. The yellow selection buttons allow the user to specify where the delay will be assigned. The delay value is adjustable in 0.1ms steps using the rotary control, and 10ms steps using the nudge buttons.

The ASS button is used to assign the delay, and the IN button switches the set value of delay in and out of the path.



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 on the screen.

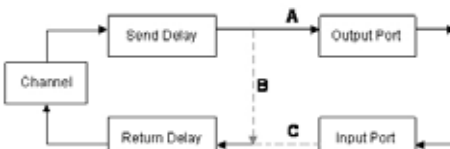
Delay on Surround Channels

On 5.1 surround channels, delay is assigned and adjusted using the surround master. Each spill leg of a surround channel will always have the same delay properties. The delay settings of an individual spill leg can not be assigned, adjusted or cleared independently of its surround master.



Insert Send/Return Delay

The delay in the Insert Send and Return paths can be used in the channel as extra delay (in addition to Input Delay) by assigning an insert to a channel and having the insert NOT switched IN. In this case, the audio follows path B in the diagram. With these settings, an output port patched to the Insert Send will follow the Send Delay (path A).



Switching the insert IN replaces path B with path C and the return audio is from the input port patched as Insert Return.

With delay assigned to both Send and Return it is possible to have up to 5.46 seconds of extra delay in the path.

Interrogation

Holding down the interrogate button will indicate the channels which have delay assigned by lighting their fader assign buttons. It is not possible to perform interrogation from the screen when controlling a "PC Fader".

Panels - Delay Screen

The Delay screen provides a set of delay controls on the screen in addition to those on the control surface.



In addition, the user can choose to control a different fader, known as the "PC Fader" to which settings can be applied independently of the current assignment. Control is chosen using the screen's selection buttons.

PAL Frames, NTSC Frames or ms

The selection buttons on the Panels - Delay screen allow the information to be displayed in ms, PAL frames or NTSC frames. Changing the display units changes the resolution of the delay shaft, nudge up and nudge down buttons accordingly. Display units are not adjustable on the control surface.

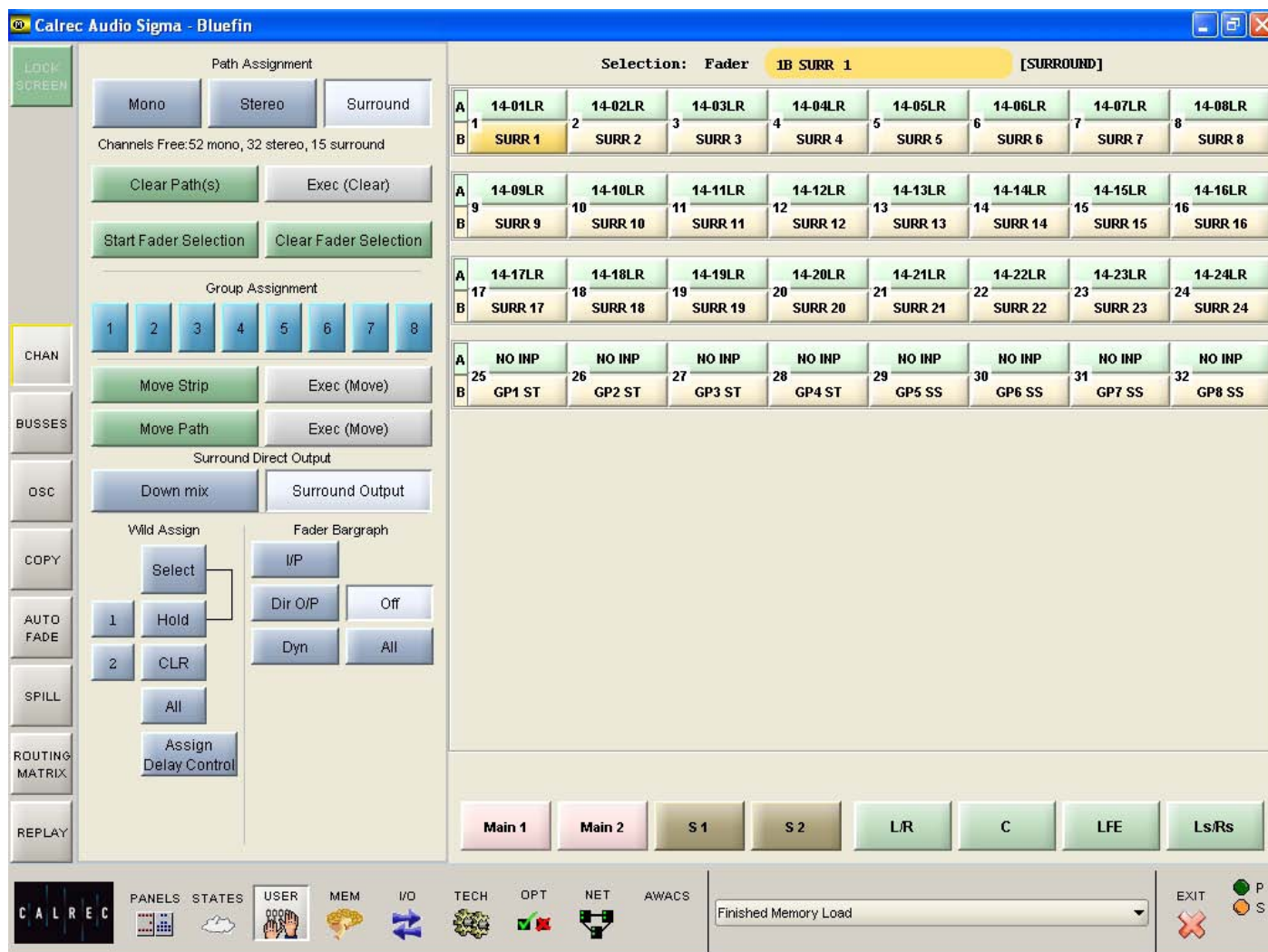
Wild Control Delay

Delay controls can be assigned to Wild controls, such that the delay value can be adjusted using the channel control module. If the wild shaft push feature is enabled on the Options-Misc screen, then the wild delay control shaft can be used to switch the delay in and out of the channel's path.

Delay can also be assigned to Wild controls using the User-Chan screen. A screen button is provided, for use instead of the rotary control push-switch.

SIGMA CHANNEL FUNCTIONS

USER-CHAN SCREEN



This screen provides controls for channel functions, some of which are available on the control surface. 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 Selection

The MONO, STEREO and SURROUND buttons here select the path type for the currently assigned fader. If the path is to be a group, its number is selected using buttons 1-8. Groups are defined as surround, stereo or mono on the USER-BUSSES screen.

Clearing Paths

To clear a path, select the assign button of the path you wish to clear, and select CLEAR PATH and then EXEC. "Start Fader Selection" allows a number of fader paths to be selected, either from the screen, or by selecting their fader assign buttons. In this way, a number of fader paths can be cleared in one operation. Multiple fader selection can also be used to allocate a path type to several paths at once. The multiple fader selection can be cleared using "Clear Selection".

Move Path and Move Strip

Paths can be moved or swapped from one fader to another, using the MOVE PATH buttons. Select the required path, and select MOVE PATH (the assign button will flash). Then select the destination fader path, and select EXEC (Move). The two paths will swap over, and any Wild control assignments will move with them.

MOVE STRIP moves the whole fader strip to a different fader. This means that the A and B paths including any Wild Assignments will move to the selected destination fader strip.

Surround Direct Output Downmix

All surround channels and groups have surround direct outputs. The buttons on this screen allow the user to choose the full surround direct output, or to downmix the output to stereo. When the downmix button on the surround spill panel is selected the spill faders will switch to allow adjustment of each individual spill paths contribution to the downmix.

Fader Bargraph Assignment

Buttons I/P, DIR O/P, DYN and OFF on this 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 function.

Wild Control Assignment

The Wild controls above each fader are assigned from this 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
- Select WILD ASSIGN 1 or 2
- Push one Assign panel rotary control

The control is now assigned and changes will show in the display. The Wild controls "FLIP" with the fader, providing the same function for each of the two paths. The colour of the Wild control display will show which fader the control is related to: Green for A, Amber for B.

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 separately 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. Any number of fader paths can then be selected individually (their fader assign buttons 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. 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 1 and 2 for all fader paths by selecting ALL before pushing the required Assign panel rotary control.

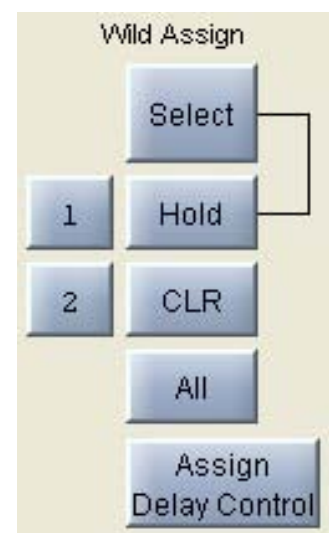
If the track output level control is assigned to a block of wild controls, each fader's wild control will have a different numbered track output level control, beginning with the track currently selected on the first fader in the block.

Wild Control Push-Switch Option

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

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.



EQ AND FILTERS

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

Once a channel has been selected by pressing its Assign button (A or B), its frequencies can be adjusted using the following controls.

Filters

LF Flat then 20Hz to 330Hz
12dB/octave

HF 3.3kHz to 20kHz then flat
12dB/octave

The console LFE path is a full bandwidth one, but when necessary a low pass filter can be applied to any LFE leg via the spill panel. Typical frequency choices might be 80Hz or 120Hz but a wide range is available.

HF 50Hz to 20kHz then flat
12dB/octave

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

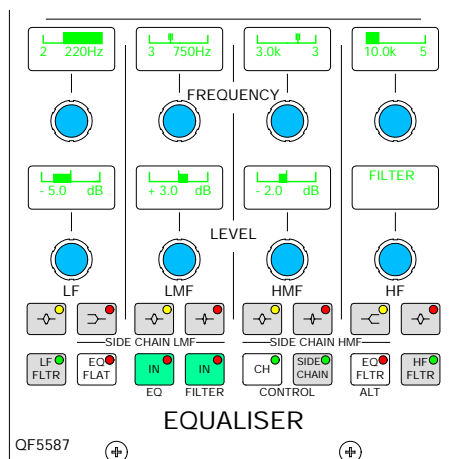
HF 1kHz to 16kHz, shelf or bell
(Q of 1.5)

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

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

Control Assignment

The CH button allows the panel to control the EQ and Filters in the assigned channel's path. The SIDE CHAIN button allows the panel to control the EQ and Filters in the dynamics of the assigned channel. There are 4 bands of EQ



permanently available in the side chain in addition to the 6 bands available for channels and groups.

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.

Panels - EQ/DYN Screen

The user can view and manipulate the EQ and filter response curves, using the Panels-EQ/DYN screen.



All of the controls available on the EQ panel are also available on this screen. In addition, the user can choose whether to control the EQ and filters of the currently assigned fader path, or to select a different fader, known as the "PC Fader" to which EQ and filter settings can be applied independently of the current assignment.

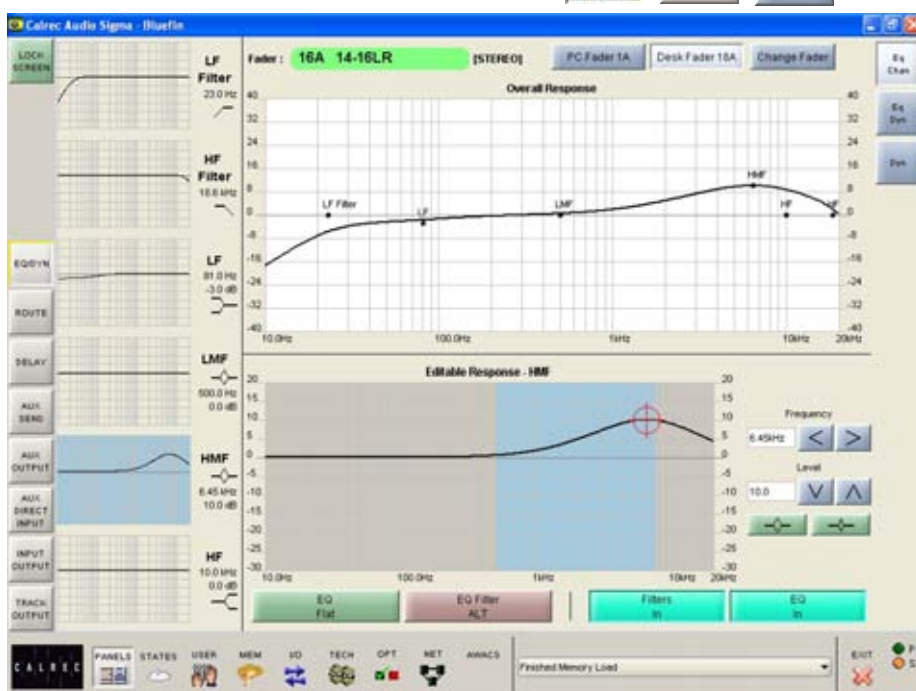
The required band is selectable from the left side of the screen. When selected, that band's response curve is shown in the Editable Response window, with the adjustable area highlighted in blue.

Its frequencies can be adjusted using the touch screen, or trackball, by selecting the crosshair and moving it around within the editable area.

As it moves, the frequency and level values of the selected path (or PC fader path) will change. Nudge buttons to the right of the editable response window can also be used to make adjustments.

The overall response window shows the overall response curve for the selected path. The curve itself is only visible if EQ is switched into the path.

A similar screen exists to adjust the EQ if it is switched into the dynamics.



The Dynamics controls adjust the compressor and expander or gate on channels and groups, and the compressor and expander 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 its Assign button (A or B), its dynamics can be adjusted using the following controls.

Compressor

Threshold: +20dB to -20dB

Recovery: 75ms to 4 sec + AUTO
(Max clockwise setting)

Ratio: 1.0:1, 1.3:1, 1.5:1, 1.7:1, 2.0:1, 2.5:1, 3.3:1, 5.0:1, 10:1, 50:1 (Limiter).

Attack: 30ms (Fast Attack: 250µs)

Soft knee (on channel paths only)

Sidechain Listen

The sidechain listen facility allows the user to listen to the signal driving the compressor sidechain. This allows the effect of sidechain EQ to be “previewed”.

Expander

Threshold: 0dB to -40dB

Recovery: 75ms to 4 sec + AUTO
(Max clockwise setting)

Depth: 0dB to 40dB

Fast attack: 300µs (normal 16ms)

Ratio: 2/1 or SOFT

Gate

Threshold 0dB to -40dB

Recovery 75ms to 4 sec + AUTO

Depth 0dB to 40dB

Fast attack 300µs (normal 16ms)

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

Dynamics Linking

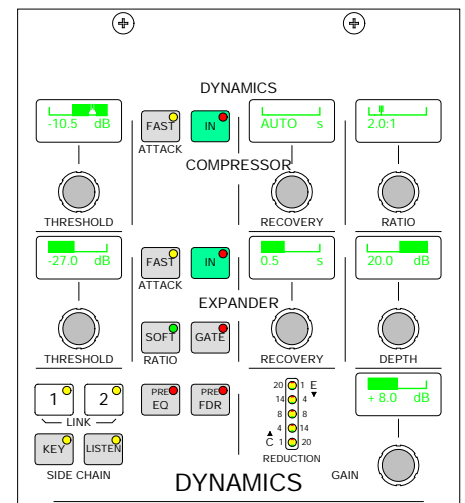
It is possible to have the dynamics of many channels linked by assigning them to one of two available link busses. This is useful for when the same dynamics settings need to be applied to more than one channel. With the channel selected, press Link 1 or 2 to assign the channel to the bus.

Panels - EQ/DYN Screen

The user can view and manipulate the dynamic response, using the Panels-Dynamics screen. All of the dynamics controls available on the control surface are also available on this screen.

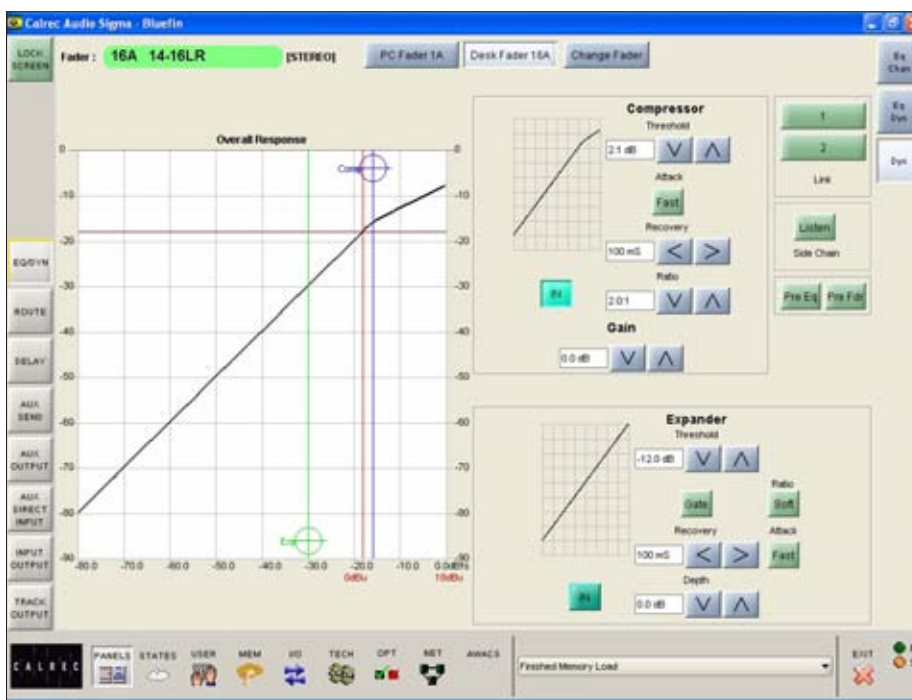


In addition, the user can choose whether to control the dynamics of the currently assigned fader path, or to select a different fader, known as the “PC Fader” to which dynamics settings can be applied independently of the current assignment.



Compression or expansion settings can be adjusted using the touch screen, or trackball, by selecting the required crosshair and moving it around within the editable area. As it moves, the values will change. Nudge buttons to the right of the editable response window can also be used to make adjustments.

The dynamics response is only visible if dynamics is switched into the path. Otherwise, it remains flat.



CHANNEL COPY

Nine sections of a channel or ALL together can be copied to another channel or channels using the User-Copy screen.



First select the fader path you wish to copy, by pressing its fader assign button.

Select the controls you want to copy, using the selection buttons I/PS, EQ, FLTR, DYN, PAN, FDR, RTG, AUX, WILDS or ALL.

Press TO FADER (flashes) then select the required destination/s. Destinations can be chosen by selecting fader assign buttons, or using the ALL A or ALL B buttons. In addition to any multiple destinations set, an individual destination can be chosen using the nudge buttons and the keypad on the I/O Matrix panel.

Once all destinations have been chosen, the EXEC button executes the Copy.

Any groups or main outputs included in the selected destinations will be ignored.

Copy Options

I/PS copies LB, RB, ØL, ØR, M/S and balance settings (only Ø 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.

Copying Surround Channels

If a surround channel is copied to stereo or mono channels, or a stereo channel's settings are copied to mono channels, only the relevant settings are copied. Other settings will be reset to the cleared down state.

If the source fader is a surround channel and the destination is a surround channel the appropriate settings of the surround master and all its spills are copied, Master to Master and spill to corresponding spill. Groups or surround groups cannot be copied.

If the source is a stereo or mono channel and the destination is a surround master the master receives the copied settings and then applies them to all its non-independent spill legs.

Surround spill paths cannot be copied independently of their surround master, and it is not possible to select a spill fader as the destination for a channel copy.



BROADCAST FACILITIES

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

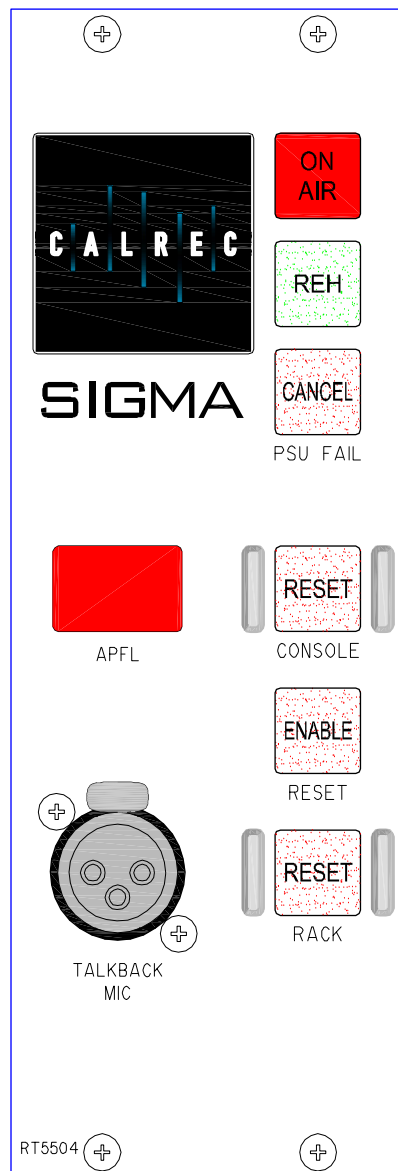
Pressing the ENABLE and CONSOLE RESET button resets the Control System only. Independent DSP operation ensures audio continuity during console reset. The most recent console settings will be fully restored in less than 15 seconds.

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.

Rack Reset

Pressing the ENABLE and RACK RESET button resets the racks only, the control surface is unaffected.

Please Note: Resetting the racks will result in a brief audio interruption.



Power Supply Monitoring

The rack mounted PSU and distribution 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.

The PSU Fail Indicator can be set to flash whenever an AWACS error or warning message is reported. This is done using a general purpose output, set up on the Options - GPO screen.

USB

Some consoles may be supplied with a panel having the optional USB port (not shown alongside). This is a USB 1.1 port, provided primarily for connecting flash memory devices for loading and storing settings. The small size of console memory files means data speed is not normally an issue. The port may not be appropriate to supply the higher current demands and other needs of hard disc drives and other devices.

CONSOLE FUNCTIONS

The console function buttons provide an easy way of changing channel or global console settings.

These buttons 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.

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.

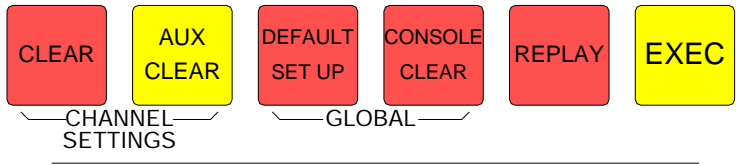
Default Setup

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

Activates Replay mode, causing all channels selected for replay to switch to input 2. When Replay mode is active, the button will be lit.

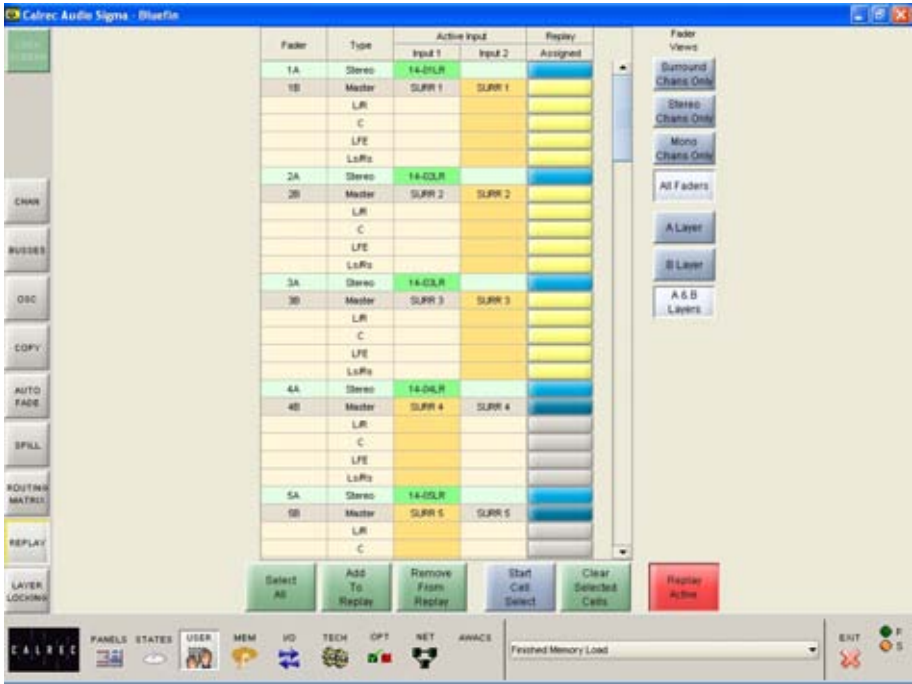
Channels are selected for replay on the User-Replay screen, by selecting the relevant cell in the "Assigned" column. The cell will change colour to show that assignment is made.

The User-Replay screen also has a button with which Replay mode can be activated.

If a surround channel master has the replay function assigned then the replay function shall be assigned to all its spills. It is not possible to assign the replay function to individual spills of a surround channel independently.

Replay selections are stored with user memories. Partial memories restore the channels inputs and replay assignment (unless isolated) but the current replay state shall not be restored.

Many channels can be added to or removed from replay at once, by selecting "Start Cell Select", and then choosing a number of channels. Once selected, "Add to Replay" and "Remove From Replay" will add or remove those channels from the replay selection.



SIGMA BUSSES

ROUTING AND TRACK OUTPUT CONTROLS

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. 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.

Track Output

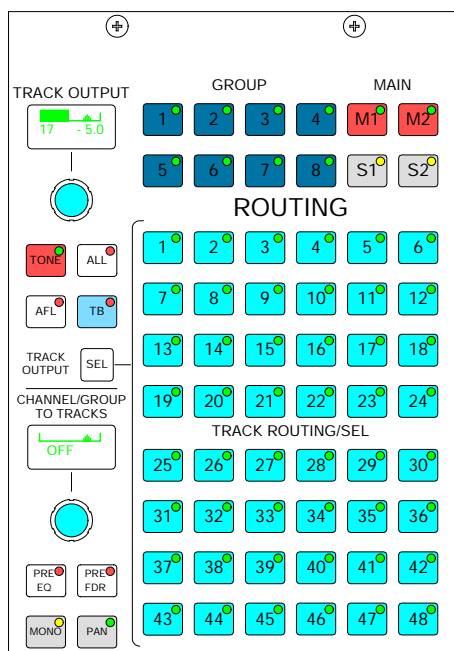
The Track Output section controls the output to the multi-track, after the track mix. The 48 track outputs can also be used as IFB or general purpose bus outputs.

The track output being controlled is selected by pressing SEL plus the required track routing button 1-48. 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 pre-EQ, pre-fader or direct output (post the mix minus and direct output level controls).

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

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 control surface.

If any of the routing buttons (groups, mains, tracks) are held down, the fader assign buttons of all the paths feeding that buss will remain lit. The fader assign buttons of paths which are not feeding the buss will cease to be lit.

This button can also be used to interrogate mix minus feeds using the BUS button on the Input/Output panel. Paths can be added or removed from the bus under interrogation, by selecting or de-selecting their fader assign buttons.

If you are using Style 1 faders, then the way in which the fader assign buttons light is slightly different. Please refer to Appendix A at the end of this manual.

Track level control

The track control section of the routing panel, includes a level control. When multiple hardware level controls are wanted, they can be assigned to any required channel 'wild' controls. For example wild 1, starting from any given fader can be assigned to track 1, wild one on the next channel up to track 2, the next to track 3 etc.

To enable this select the lowest numbered track to be assigned to a wild control using the 'TRACK SEL' function and a track button. On the wild control area of the USER screen press 'SELECT' which then shows 'REGION' then the required wild control (1, 2 etc). Press 'HOLD' then confirm the channel from where the wild controls will be assigned by using the fader A or B ASSIGN button then press the button on the highest numbered channel that is to have that wild assigned for track level control. This range of faders will determine how many tracks get assigned to wild controls. Finally press the Track Output level control knob and the wild controls will display their new function.

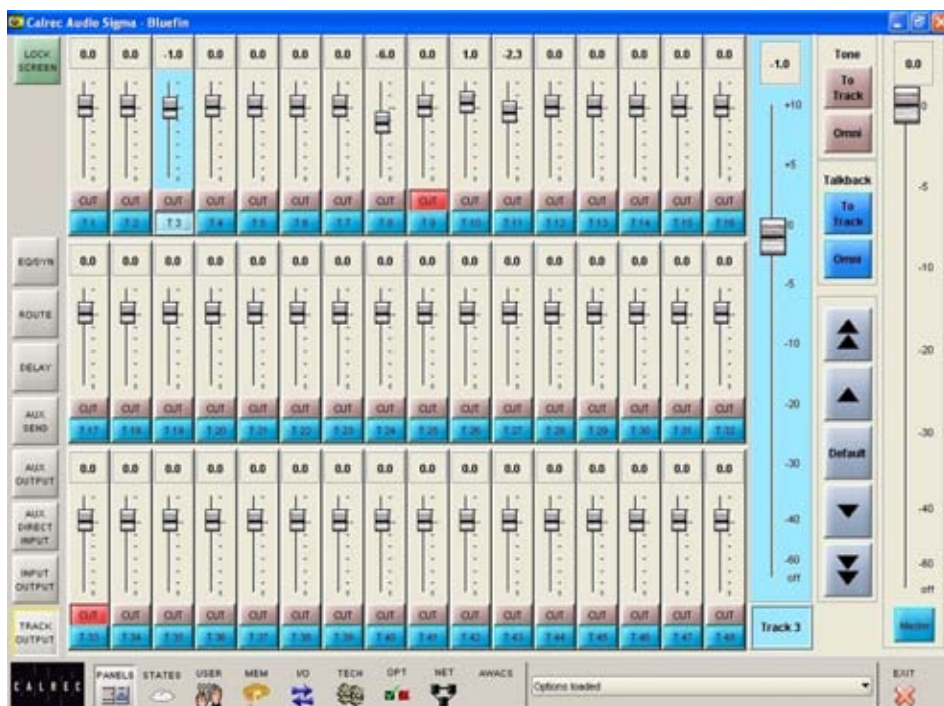
Track cut

The push switch function of the track level control can be enabled as a track cut from the 'OPTIONS' MISC screen. The same screen has a separate enable for the same function when track levels are assigned to wild controls. When tracks have been cut an X appears on any TFT meter displaying that track.

Panels-Route Screen

This screen provides alternative controls for the routing, in addition to those on the control surface. In addition, the user can choose whether to control the routing of the currently assigned fader path, or to select a different fader, known as the “PC Fader” to which settings can be applied independently of the current assignment. Control is chosen using the selection buttons “PC Fader” and “Desk Fader”

The right side of the screen has buttons for channel paths A and B, and Mains 1-4. To make changes, select the required path either by pressing its fader assign button, or by selecting it from the right side of the screen, and then use the buttons on the left side of the screen to choose the routing.



Panels - Track Output Screen

The Panels-Track Output screen allows the user to control each of the 48 track output levels using virtual faders. Each track output has its own screen-based fader, which can be adjusted by dragging the fader using the touch screen or trackball. In addition, the selected track output can be adjusted using a larger fader at the side of the screen, or using the coarse or fine nudge buttons. The default button can be used to set the selected track output to 0dB.

A master fader allows the level of all the tracks to be controlled simultaneously.

Tone or Talkback can be fed to the selected track or all at once using the selection buttons.

ROUTING MATRIX

This screen allows whole channels or individual spill paths of surround channels to be routed to mains, groups, tracks and auxiliaries, using a selection table.

Allocations to the mix minus bus, dynamics link busses and side chain independence can also be made here.

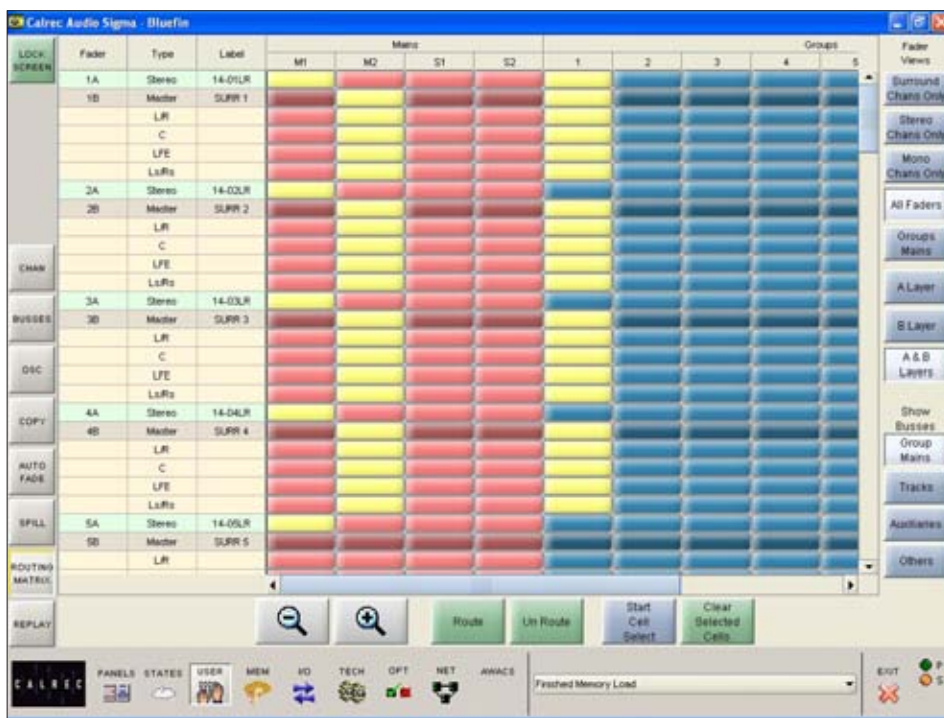
This screen not only provides alternative controls to the routing buttons on the control surface, it also gives a comprehensive visual representation of the routes made in the system, and allows the user to evaluate and control the routing more effectively.

Making Routes

The channels are listed on the left side of the screen, and the destinations are shown across the top. Routes are made by selecting the intersecting cells, which change colour to show the route is made. If a route is made on the surround master, its spill paths are also routed, and their cells also change colour to show this. De-selecting the cell will remove the route.

If surround channels or groups are routed to surround busses, all the spill legs will be routed. If surround channels or groups are routed to mono or stereo busses, only the LR, C and Ls/Rs spill legs will be routed. Individual legs can always be routed separately, using the spill panel and routing buttons or spill screen.

A surround master cannot route to the mix minus bus, the spills are routed individually.



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:

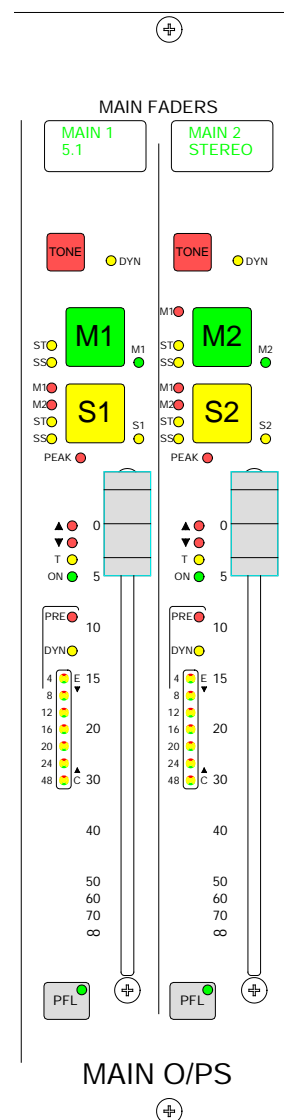
- Routing (of one main to another - indicated on the routing LEDs next to the main fader assign buttons)
- Insert on/off
- Control of the Compressor and direct input
- Control of a surround main's spill legs using the surround spill panel or User-Spill screens

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 downmix contribution of each spill leg can be controlled using the surround spill panel or User-Spill screens.

The insert and direct input are also surround.



BUSSES SCREEN

The User-Busses screen allows the width of the main, group and auxiliary busses to be defined.



Mains

Each main and sub-main output can be set to be stereo or surround here.

Groups

Group busses can be selected to be mono, stereo or 5.1 surround. Stereo channels feed a mix of left and right to mono groups. Mono channels pan L/R to stereo groups.

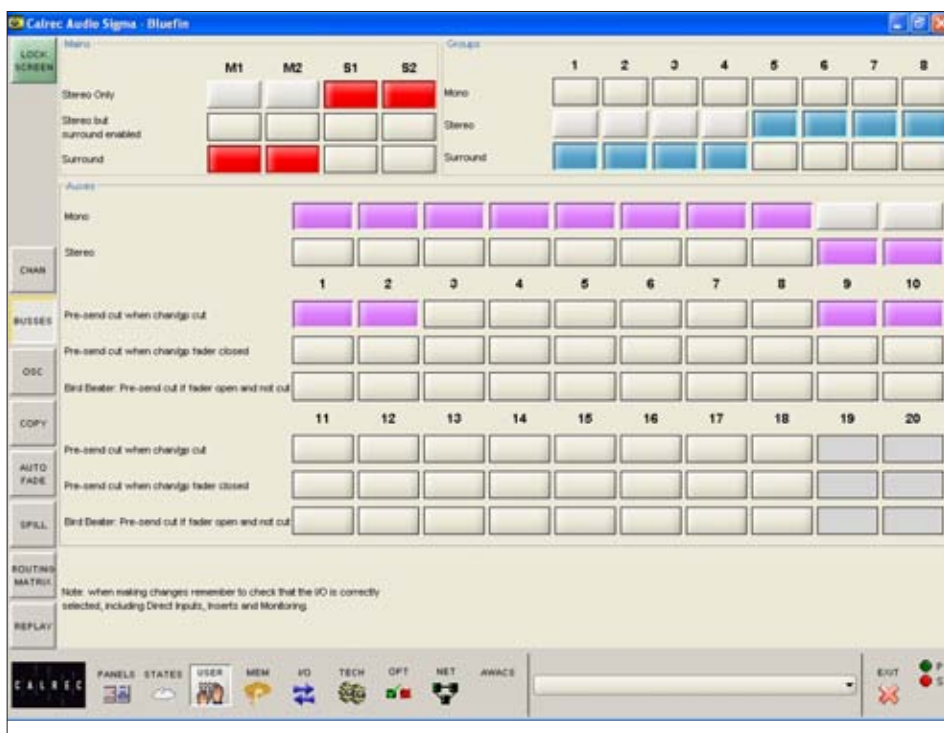
Auxiliary Busses

Mono auxiliary 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.

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.

AUXILIARIES

There are 20 mono auxiliary output busses, which can be paired up to be used as stereo auxiliary output busses.

Auxiliary 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.

Auxiliary Feeds

AUX When AUX is selected, these controls adjust 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 10 is stereo, then aux 20 will not be available (and aux 20 will not work on the monitor selector). On mono auxiliaries, buttons 11 to 20 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.

Aux Direct Inputs

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

Auxiliary Outputs

MASTER When MASTER is selected these controls adjust the auxiliary 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 10. Here, buttons 15 and 20 will be disabled.

There cannot be a level offset on the output display.

LOCK

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.

Interrogate Mode

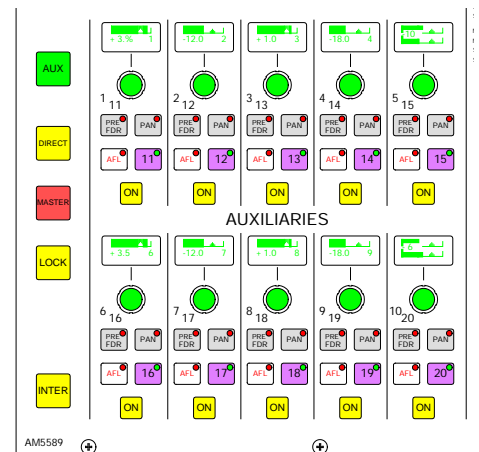
INTER INTER (latching) puts the panel into Interrogate mode. If the Aux ON buttons are held down, the fader assign buttons of all the paths feeding that buss will remain lit. The fader assign buttons of paths which are not feeding the buss will cease to be lit.

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

If you are using Style 1 faders, then the way in which the fader assign buttons light is slightly different. Please refer to Appendix A at the end of this manual.

Panels - Auxiliary Control Screens

The user can view and adjust the auxiliary send, auxiliary output and auxiliary direct input controls using the Panels - Aux Send,

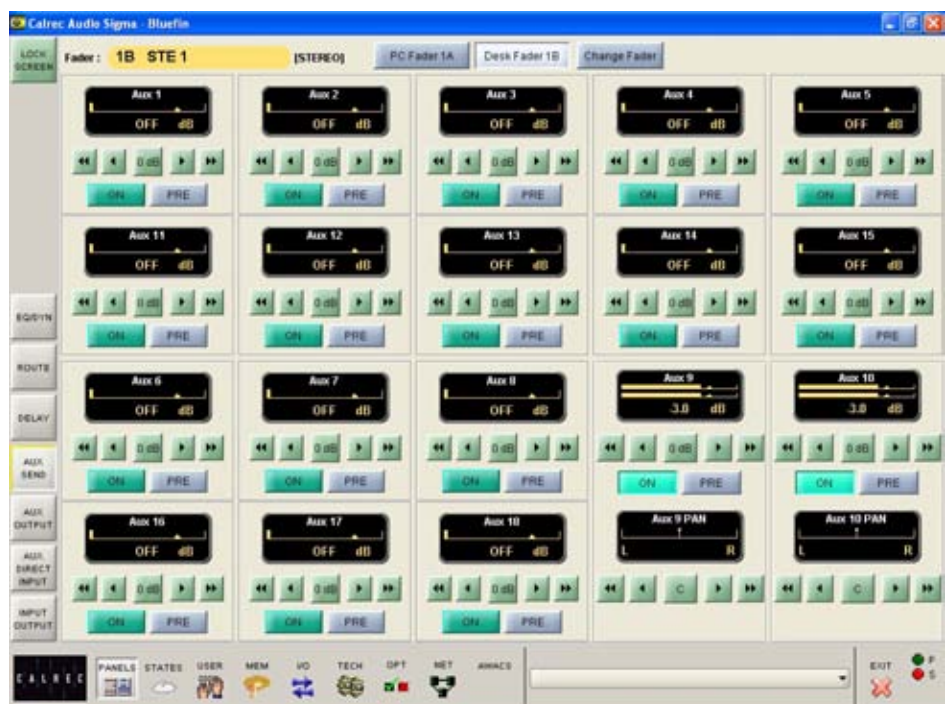


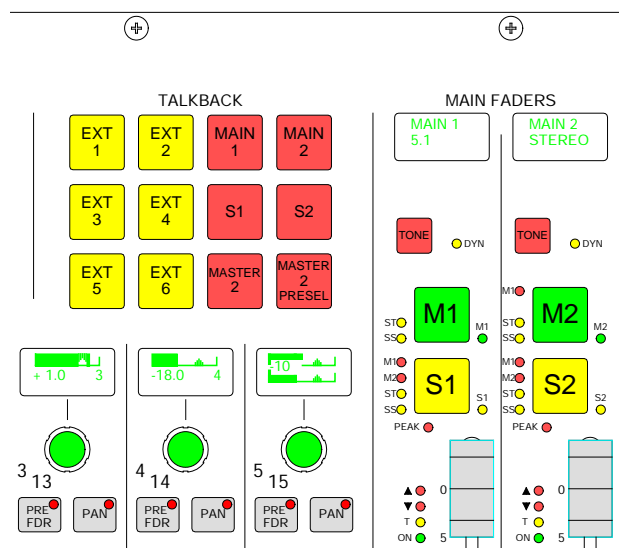
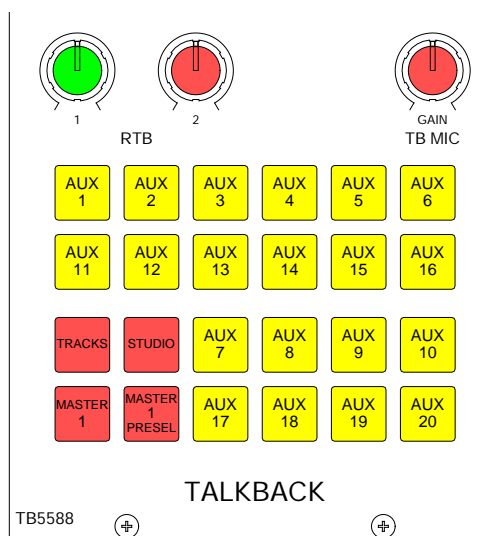
Panels - Aux Output and Panels - Aux Direct Input screens.

All of the auxiliary controls available on the control surface are available on the screens.



In addition, the user can choose whether to adjust the Aux send and output settings of the currently assigned fader path, or to select a different fader, known as the "PC Fader" to which aux send and output settings can be applied independently of the current assignment.





Talkback is available to all auxes, all Main and Sub-Main outputs, 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.

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.

Talkback is available to direct outputs using the buttons on the fader modules and Input/Output panel.

Talkback is available to individual tracks using the button in the track routing section.

Talkback inputs are patched using the OPTIONS - MON TB TONE - Talkback and Tone screen.

All Talkback buttons are subject to On-Air inhibits, set up using condition switching (TX-REH screen).

OSCILLATOR SCREEN

This screen provides controls for the oscillator.



Frequency

The frequency of the tone can be adjusted from 20Hz to 20KHz 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.

Level

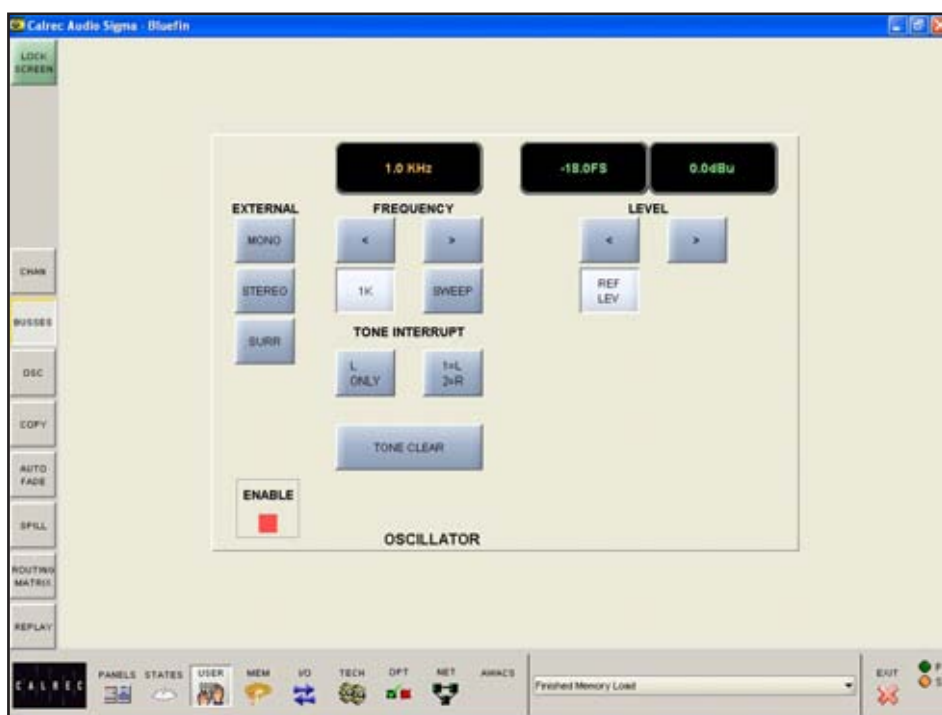
The level of the test tone can be adjusted from -60dBFS to 0dBFS using the nudge buttons, or set to the reference level using the REF LEV button.

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.

Clearing Oscillator Routes

TONE CLEAR clears all oscillator routes made, providing an easy way of removing test tones from signal paths.



External Input

The External Input buttons replace the tone with a mono, stereo or 5.1 surround external source of your choice. This allows for external oscillators to be used if preferred. The ports for this are set up on the OPTIONS - MON TB TONE - Talkback and Tone.

Enable Indicator

The Enable indicator shows that the Oscillator controls are enabled.

SIGMA MEMORIES

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.

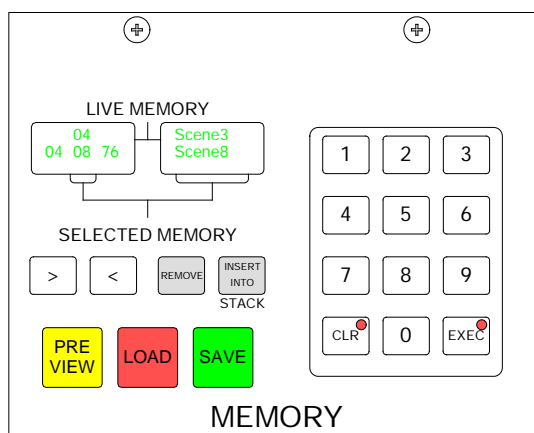
Pressing LOAD+EXEC will launch the Selected Memory into the Live Memory position, overriding the previous settings.

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 addition, selecting the required memory in the Flash ROM list on the left of the Mem-Setup 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.

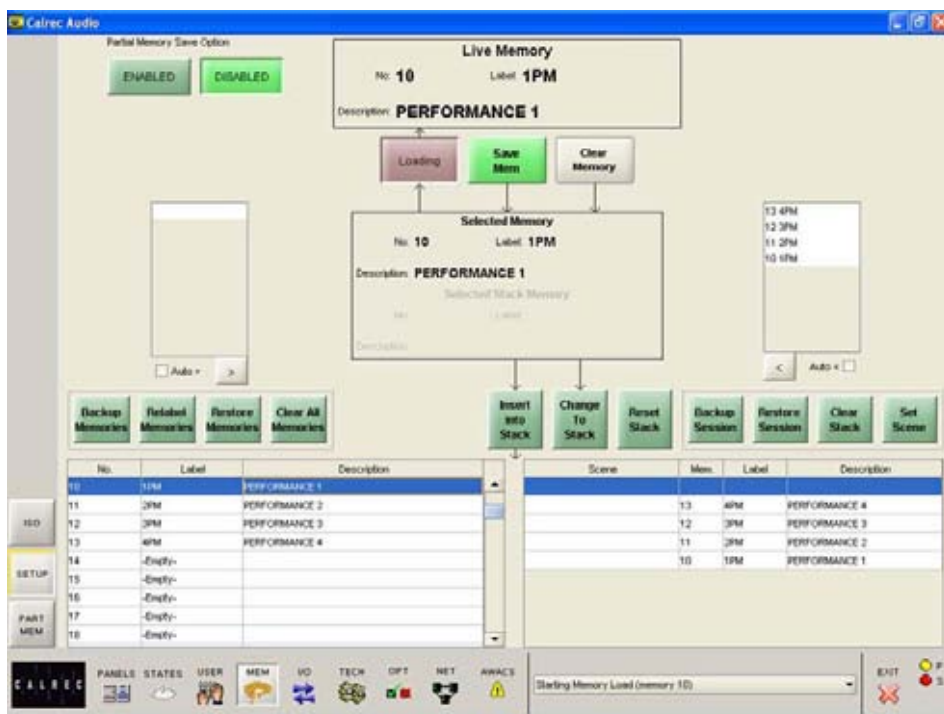


The two memories either side of the Selected Memory will appear in the windows either side of the Selected Memory window. With the Auto > or Auto < check box ticked, the next memory in the stack will automatically move to the Selected Memory position after the previous Selected Memory has been loaded 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 overwritten, 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 Isolate screen allows channel and group settings to be isolated from memory recall. This means their current settings will not be over-written when a 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 a path or settings for a path are isolated, the path will be highlighted with a red box on the right side of the screen.

Surround Paths

A surround master can be part of a memory isolation selection, but its spill paths cannot be individually isolated from memory recall.

Isolated Ports

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 highlighted 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.

Please note that Hydra output ports cannot be isolated from memory recall.

PARTIAL MEMORIES

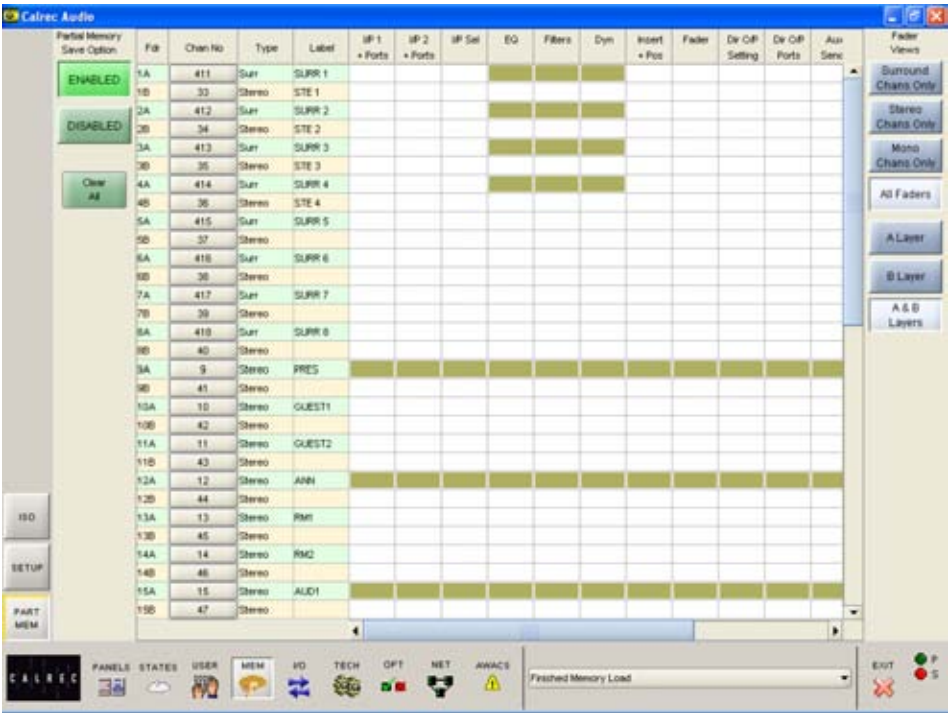
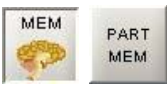
The partial memory save option allows components of console settings to be saved in the same way as full console memories. Once partial memory save option is active, the save buttons on the screen and control surface are used to save partial memories in the same way as full console memories.

When a partial memory is recalled, only the settings saved will be updated. The partial memories screen provides a mechanism for specifying channels or sub-components of channels to be saved in a partial memory.

Partial memory save option is enabled and disabled using buttons at the top left corner of the screen. These buttons are also available on the Mem-Setup screen. When enabled, all memory saves are partial memory saves. When disabled, all saves are full console saves.

Including Channel Components in a Partial Memory

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.



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

A surround master can be part of a partial memory, but its spill legs cannot be individually included in a partial memory.

SIGMA **MONITORING SYSTEM**

ASSIGNABLE MONITORING & METERING

The assignable monitor panels offer a high degree of flexibility and user-definability. Each monitor output can select the source to monitor from the available sources, independently of the other monitor outputs.

If your console has the traditional style monitor selection and LS panels, please refer to Appendix B at the end of this manual.

The sources are selected from a programmable set of selection buttons. Each monitor output's button incorporates a display, on which the currently assigned source label is shown.

(1) Selection Banks

All of the monitor sources can be grouped into 7 user-definable banks, with up to 16 sources in each bank. Sources are allocated to Banks A to G using the Options-Mon TB & Tone - Monitor Panel 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

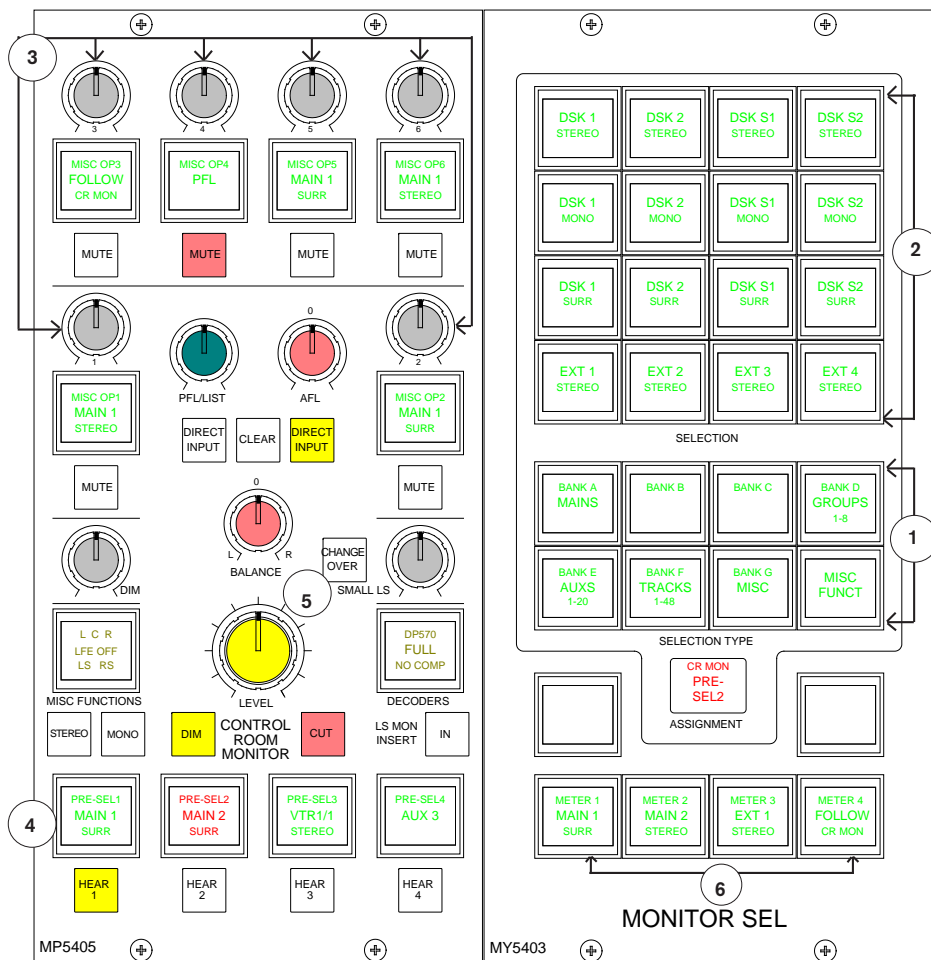
The 16 selection buttons display the available monitor sources or functions allocated to the selected bank.

(3) Misc Outputs

There are 6 misc outputs to which monitor sources can be assigned. Misc outputs 1 and 2 can be stereo, 3 stereo, or 5.1 independently. Misc outputs 3, 4, 5 and 6 are stereo only.

Each misc output will have been 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.

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.

When a misc output is selected, the misc functions bank allows options for the mute button, CUT, DIM and mono/stereo monitoring options to be applied.

(4) Control Room Pre-Selects

The 4 Control Room Pre-select buttons, allow 4 monitor sources to be preset ready for immediate listening on the main control room loudspeakers.

An example of their use might be that two of the buttons are 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, allowing the Main LS level control to be used irrespective of which LS system is in use.

The Small LS level control is used to adjust for the difference between the two sets of LS. The CHANGE OVER button diverts the monitor output to the small LS for near field, or domestic check, monitoring.

MONITOR PANEL SETUP

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 condition switching set up on the Options TX-REH screen.

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. The Listen Modes and APFL functions are located in two separate banks, and are chosen in the same way as monitor sources.

The send ports for the LS monitor insert are patched on on the I/O - Outputs - Mon TB & Osc Screen. The return ports are patched on the Options - Mon TB & Tone - MON SEL (EXT I/P) screen. The LS monitor insert is switched in and out using the button on this panel.

(6) Meter Selectors 1-4

Any of the available sources can be assigned to 4 meter selectors 1, 2, 3 and 4. Meters 1 -4 can be surround, stereo, phase and can have an optional separate M/S (L-R sum/difference) meter. With any of the meter buttons selected, the misc functions

bank (bank 8) allows Tone and M/S to be selected for that meter.

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 separate banks, and functions are chosen in the same way as monitor sources.

Monitor Selection Panel Setup Screen

This screen allows all the available monitor 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 on the assignable monitor selection panel.



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).

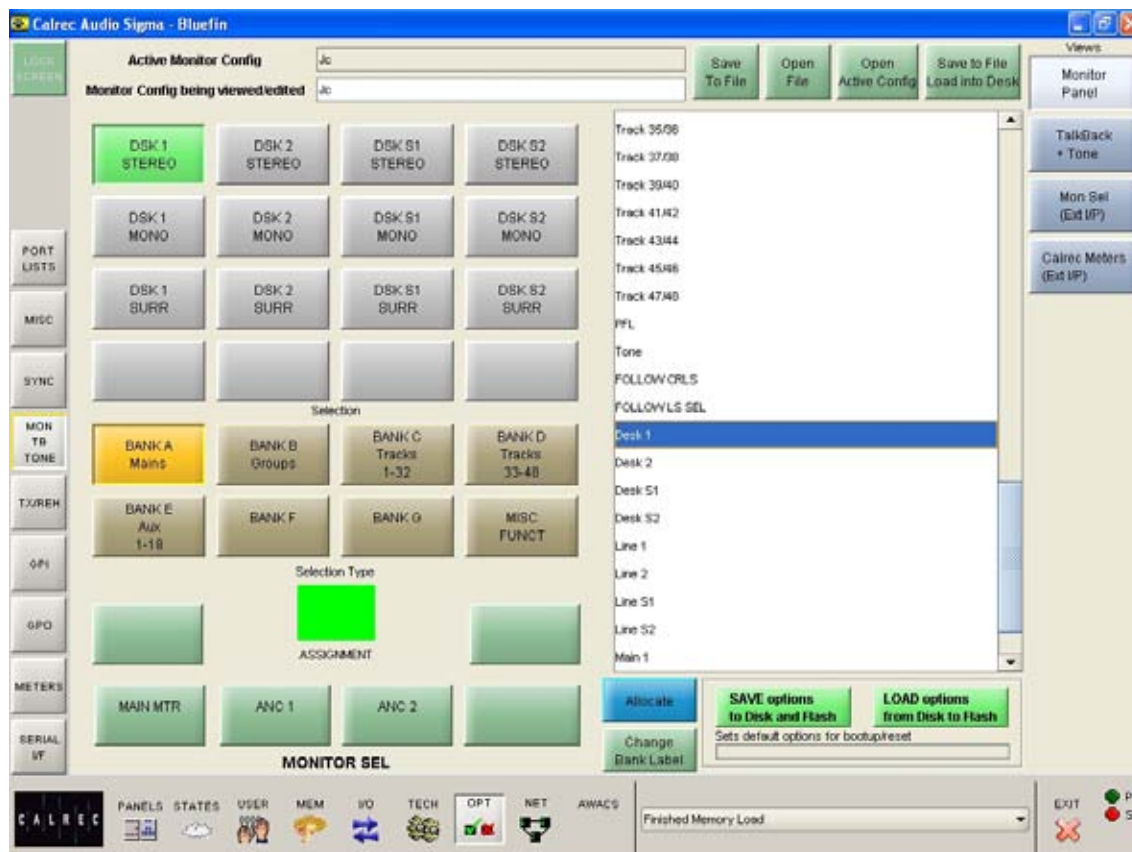
- Select the button to which you want to assign a source (screen button will flash)
- Select the required monitor source from the list
- Select "Allocate"



For external sources, a pop up window allows the user to enter a suitable label for the button, and define the source as mono, stereo or surround.

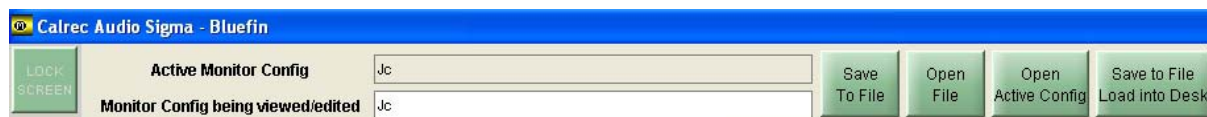
Each bank can be given a user friendly label using this screen. Select a bank, and then select the "Change Bank Label" button. Labels for the middle and bottom rows on the button can be entered. The top row will always display the bank number.

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 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.

Save To File - Load Into Desk

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/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

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

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

SAVE TO FILE will save the configuration being viewed/edited to **c:/sigma/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 separately, 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.

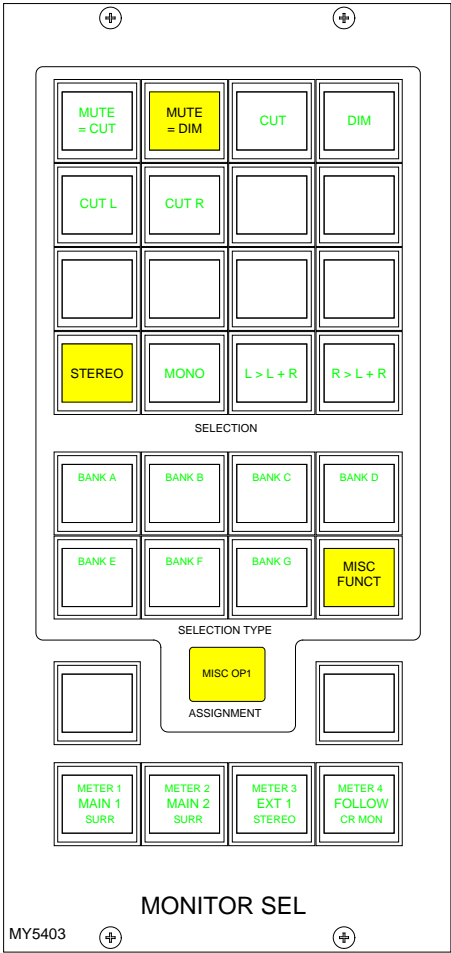
MISC OUTPUT AND METERS

Misc Output Misc Functions

When a misc output is selected, the misc functions bank allows options for the mute button, CUT, DIM and mono/stereo monitoring options 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.



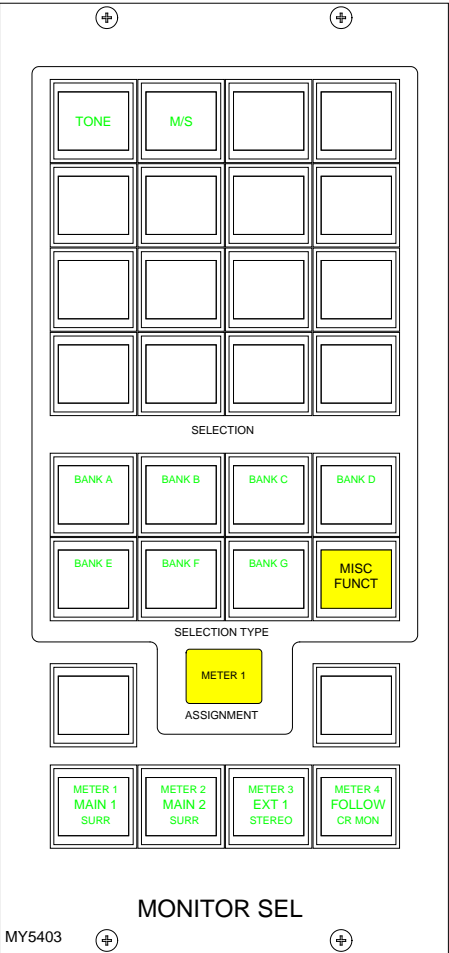
CUT L and CUT R allow the left or right leg of the selected monitor output to be cut.

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.

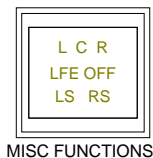
Meter 1-4 Misc Functions

When meters 1-4 are selected, the misc functions bank allows Tone and M/S (L-R sum/difference) to be selected for that meter.



CONTROL ROOM MISC 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.

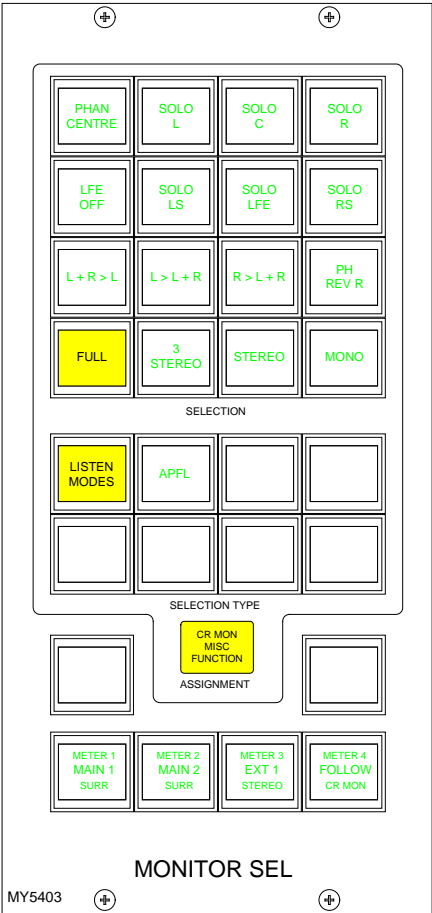


Pressing this button gives access to functions displayed on the Monitor Selections panel. The Listen Modes and APFL functions are located in two separate banks, and are chosen in the same way as monitor sources.

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 Center.

APFL

There are selection buttons for:

PFL to override each misc output 1-6

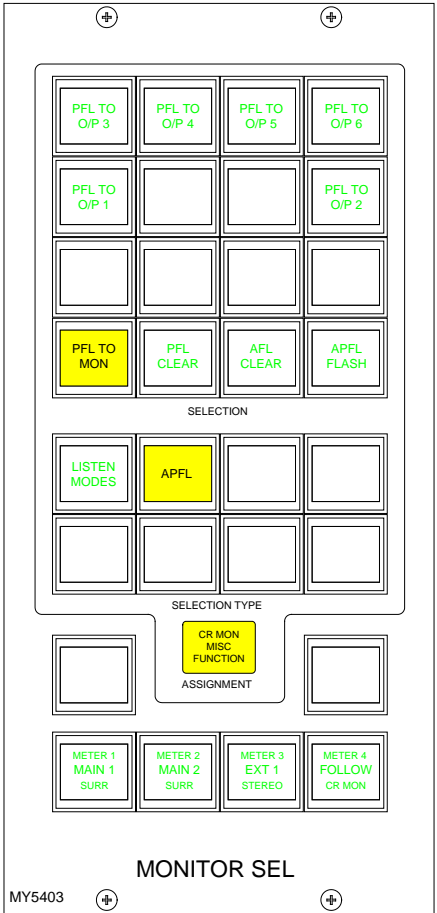
PFL to MON - Feeds the Control Room LS outputs overriding the current LS selection.

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 separate banks, and functions are chosen in the same way as monitor sources.

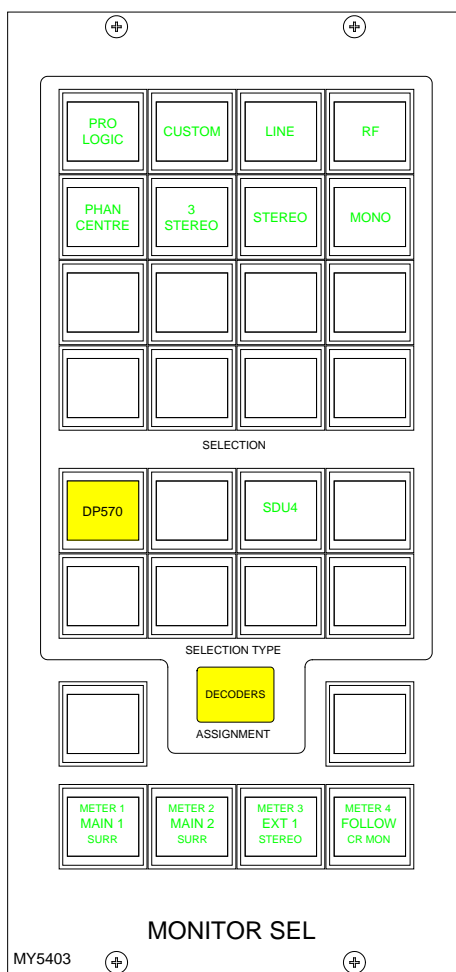
The decoder function buttons are as follows:

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 normalization.

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.



Dolby DP570 & DP564 Setup

These notes are offered for guidance only and relate to firmware versions in use around 2006. Other issues of Dolby firmware may require a different procedure and always consult the Dolby supplied documentation.

On the Dolby unit:

<label> means press the button with the name label.

Power up the unit.

<setup>

<down arrow> until you see "SYSTEM SETTINGS"

<enter> Unit name is now displayed

<down arrow> until you see "GPI setup"

<enter> "GPI pin 23" is displayed

<enter> "GPI pin 23 trigger" is displayed

<enter>

<down arrow> until you see "Edge"

<enter>

<esc> "GPI pin 23 trigger" is displayed

<down arrow> "GPI pin 23 Polarity" is displayed

<enter>

<down arrow> until you see "Positive/High"

<enter>

<esc> "GPI pin 23 Polarity" is displayed

<down arrow> "GPI pin 23 Function" is displayed

<enter>

<down arrow> until you see "FULL" meaning surround.

<enter>

<esc> "GPI pin 23 Function" is displayed

<esc> "GPI pin 23" is displayed

<down arrow> "GPI pin 24" is displayed

Repeat the process for all the GPI pins 24 - 31

<esc> "GPI setup" is displayed

<down arrow> "GPO setup" is displayed

Now go through the same routine to set up the outputs on pins 7 to 14 (as drawing/spreadsheet) with trigger as "Level", Polarity as "Positive/High", and function as spreadsheet.

<esc> Until back at original menu.

Note: With issue 1 cable, the outputs are on pins 8 to 15.

SIGMA **METERING SYSTEM**

TFT METERS

High quality TFT screen based meters can be incorporated into the console upstand either instead of or alongside moving coil or LED bargraph style meters. The user can dynamically change the layout of the TFT meters and their arrangement.

The screen layout is configured such that each half of the screen can have 4 or 6 columns, allowing 8 or 12 meter positions across its width. Each column can then be split into up to three rows which can be 1/3, 1/2, 2/3 or full height of the TFT meter panel.

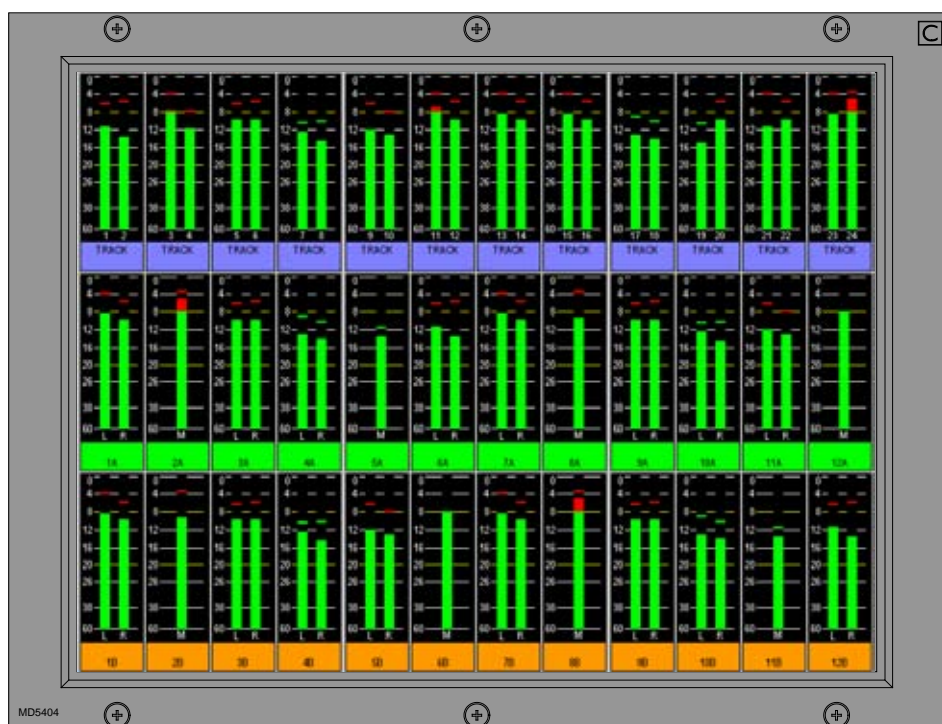
This allows a greater density of meter functions to be displayed, as each TFT meter can display up to 36 meters within the space usually taken up by just two standard meter panels.

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
- Auxiliary Outputs
- Track Outputs
- Meter Selectors
- External Inputs
- Miscellaneous functions

Each meter can be:

- Mono
- Stereo
- M/S (Sum and Difference of the stereo signal)
- Surround (L, R, C, LFE, LS, RS - sequence set as part of meter arrangement)
- Phase Display



When a screen is configured with 8 columns, these columns will line up with any faders positioned in that section of the console. This is useful when metering channel inputs or groups.

The number of meters configurable on the TFT screens is governed by the number of meter data signals available. There are 256 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.

There can be up to 128 phase meters in the configuration.

If a meter is set up to display an Aux or Track output and the channel is cut, a small X indicator will appear to clarify this.

TFT METER SETUP SCREEN

The Setup screen allows the user to change global metering settings.



Bar colours

The user can select the colours to be used on the meters. The top/middle/bottom colours for each signal can be selected independently. Select the signal from the list, then select the colours from the palette. The selected colours for each signal are shown at the bottom of the screen.

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.

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 brightness for each screen can be adjusted from 0-9 using the selection buttons. 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.



ADJUSTING TFT SCREEN LAYOUT

The user can (with some rules) control the layout of the rows and columns on the TFT screens. The numbered buttons on the Options - Meters - Layout screen allow the meter panels to be selected for set-up. Upon selection of one of the numbered buttons, the meter occupying that upstand position will be shown in the main section of the screen.



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

Rows

Each half of the screen can have two or three rows, and the meters within each column can be set to take up 1, 2 or 3 rows, to achieve different row heights for

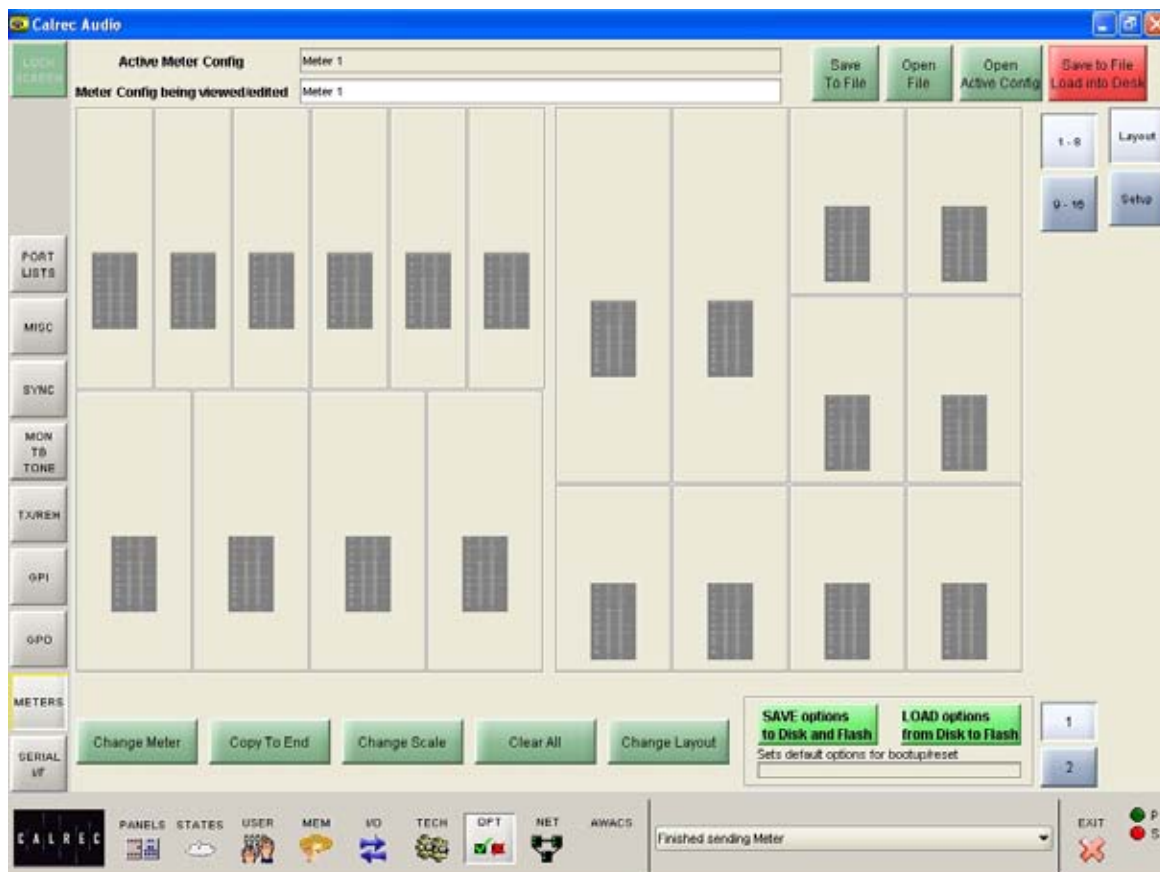
different columns. Changing the number of rows only affects meters in the selected meter's half of the screen.

Columns

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

Block Height

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



METER CONFIGURATION

Sources are allocated to TFT, bargraph or moving coil meters in the same way. 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 from mains, groups, tracks, 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.

In the case of TFT, twin or multiple-way meters, **APPLY TO ROW** will allocate 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.

When selecting channel inputs to be metered, the fader number is selected, and the path A or B. Alternatively, the meter can be set to follow the fader's currently assigned path selection (A or B).

For surround CRLS and Meters 1-3, the width of the TFT meter will automatically change to match the source.

Copy to End

Copy To End

If a source has been allocated to a meter, and that meter is selected, **COPY TO END** can be used to allocate subsequent sources in the list to all the meter positions



to the right of the selected meter position in the row, until the row is full, or you run out of sources in the list. This is similar to **APPLY TO ROW** in the pop up dialogue box, **COPY TO END** allows you to do this after the first meter has had a source allocated.

Change Scale

Change Scale

Each meter can be PPM, VU or Phase. There can be up to 128 phase meters assigned in the configuration, after all have been assigned the option will no longer be available.

The scale type can be selected individually for each meter or globally for all meters. Scales available to the user are set in the Set-up Application from a list which is longer than the system is capable of.

Clear All

Clear All

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

Tracks on TFT Meters

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.

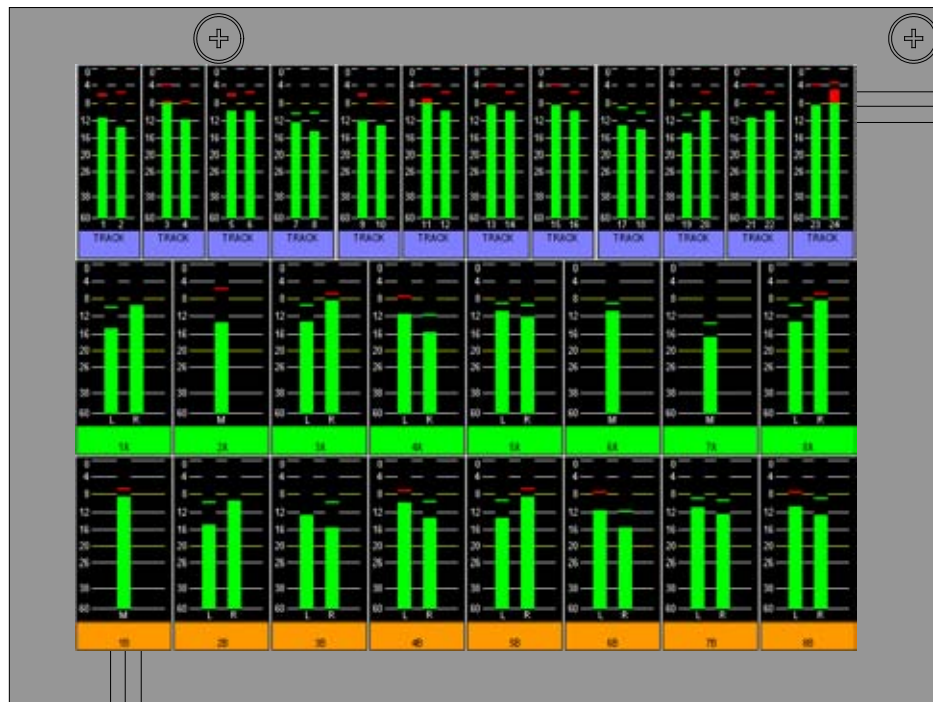
When selecting Tracks to meter, the first available options column allows two tracks to be selected for display in that meter position. The next available options column will then allow selection of the next two tracks. It is useful to change the colours for pairs of mono meters such as tracks, so that the left of the pair is a different colour to the right.

TFT CONFIGURATION EXAMPLES

In the example below, the TFT meter screen has been split up into three rows.

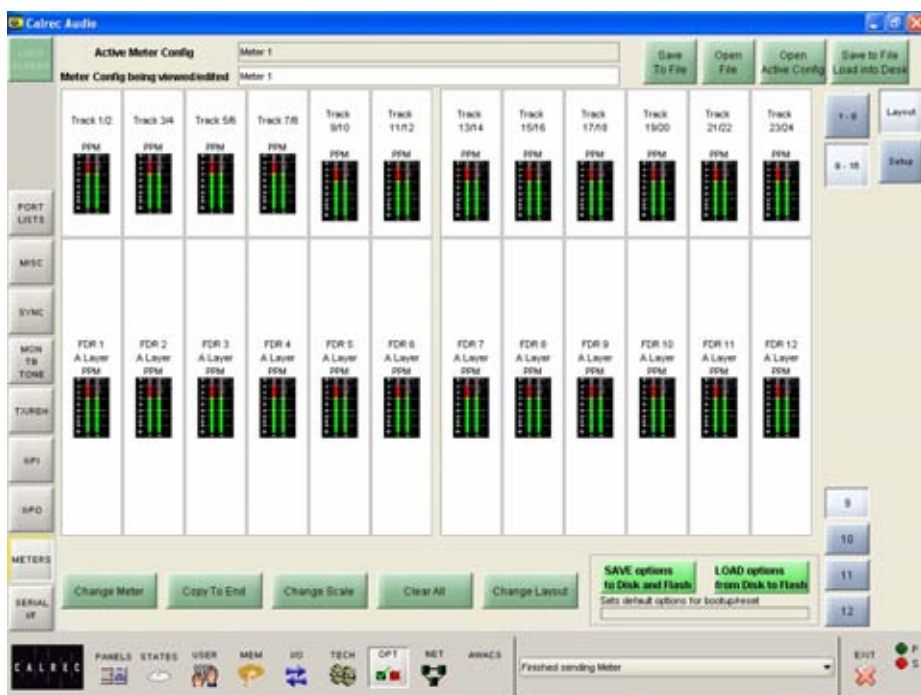
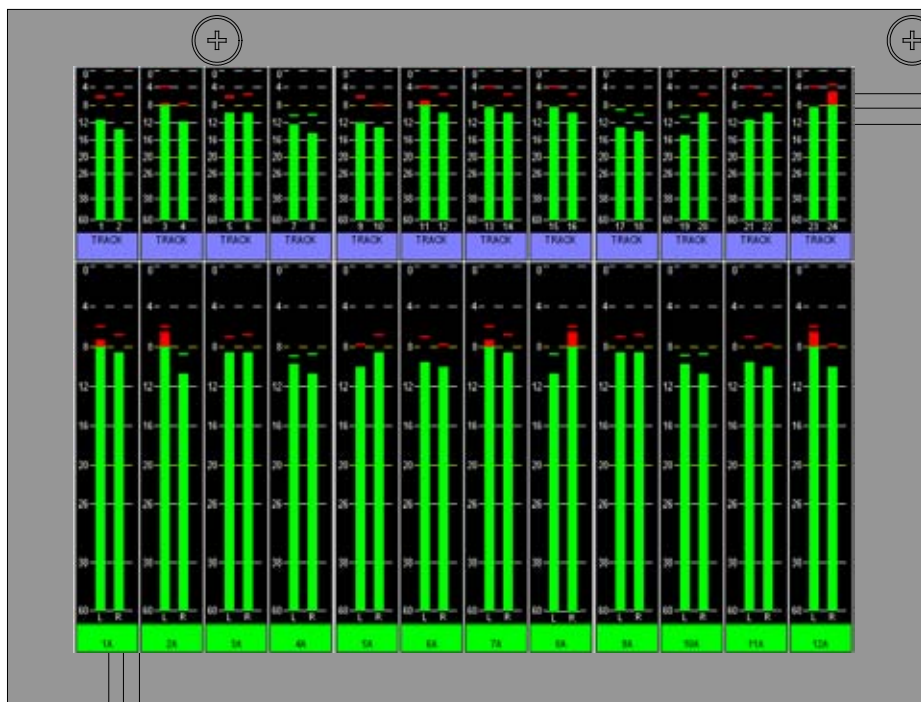
The top row has been split up into 12 meter positions to house the tracks, and the middle and bottom rows have been split up onto 8 meter positions across, to house the channel inputs for the A and B paths respectively.

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.



In the example below, the TFT meter screen has been split up into two rows with 12 meter positions across each row.

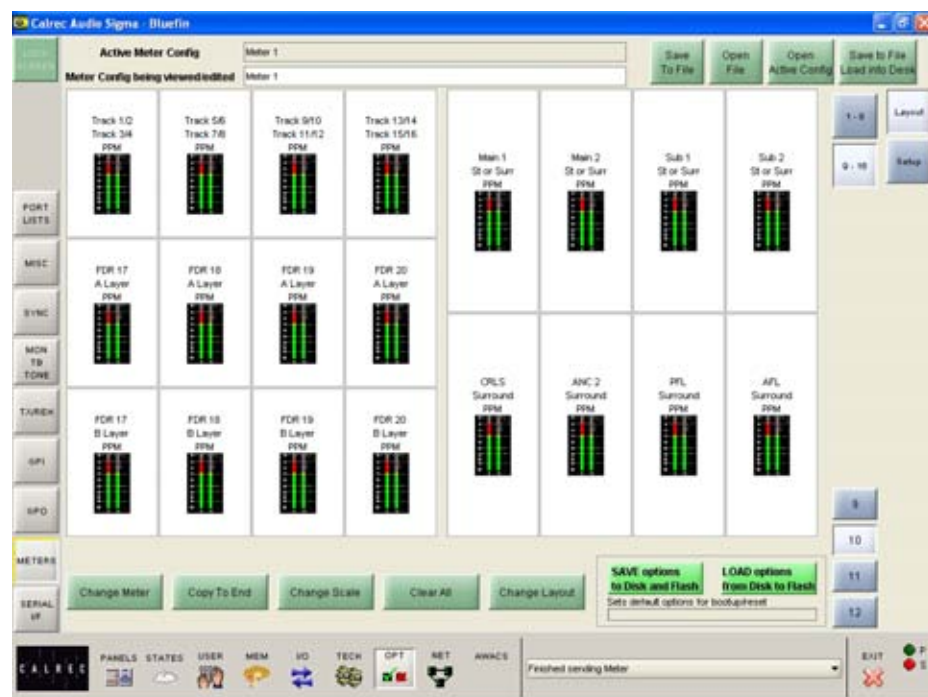
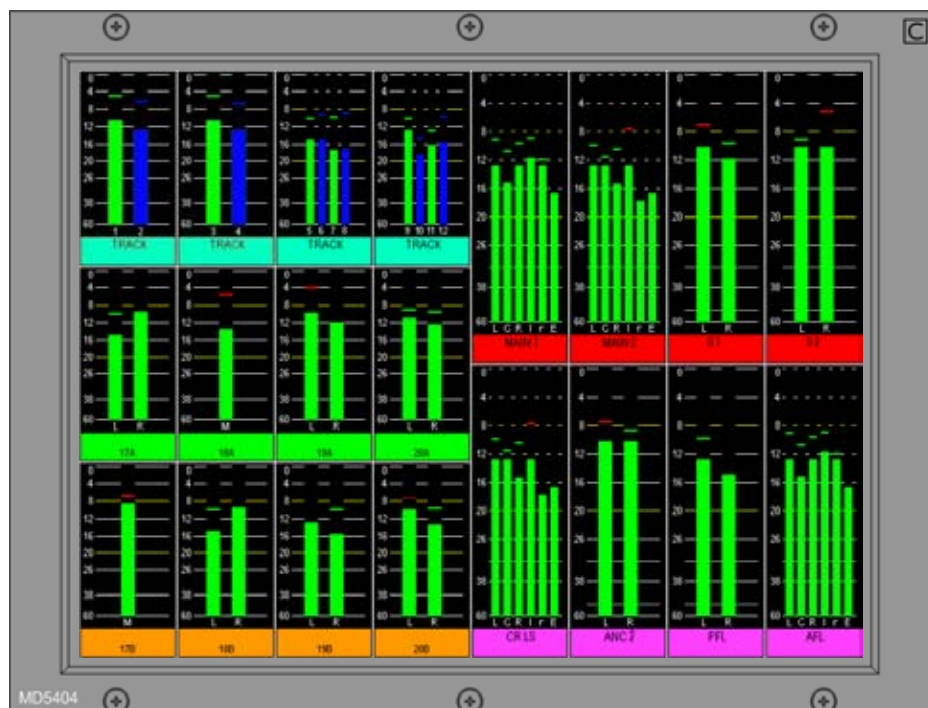
The top row takes up 1/3 of the height of the screen, and is occupied by tracks. The bottom row takes up 2/3 of the height of the screen, and is occupied by A path channel inputs.



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 tracks in pairs and fours, allowing 12 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.



SAVING AND RESTORING 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/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 separately, 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.

SIGMA **ON-SCREEN PATCHING**

INPUT PORTS

This screen allows patching of input sources to channel inputs, insert returns, direct inputs or to output ports. On the control surface, ports may also be assigned using the I/O Matrix, but these screens provide an alternative set of controls. This screen shows the patching for channel inputs.



(1) Source Lists

All of the available ports can be grouped into suitable lists using the Options - Port Lists screens. 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). When viewed as diagnostics, the list can be sorted alphanumerically, by selecting the column header.

(3) Input Views

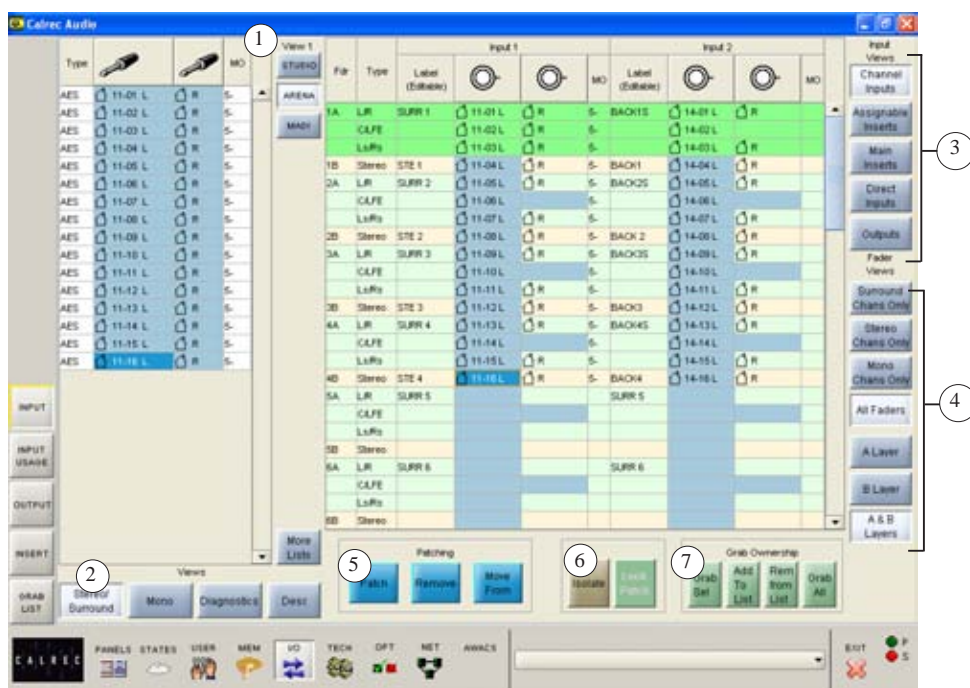
These buttons select the console path types which can have input ports attached (channel inputs, insert returns, direct inputs or outputs). They are displayed in the main section of the screen. The DESC button allows a more detailed description of the port to be stored. The description window can be closed using the "JUMP TO" button which then highlights that port on the ports screen or by clicking on the close button.

(4) Fader Views

It is possible to choose which set of faders are to be available on and altered by this screen. When a fader assign button is selected, the screen will jump to the selected fader in the list. This behaviour is enabled using the States screen.

(5) Patching

Assignment is made by selecting a source, and an input or output, 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 currently selected on the Input/Output panel). By selecting the label cell on the screen, the input name can be edited using the keyboard. The new name is stored with the channel input and replaces the source label on the fader display.

Patches can be removed when selected using REMOVE.

Connections can be moved between channel inputs when selected using MOVE FROM. 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 to a region of inputs.

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

(6) Port Isolation

Port connections can be isolated from memory recall, so that their settings will not be over-written when a different memory is loaded. Selecting Isolate a second time will de-isolate the connection. A brown cell in the Label column indicates that a port is isolated. Other console settings can be isolated using the Mem-Isolate screen.

(7) Grab Ownership

When a Hydra source or destination is patched, ownership of it assigned to the console. When several consoles share sources/destinations on the same network, the first console that connects to a source will be given control (ownership) of it. Other consoles that subsequently connect that port will not be able to control it.

The grab buttons allow the console to override ownership of the network pots, either altogether, individually, or by adding them to a "Grab List". When one or more Hydra ports are added to the grab list, the "Grab All" button changes to "Grab List". The grab list can be viewed on the Grab List screen, accessed on the left side of the screen.

OUTPUT PORTS

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. This screen shows the patching for buss outputs.



(1) Output Port Lists

All of the available ports can be grouped into suitable lists using Options - Port Lists screens. These lists can then be displayed on the right of this screen, ready to have signals patched to them from the left. Different lists are accessed using the selection buttons.

(2) Viewing Options

The ports can be viewed as pairs (for patching from stereo or surround paths), individual (for patching from mono paths), or individual with the actual rack number, card slot and output 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).

(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 selected output ports 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 first source point
- Select the output ports by dragging down the column, these have to be all in the same column
- Select Patch

(5) Remove

The 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 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 Mem- 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, the console's Main 1 output signal may be assigned 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 locking system is provided to protect critical parts of each configuration.

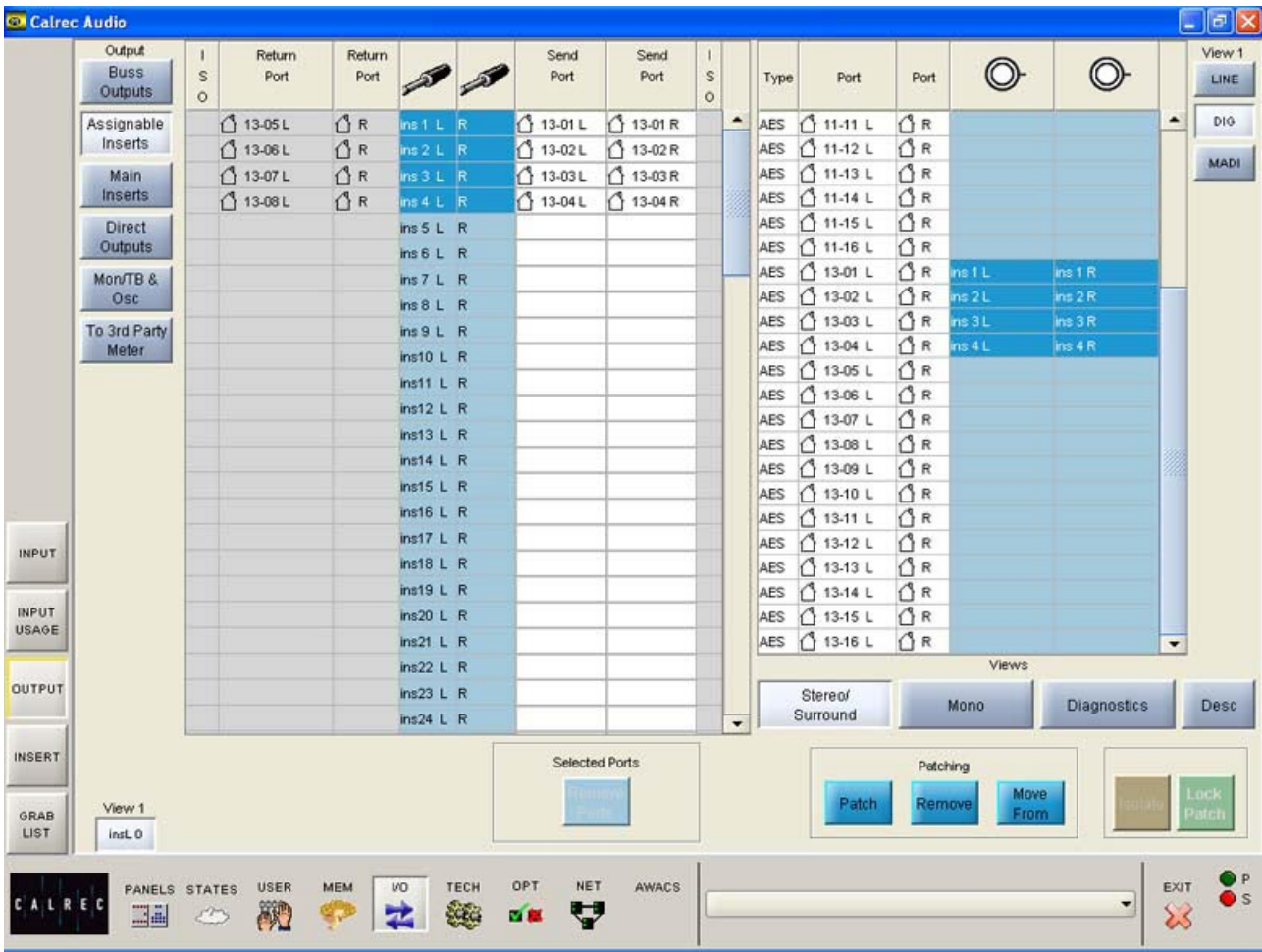
Operation of the locking system is only available in "Technician" or "Supervisor" mode which are password protected to add an extra layer of security. Modes are selected using the TECH - User Mode screen.

To lock an output port assignment, select an output port which has a source assigned to it, and select the LOCK PATCH 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.

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 assignable insert sends are set up on the I/O - Output screen, by selecting “Assignable Inserts” from the list of Output Views.

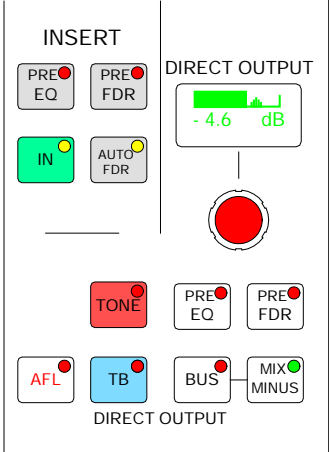


The output ports for assignable insert sends can be patched, moved and removed here in the same way that buss outputs are patched.

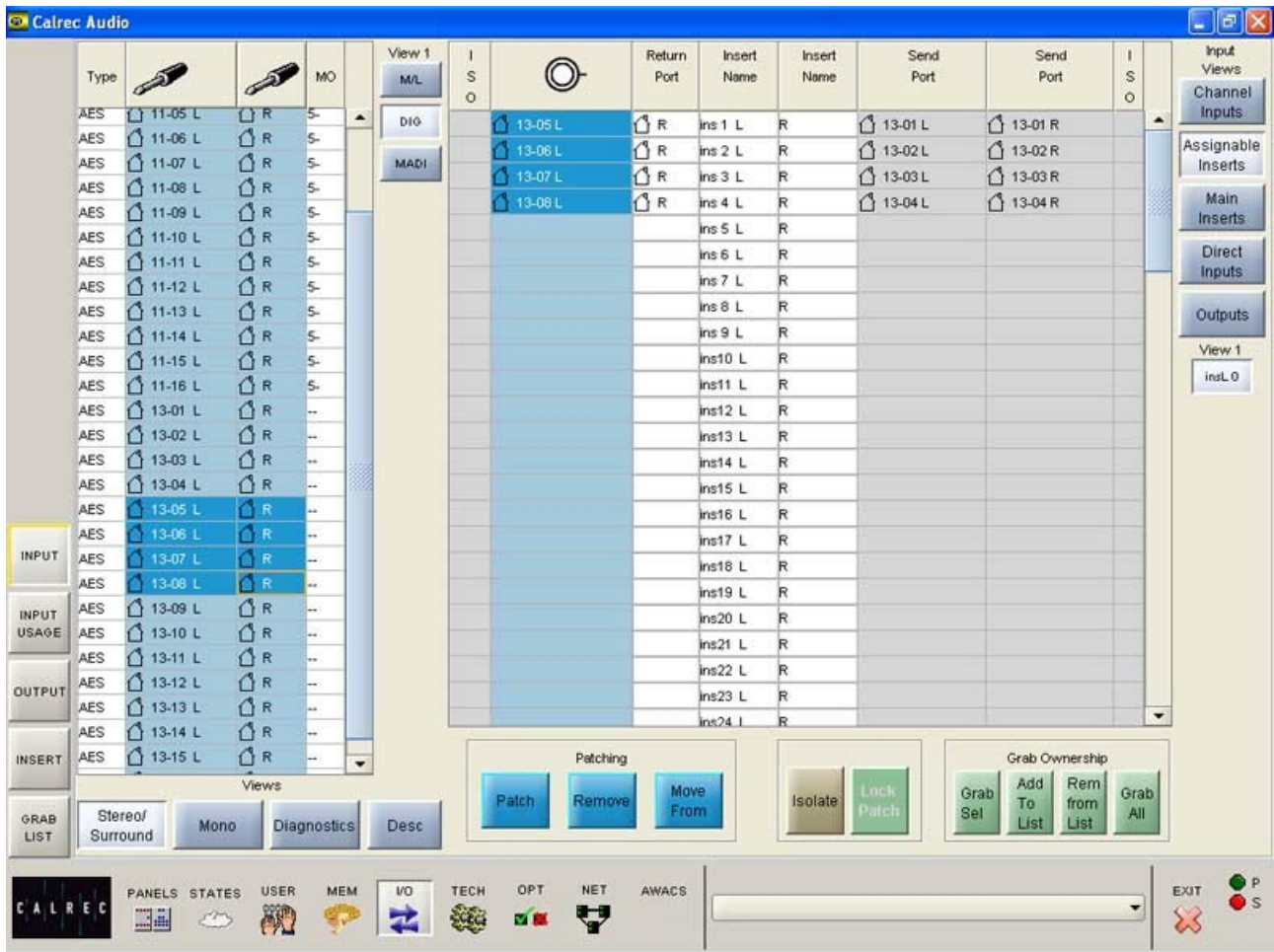
The input ports connected to the insert return can also be seen. These are set up on the I/O - Input screen.

Once this is done the insert can be connected to any channel or group via the Insert screen or by using the I/O Matrix on the control surface.

Once connected, the insert is switched into the channel path using the buttons on the Input/Output panel (shown right).



ASSIGNABLE INSERT RETURNS



The assignable insert returns are set up on the I/O - Input screen, by selecting “Assignable Inserts” from the list of Input Views.

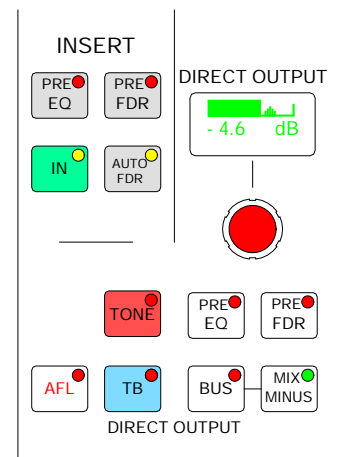


The input sources for assignable insert returns can be patched, moved and removed here in the same way that channels inputs are patched.

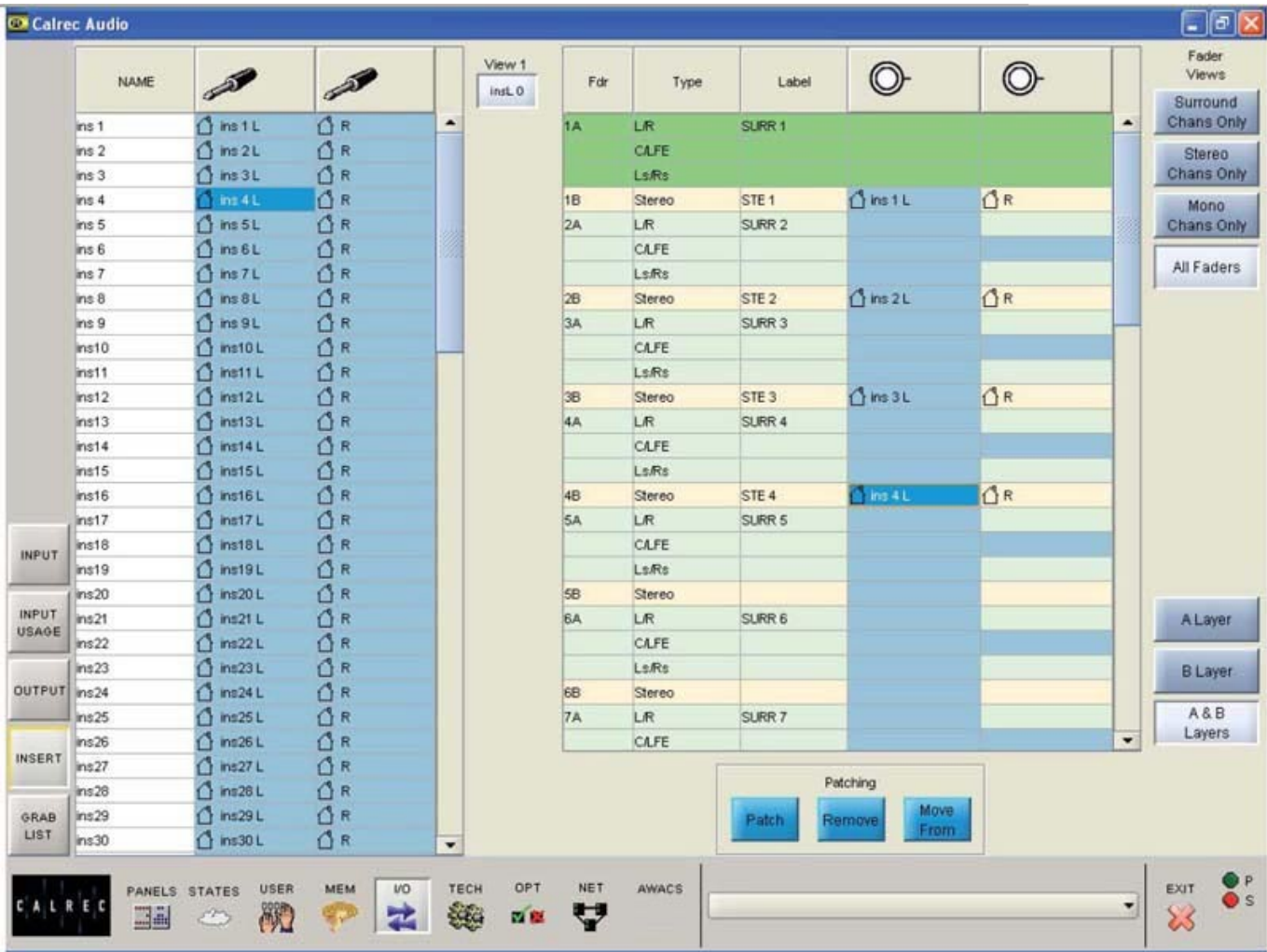
The output ports connected to the insert send can also be seen. These are set up on the I/O - Output screen.

Once this is done the insert can be connected to any channel or group via the Insert screen or by using the I/O Matrix on the control surface.

Once connected, the insert is switched into the channel path using the buttons on the Input/Output panel (shown right).



INSERT SCREEN



Once the assignable insert sends and returns have been set up on the I/O - Input and I/O - Output screens, they can be patched here to channels and groups, in the same way that channel inputs are patched.

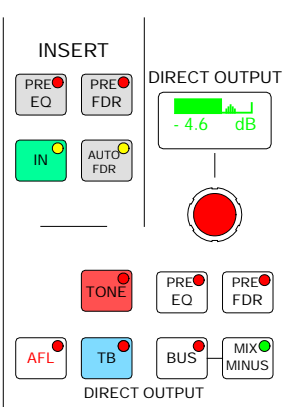


The Fader View buttons select which paths are on display.

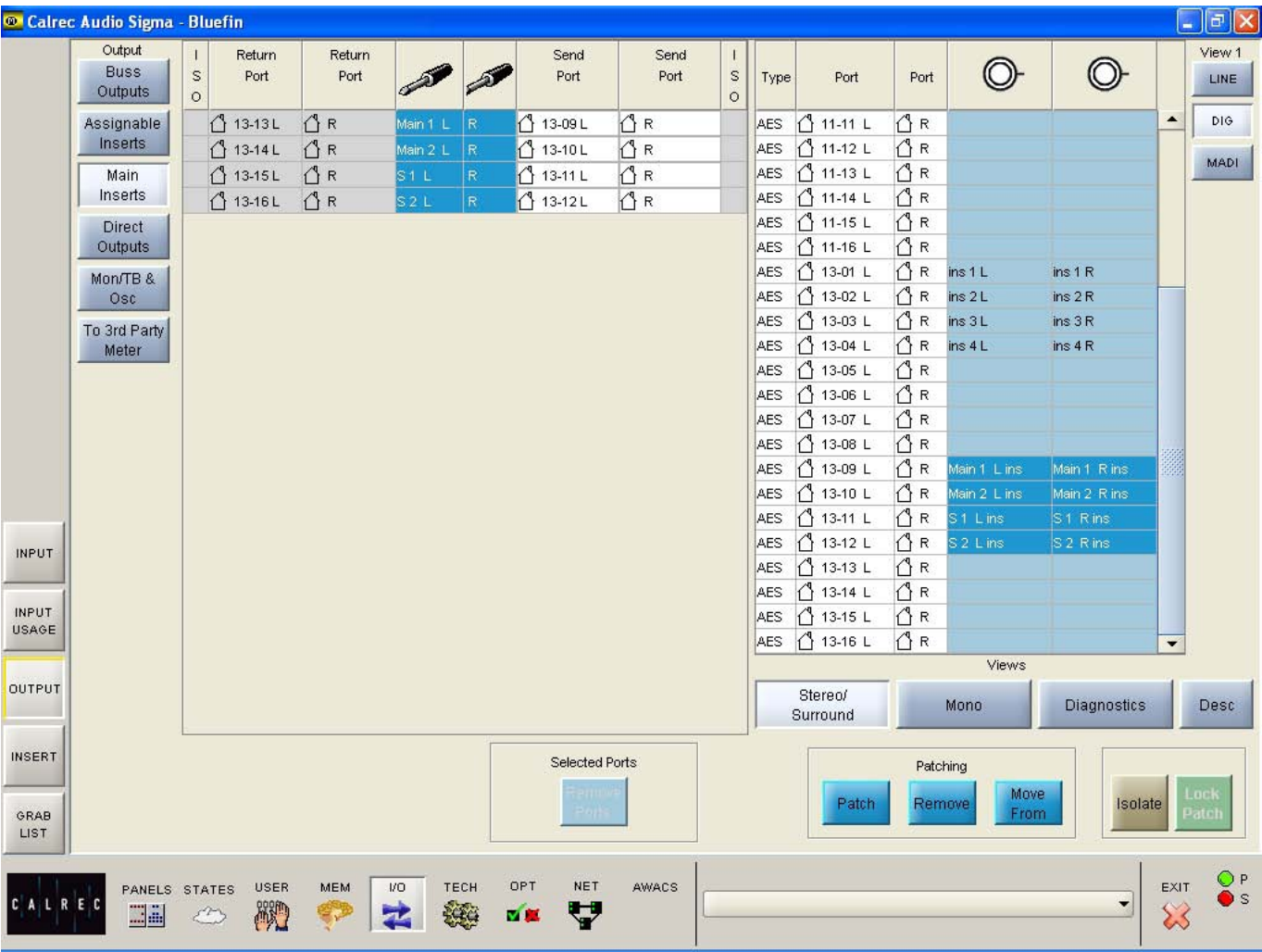
All the inserts can be accessed on the left hand side of the screen. Most inserts are treated as pairs in the labelling. L and R are used to distinguish the two halves of the pair. This makes it easier for them to be used as a stereo insert but does not necessarily mean they are stereo. The two halves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

separate mono signals. The inserts can be viewed as pairs (best for patching to stereo paths) or individual (best for patching to mono paths).

Note: If groups are set to be mono, only the left insert will have a signal on it. The assignable inserts can also be patched to channels and groups by using the I/O Matrix panel. Once connected, the insert is switched into the channel path using the buttons on the Input/Output panel.



MAIN INSERT SENDS

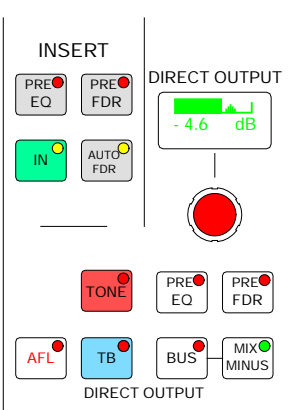


The main insert sends are set up on the I/O - Output screen, by selecting “Main Inserts” from the list of output views. The output ports for main insert sends can be patched, moved and removed here in the same way as buss outputs are patched.

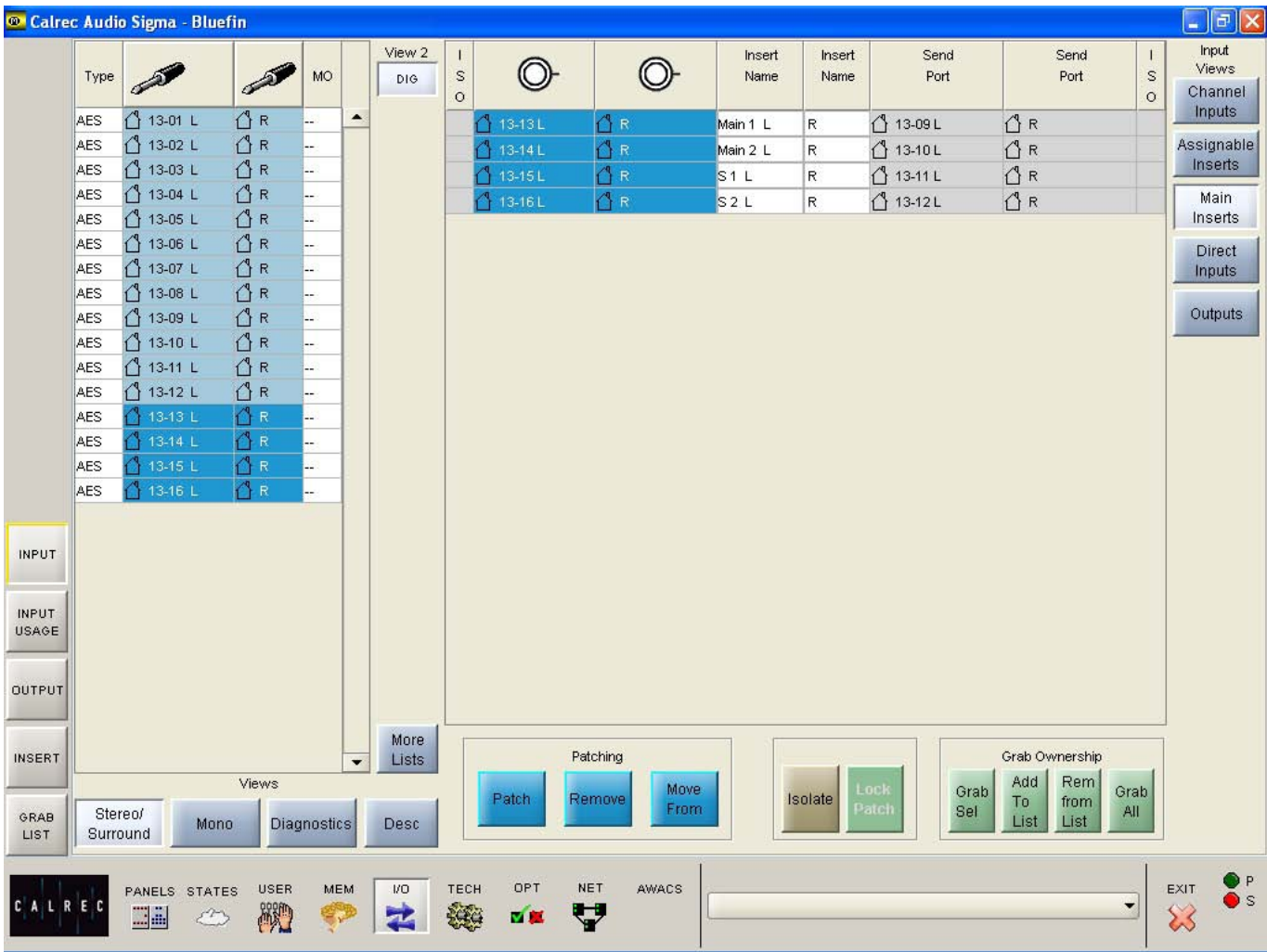


The input ports connected to the insert return can also be seen. These are set up on the I/O - INPUT screen.

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.



MAIN INSERT RETURNS

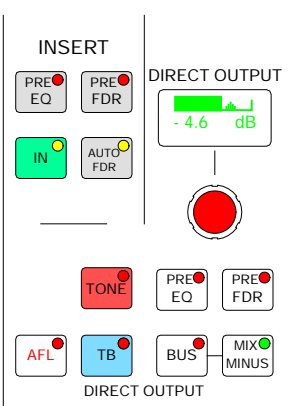


The main insert returns are set up on the I/O - INPUT screen, by selecting “Main Inserts” from the list of Input Views. The input sources for main insert returns can be patched here in the same way that channel inputs are patched.

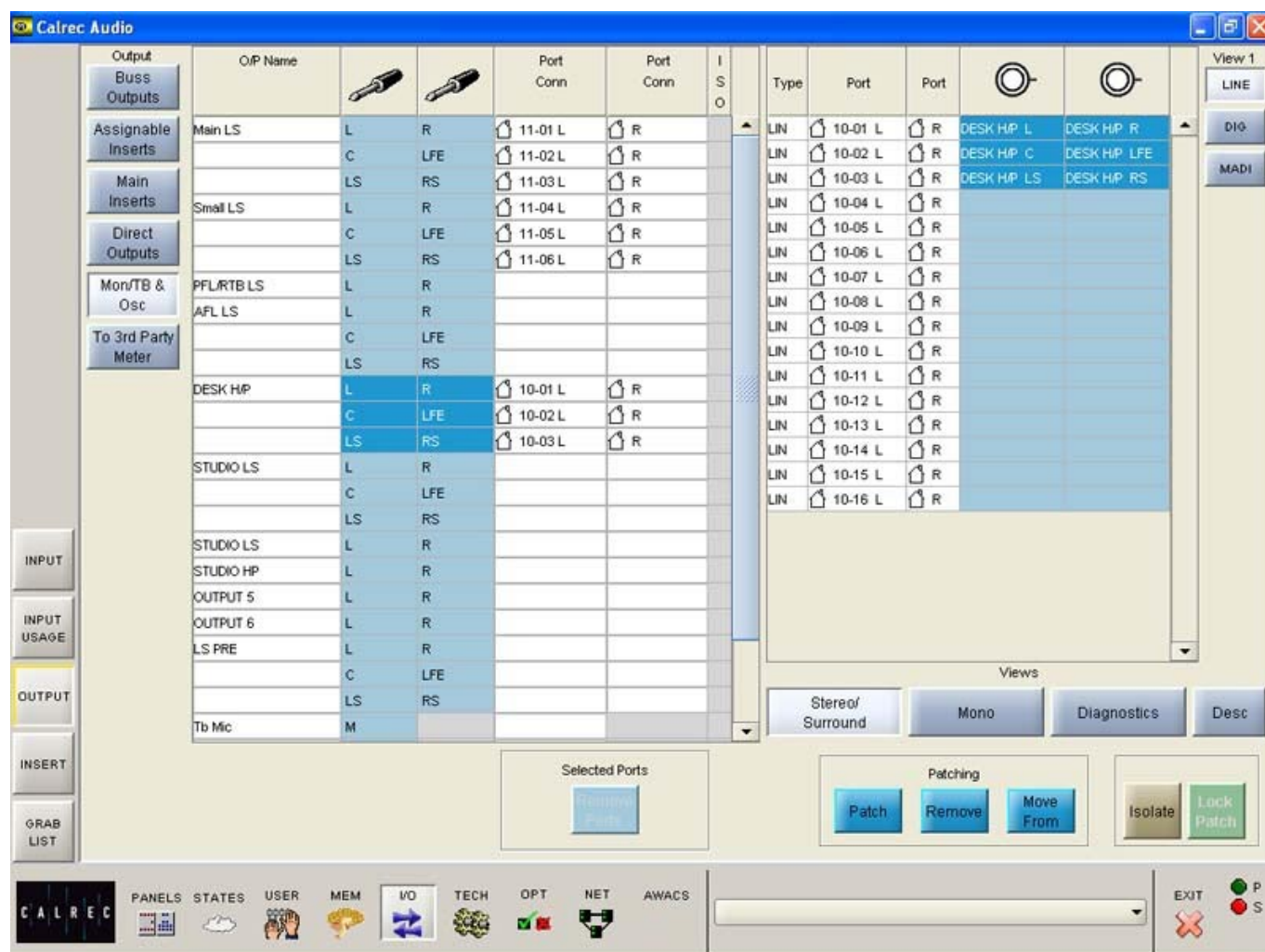


The output ports connected to the main insert send can also be seen. These are set up on the I/O - Output screen.

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.



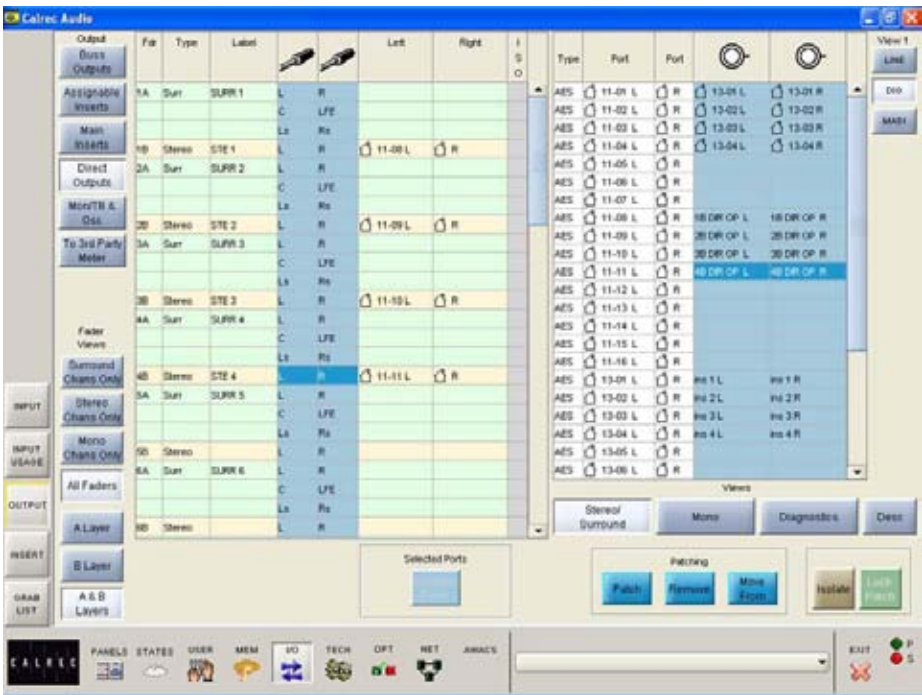
LS Monitor Insert

The send ports for the LS monitor insert are patched on this screen. The return ports are patched on the Options - Mon TB & Tone - MON SEL (EXT I/P) screen. The LS monitor insert is switched in and out using the button on the monitor LS panel.

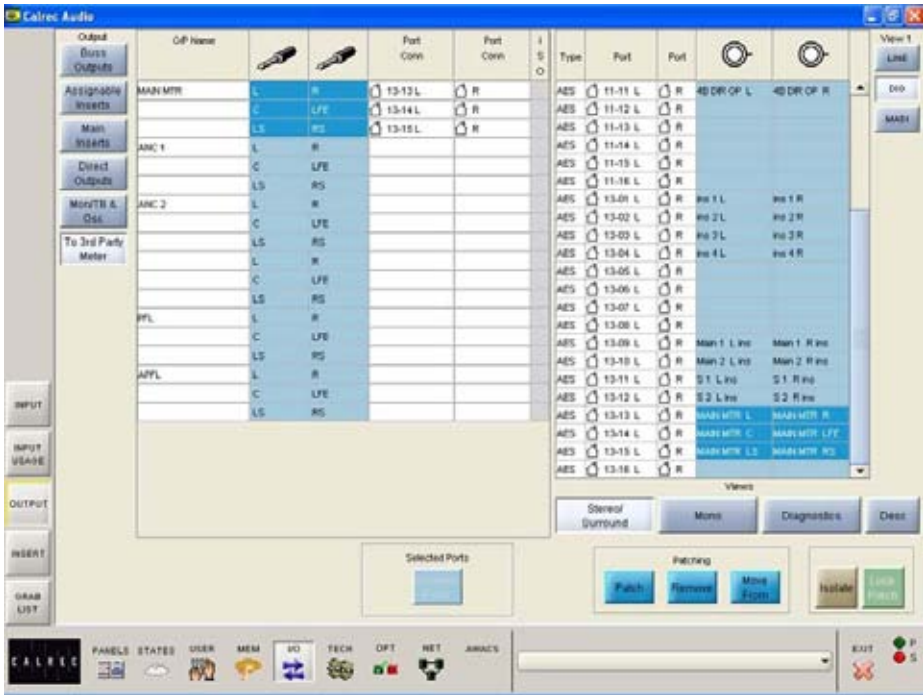
When using the traditional style monitor panels, the LS monitor insert can be switched in and out on the States Screen in addition.

DIRECT OUTPUT PORTS

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.



EXTERNAL METER OUTPUT PORTS



The output ports for 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.



INPUT-OUTPUT PORTS

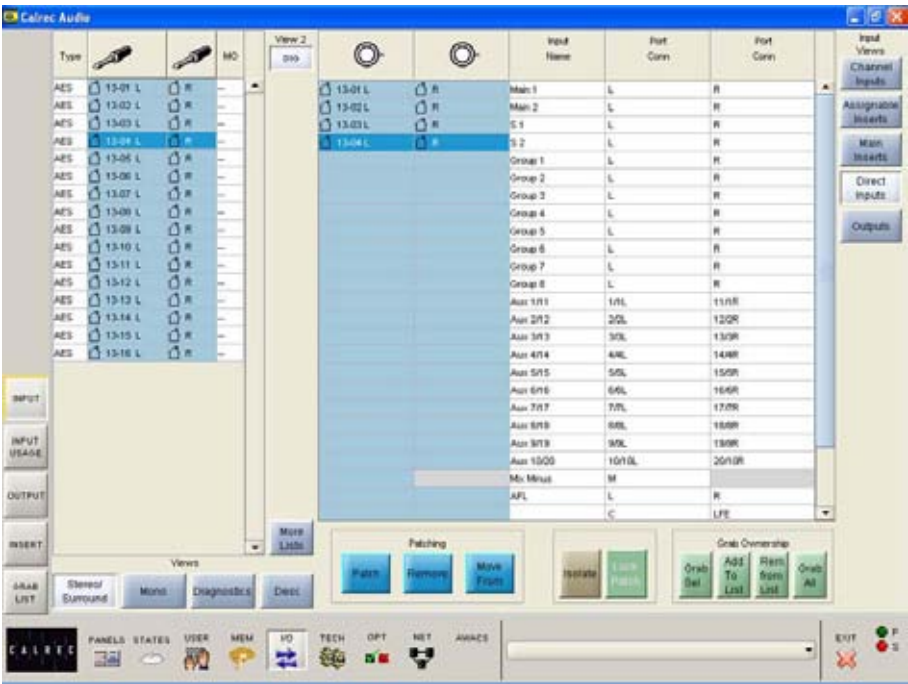


Input ports can be patched directly to output ports on the I/O - INPUT screen, by selecting “Outputs” from the list of Input Views.



DIRECT INPUT PORTS

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



INPUT USAGE SCREEN

Calrec Audio

All Input Connections

Port	R.S.P	Channel Inputs		Assignable Inserts	Main Inserts	Direct Inputs	Outputs	Port Description
		Input 1	Input 2					
11-01 L	1:11:1	Fdr 1A L						AREA 1 - LR - EQUIP1 - A1
11-01 R	1:11:2	Fdr 1A R						AREA 1 - LR - EQUIP1 - A1
11-02 L	1:11:3	Fdr 1A C						AREA 1 - CALFE - EQUIP1 - A2
11-02 R	1:11:4	Fdr 1A LFE						AREA 1 - CALFE - EQUIP1 - A2
11-03 L	1:11:5	Fdr 1A Ls						AREA 1 - LSRS - EQUIP1 - A3
11-03 R	1:11:6	Fdr 1A Rs						AREA 1 - LSRS - EQUIP1 - A3
11-04 L	1:11:7	Fdr 1B L						AREA 1 - LR2 - EQUIP1 - A4
11-04 R	1:11:8	Fdr 1B R						AREA 1 - LR2 - EQUIP1 - A4
11-05 L	1:11:9	Fdr 2A L						AREA 2 - LR - EQUIP2 - A1
11-05 R	1:11:10	Fdr 2A R						AREA 2 - LR - EQUIP2 - A1
11-06 L	1:11:11	Fdr 2A C						AREA 2 - CALFE - EQUIP2 - A2
11-06 R	1:11:12							AREA 2 - CALFE - EQUIP2 - A2
11-07 L	1:11:13	Fdr 2A Ls						AREA 2 - LSRS - EQUIP2 - A3
11-07 R	1:11:14	Fdr 2A Rs						AREA 2 - LSRS - EQUIP2 - A3
11-08 L	1:11:15	Fdr 2B L						AREA 2 - LR2 - EQUIP2 - A4
11-08 R	1:11:16	Fdr 2B R						AREA 2 - LR2 - EQUIP2 - A4
11-09 L	1:11:17	Fdr 3A L						AREA 3 - LR - EQUIP3 - A1
11-09 R	1:11:18	Fdr 3A R						AREA 3 - LR - EQUIP3 - A1
11-10 L	1:11:19	Fdr 3A C						AREA 3 - CALFE - EQUIP3 - A2
11-10 R	1:11:20							AREA 3 - CALFE - EQUIP3 - A2
11-11 L	1:11:21	Fdr 3A Ls						AREA 3 - LSRS - EQUIP3 - A3
11-11 R	1:11:22	Fdr 3A Rs						AREA 3 - LSRS - EQUIP3 - A3
11-12 L	1:11:23	Fdr 3B L						AREA 3 - LR2 - EQUIP3 - A4
11-12 R	1:11:24	Fdr 3B R						AREA 3 - LR2 - EQUIP3 - A4
11-13 L	1:11:25	Fdr 4A L						AREA 4 - LR - EQUIP4 - A1
11-13 R	1:11:26	Fdr 4A R						AREA 4 - LR - EQUIP4 - A1
11-14 L	1:11:27	Fdr 4A C						AREA 4 - CALFE - EQUIP4 - A2
11-14 R	1:11:28							AREA 4 - CALFE - EQUIP4 - A2
11-15 L	1:11:29	Fdr 4A Ls						AREA 4 - LSRS - EQUIP4 - A3

INPUT

INPUT USAGE

OUTPUT

INSERT

GRAB LIST

View 1

STUDIO

ARENA

MADI

More Lists

CALREC

PANELS

STATES

USER

MEM

I/O

TECH

OPT

NET

AWACS

EXIT

P

S

The Input Usage screen shows a summary of all input port connections.



Fader, insert, direct input and output allocations are shown for each input port, along with any long description entered for the port during the set up of the console, or on the Options - Port Lists screens.

The input ports can be viewed by list, using the selection buttons on the right of the screen. The “More Lists” button gives access to lists which have been allocated to subsequent views.

Lists are set up using the Options - Port List screens.

SIGMA **PORT LIST MANAGEMENT**

PORT LIST ALLOCATION

All of the available input and output ports can be grouped into lists using the Options - Ports Lists screens. These lists are then available on the I/O screens and can be made available on the control surface port selection controls. Lists and their settings set up here can be saved and recalled as configurations.



Up to 20 lists for input ports and 20 lists for output ports can be made available on the control surface. There can be an unlimited number of lists available on the screens. The buttons at the bottom right corner of the screen switch between input port lists and output port lists.

Allocating Ports To Lists

To add ports to lists, select the port from the Port Name column (multiple ports can be selected by dragging down the column) and select "Move to List". A window will appear for the user to choose which list to move the port to. Alternatively, with a port or ports selected, choose "Create New List" to add the port or ports to a new list.

List Management

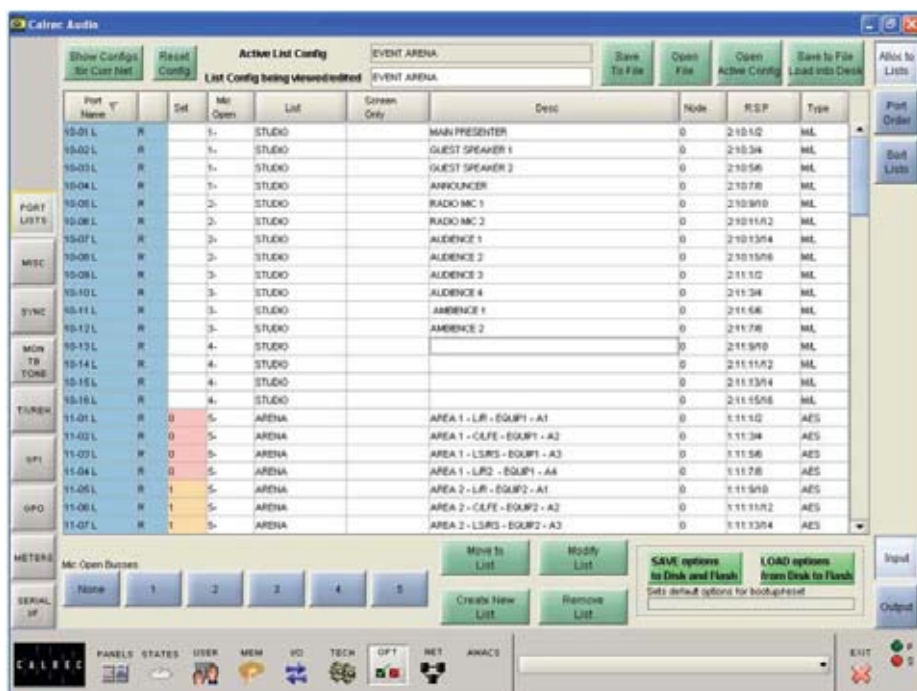
New lists are created using the "Create New List" button. "Remove List" deletes lists from the configuration (once lists are removed from a configuration they are deleted permanently). "Modify List" allows the user to change the name of a list.

Accessing Lists using the Port Selection Controls

For input port assignment and direct output port assignment, the port selection controls on the control surface can be used. Its display shows the current port on the top half of the display, and the list it occupies underneath. Pressing and turning the rotary control gives access to other lists. Lists appear in the viewing order set on the Options - Port Lists - Sort Order screen.

Screen Only Lists

When creating or modifying a list, the user can choose whether the list is to be made available from the screen only. This



means that the list will not be available for selection on the control surface port selection controls. This makes control surface port selection easier, as it ensures only the relevant lists are displayed. All lists are always available on the I/O patching screens.

Port Description

Each port can be given a long description, which could describe the port's use, or it could be some information on where to find the connection within the installation, for example, its location on a patchfield. Descriptions are typed directly into the description column. In addition to being displayed on the port list management screens, these descriptions appear on the I/O patching screens under the "DESC" button, and on the I/O - Inputs Usage screen.

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 program output.

First select the input from the list and then select the required mic open buss button. The mic open buss number will appear in the "Mic Open" column (There will be two

digits if both legs of a pair of inputs are assigned to a mic open buss). 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 - TX/REH and Options - GPO screens.

Networked Ports

Hydra input and output ports can be allocated to lists along with local I/O. When a network configuration is saved, it is associated with the current list configuration. When the network configuration is restored at a later date, if the system does not match the expected list configuration, the user will be prompted to load it, or to resave the network configuration with the new list configuration.

If a network configuration is edited to remove ports, the list configuration should be re-sent to the console before the changes to the lists will take effect.

PORT LIST ORDER



Once lists are set up, they can be viewed on the Port Order Screen. Lists are selected using the selection buttons on the right of the screen.



The "More Lists" button gives access to lists which have been set up on different "views" on the Options - Port Lists - Sort Lists screen. When selected, the ports in that list are displayed in alphabetical order in the main section of the screen.

Sets

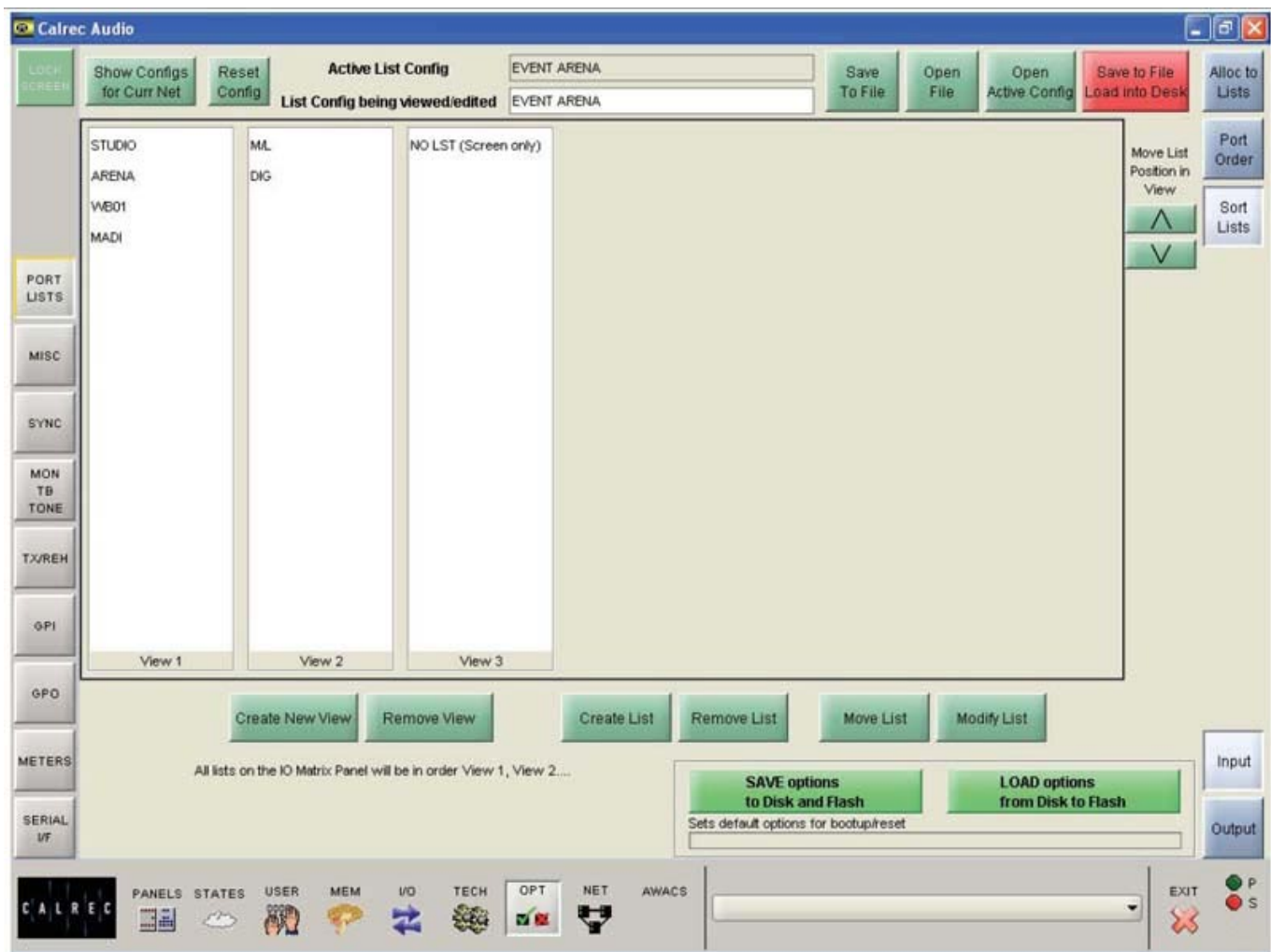
Ports within a list can be grouped into "sets" by selecting them from the list and selecting "Create Set". Sets remain together in the list. Ports within a set are sorted alphabetically, but can be moved into a different order using the nudge

arrow buttons. Each Set is given a number and ports belonging to different sets are highlighted in a different colour.

"Start Port Selection" allows a number of ports to be selected from the list. Once the required ports are selected, they can be added to a new set using "Create Set", or they can be added to an existing set using "Add to Set".

"Remove From Set" removes any selected ports from the set they occupy.

SORTING AND MANAGING PORT LISTS



This screen allows a number of list views to be created. List views allow the user to change the order the lists appear on the port selection controls and I/O patching screens, and control the accessibility of the lists.



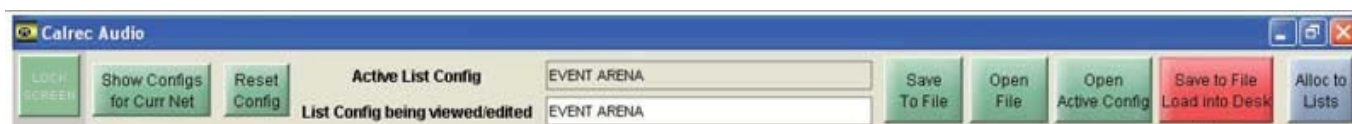
“Create New View” and “Remove View” allow list views to be created and removed. When a view is removed, any lists occupying it will move to previous view. “Create New List and Remove List” allow lists to be created and removed (once lists are removed from a configuration they are deleted permanently).

“Modify Lists” allows each list to be renamed, moved to a different view and set to be screen only. Screen only lists will be denoted as such.

On the I/O patching screens, all the lists in View 1 will be available for selection in the main patching area. Lists allocated to subsequent views will be accessed using the “More Lists” button on each I/O patching screen. Placing views under “More Lists” means that they are hidden from immediate view on the I/O patching screens. This ensures that only the relevant lists of ports are at the user’s fingertips during operation.

Lists appear on the port selection controls in the order View 1, View2, View 3 etc. The order of lists within a view can be shuffled using the nudge buttons on this screen.

SAVING AND RESTORING LISTS



Once the user has the lists 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.

The currently active configuration will be shown at the top of the screen, and the configuration currently being viewed/edited is shown in a box underneath.

When creating a new configuration, a name for it must be entered in this box. 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/lists. If any changes are made to the configuration, this button will light in red (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 allows a previously saved list configuration to be restored. When opened, the configuration is loaded into the screens as "the list configuration being viewed/edited", it is not sent to the console. When the configuration is ready to be used, select Save to File Load into Desk, and the configuration will be saved and the settings sent to the console.

Save to File

This button saves the configuration being viewed/edited without loading it onto the console.

Open Active Config

This button retrieves the settings that the control surface is using and displays them on the screens as the list configuration being viewed/edited. This allows amendments to be made.

Show Configs for Curr Net

This button allows list configurations which use the current network configuration to be opened.

Reset Config

This button clears the current list configuration of all its settings. All ports are transferred to the NO LST screen only list. A confirmation box must be accepted before this action is carried out.

Save Options to Disk and Flash

As the list configuration screens are part of the options set of screens, it is important to save the options to disk and flash once the list configuration is set up. Although the list configuration itself is saved separately, its active state on the console has to be saved using these buttons.



The Options screens are used to pre-set the system to the required settings. These settings are not stored in the individual console memories but are saved and loaded separately.

Changes to options take effect as soon as they are made, but, if they are not saved, the next time the desk boots up the options will revert to their previous settings. This could mean that a different list configuration is loaded onto the console, which 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.

SIGMA **ENGINEERING INFORMATION**

TECH SCREEN

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.



USER MODE 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”.

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

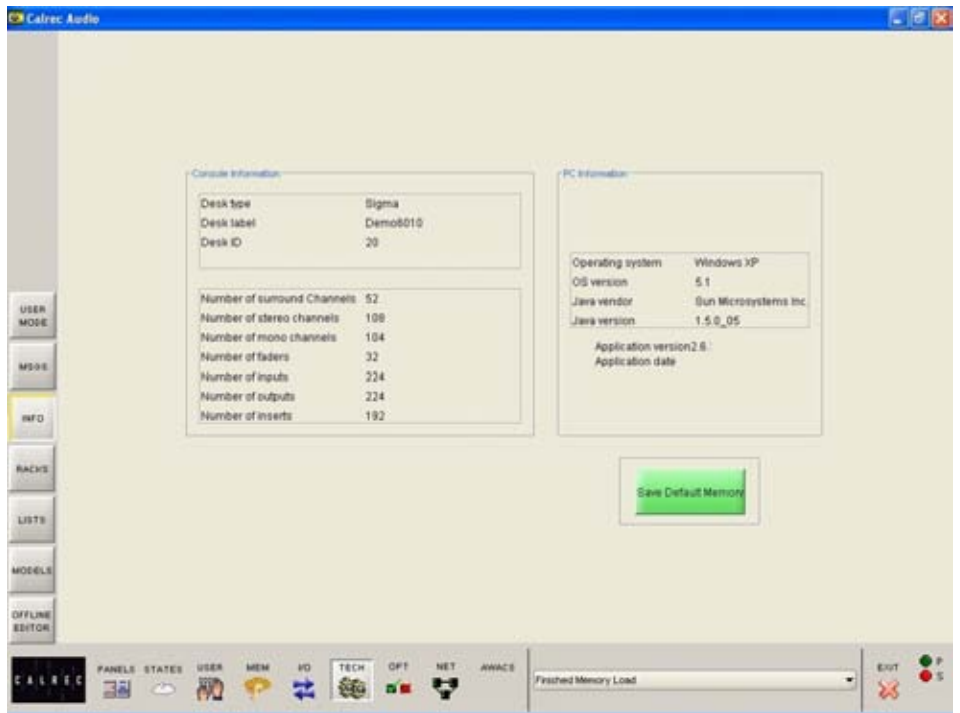
INFO The Tech-Info screen (shown below) displays system information and allows the Default Memory to be saved.

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

LISTS 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 are set up during installation, using the Setup Application.

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

OFFLINE EDITOR The Tech-Offline Editor screen allows the creation of an Offline Editor installer and saving/loading of console bundles. Full details of these features are described in ‘Appendix A - Offline Editor’.



Info Screen and Default Memory

The Default Memory will usually be created upon installation of the console using the button on this screen. This default memory could contain the input port set-ups which match the studio wiring, and settings for relays, optos, and running levels. It could have all channel settings off or flat, with no routes made, and could 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 Functions panel.

OPERATIONAL MODES

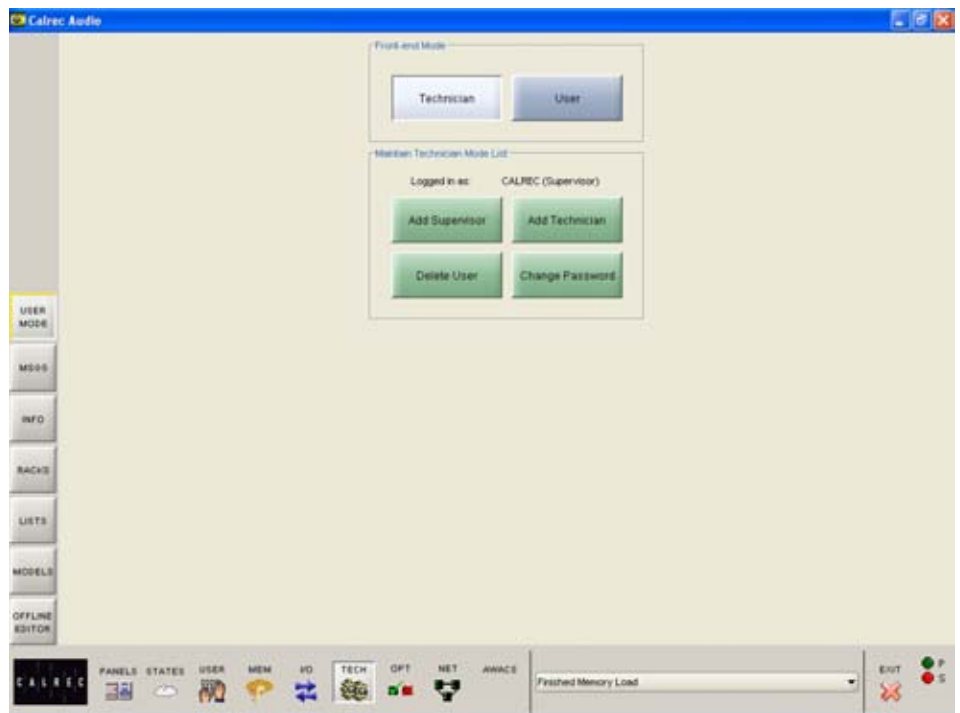
The console can be in one of three modes, “User”, “Technician” and “Supervisor”. Operation of certain screen functions is only available in “Technician” or “Supervisor” mode. These modes are password protected to add an extra layer of security. The TECH-USER MODE screen is used to log in and out of different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



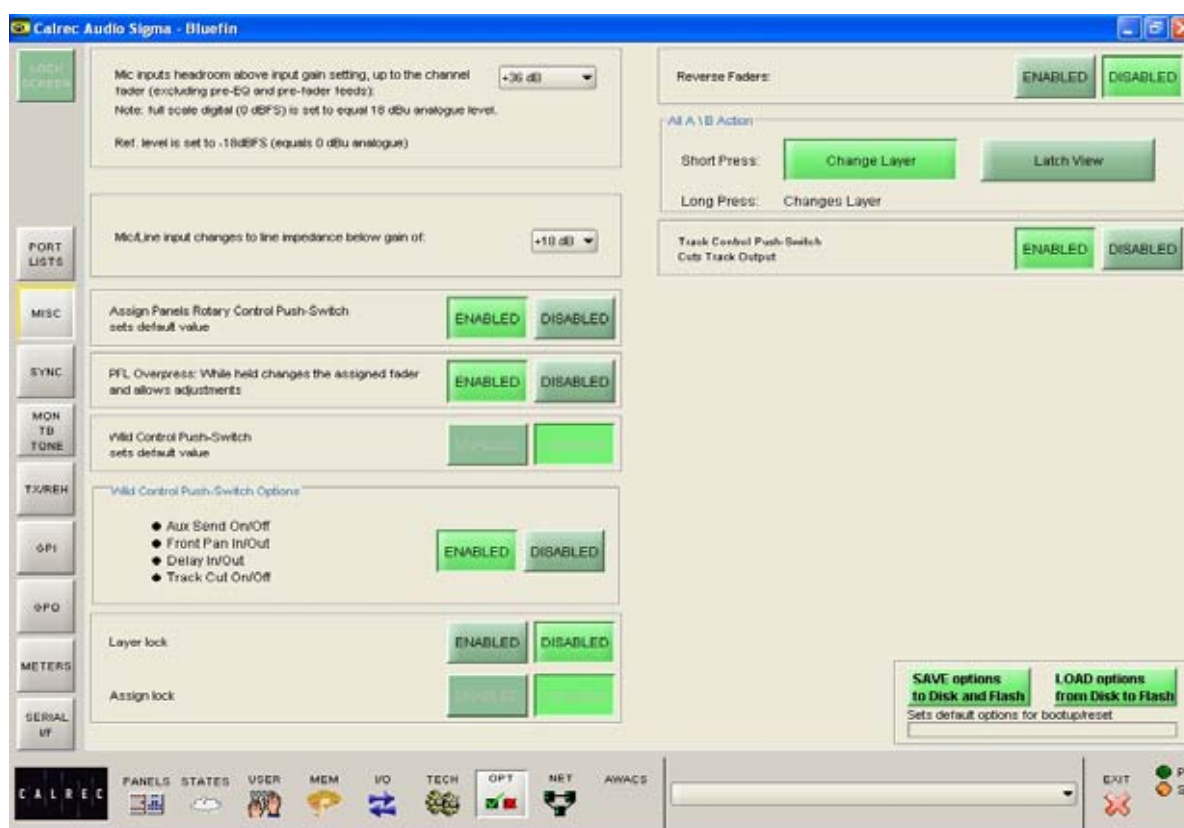
It is intended that all set-up procedures and configuration may be carried out and maintained by an engineer or technical operator.

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.



MISCELLANEOUS SCREEN



The Options - Misc Screen allows console functions to be enabled.



Mic input headroom

This is the headroom available above the input gain setting, up to the channel fader.

For example, if the input gain is set to 40 dB and the mic input headroom to 36 dB, the channel will handle up to -4 dB pre-fade. Post fade feeds can be kept below clipping by holding the fader back to -4 but this may cause clipping of pre-fade insert or pre-fade feeds to auxes, tracks, and direct outputs.

Selecting an excessive headroom value will compromise the noise performance, though this will not normally be noticeable.

Mic/Line input impedance

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

Assign panel rotary control push switch sets default value

Each rotary control incorporates a switch which is operated by pushing the control. This rotary control push-switch can be used to set the value of the control to its default. This feature is enabled and disabled using the buttons on this screen.

PFL overpress

When enabled, holding a fader in the PFL overpress mode causes that channel to become active on the assign panels. When the fader is released, the panels revert to the previously assigned fader.

Wild control push switches

Similar push switches to those on the assign panels exist on the Wild controls. If the Wild control push switch is enabled, pushing the wild control sets the default value. When disabled, an ON/OFF or IN/OUT status switch can be available for Aux Send, Input Delay or Front Pan controls if enabled in the field below.

Layer lock

This enables the Layer Locking function under the USER screens. Locked faders will not change between the A and B layers when the All A or All B buttons on the Assign fader are used.

Assign lock

As a step beyond the Layer lock above, the A/B layer switches of faders can also be disabled. If a locked button is pressed, it flashes rapidly.

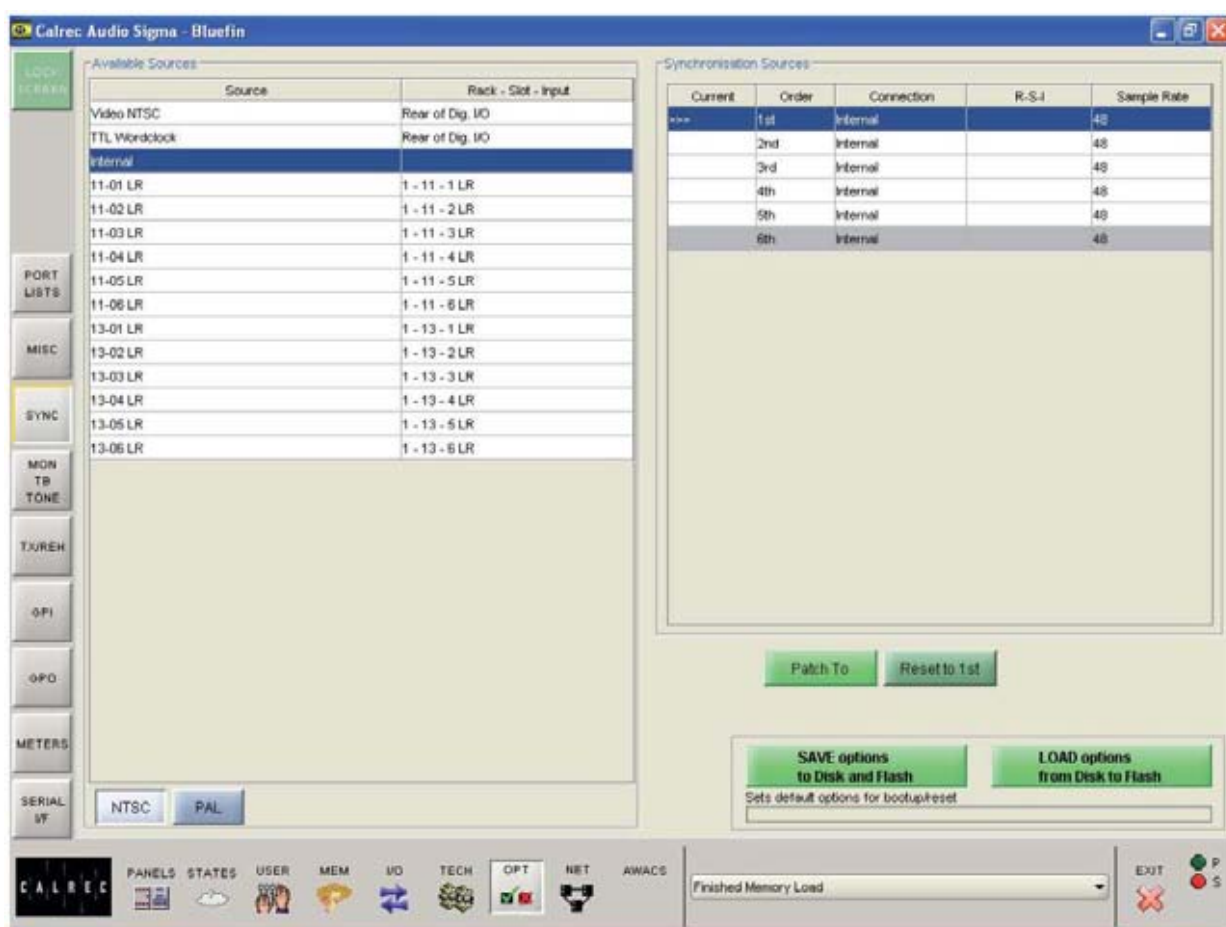
All A/All B button functions

These set the functionality for a short press of the All A and All B buttons on the assignable fader. A long press will switch all the channel faders to display either their A path or their B path permanently.

If set to change layer, a short press on the ALL A and ALL B buttons will switch all the channel faders to display either their A path or their B path permanently.

If set to "Latch View", a short press of an All A or All B button will display the paths on the control surface until the button is pressed again. This is so that the console's A/B display pattern is not lost and it will revert to the previously displayed layer on each fader when the All button is released.

SYNCHRONIZATION SCREEN



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 a digital input or wordclock as a source, the system will tolerate a variation of up to +/- 100 Hz in the frequency of the source.

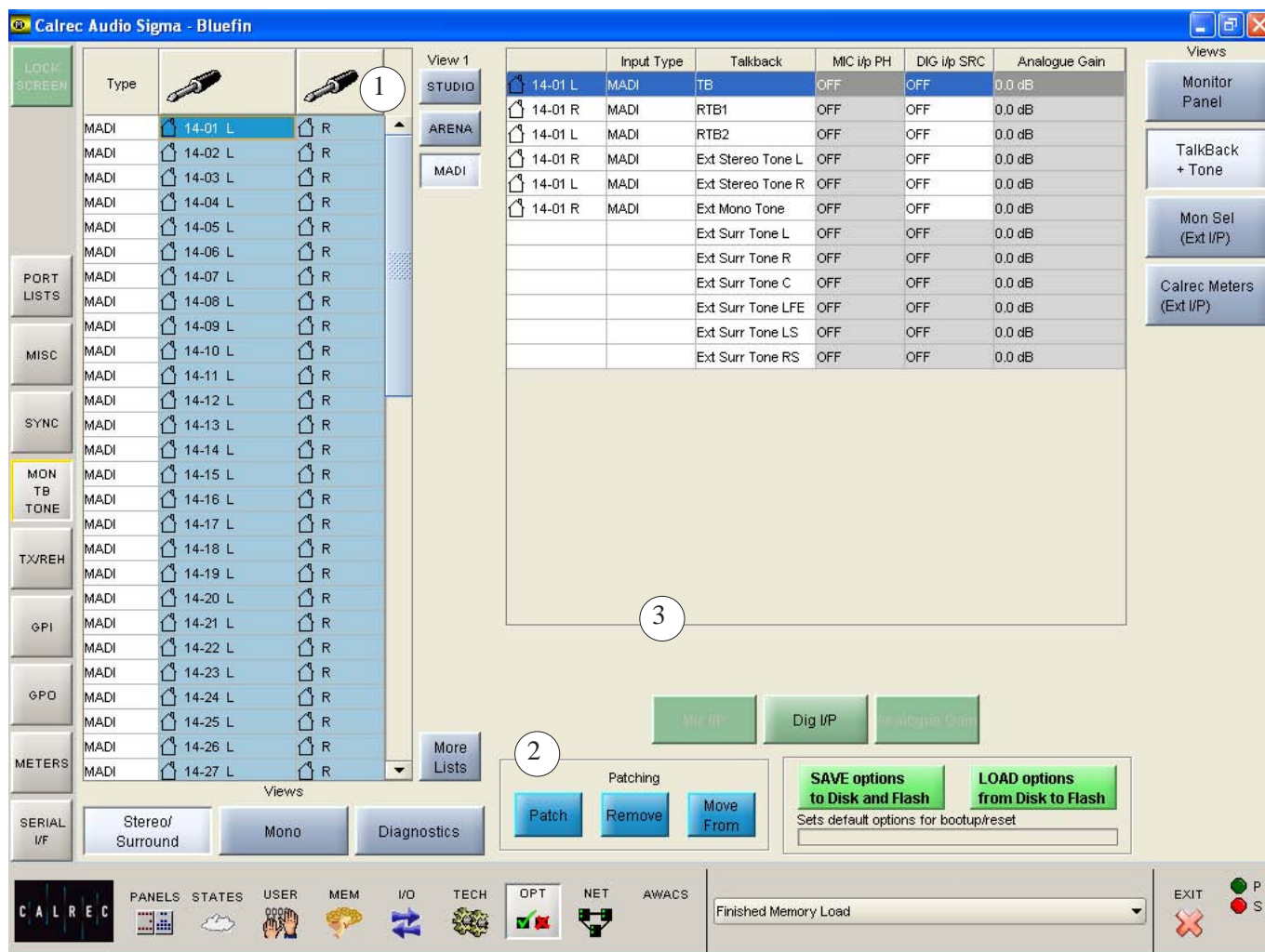
Assigning Synchronization Sources

Synchronization 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.

Reset to 1st

If the first source has failed, and the system is running on any of the selections 2 to 6, when the first source becomes available again, the system can be RESET TO 1ST during any convenient off-air period.

TALKBACK AND TONE INPUTS



The input sources for Talkback and Reverse Talkback are patched on this screen. The ports for the mono, stereo or 5.1 surround external tone inputs for use with the oscillator can also be patched here.



(1) Source Lists

Talkback and tone 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.

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).

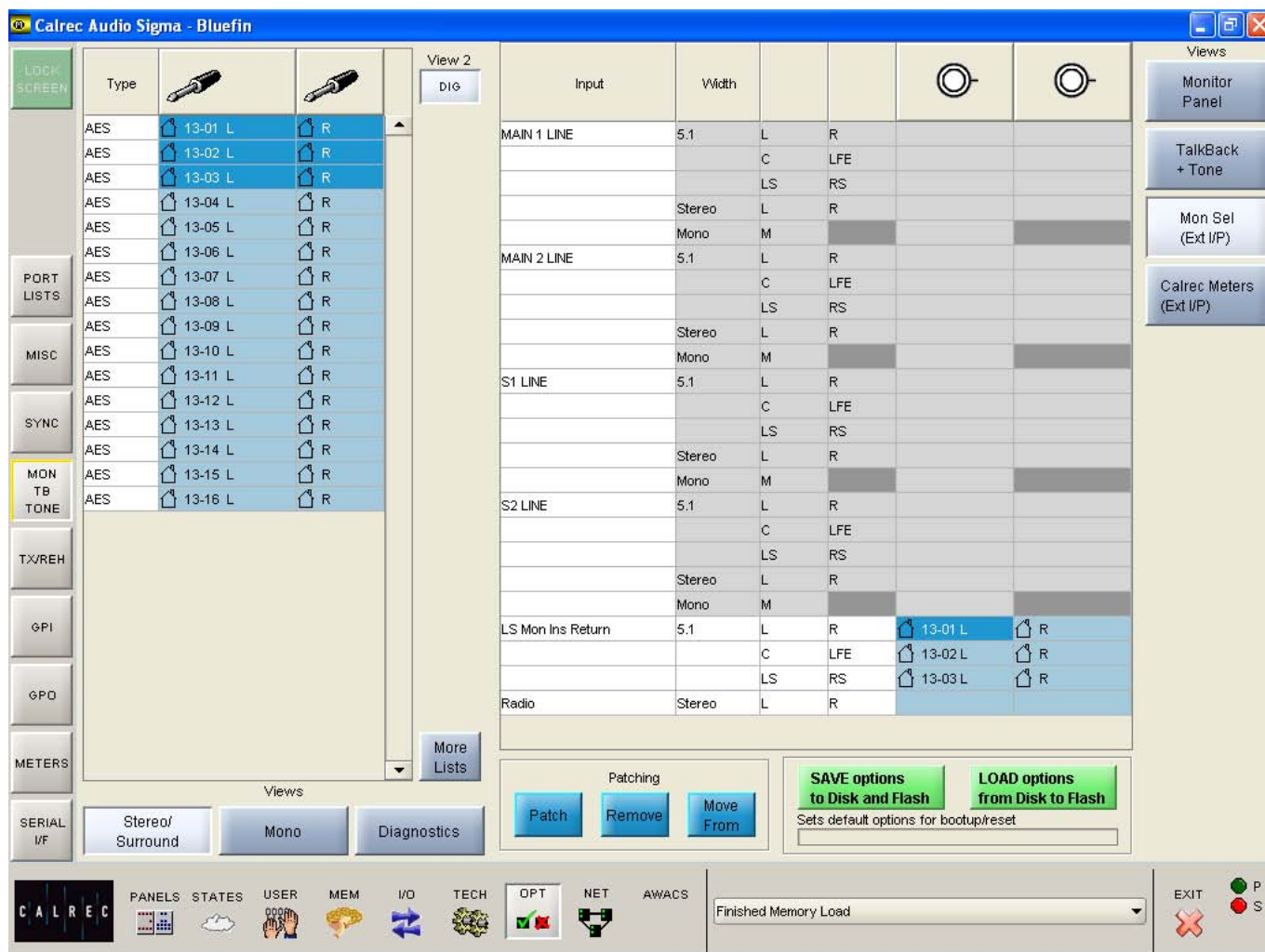
(2) Patching

The Talkback and tone inputs are listed in the main section of the screen. Assignment is made by selecting a source and an input, and selecting Patch.

(3) Parameters

The parameter buttons provide controls for analog gain control (coarse), Phantom Power (mic/line) and SRC switching for the input (AES). When selecting analog 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.



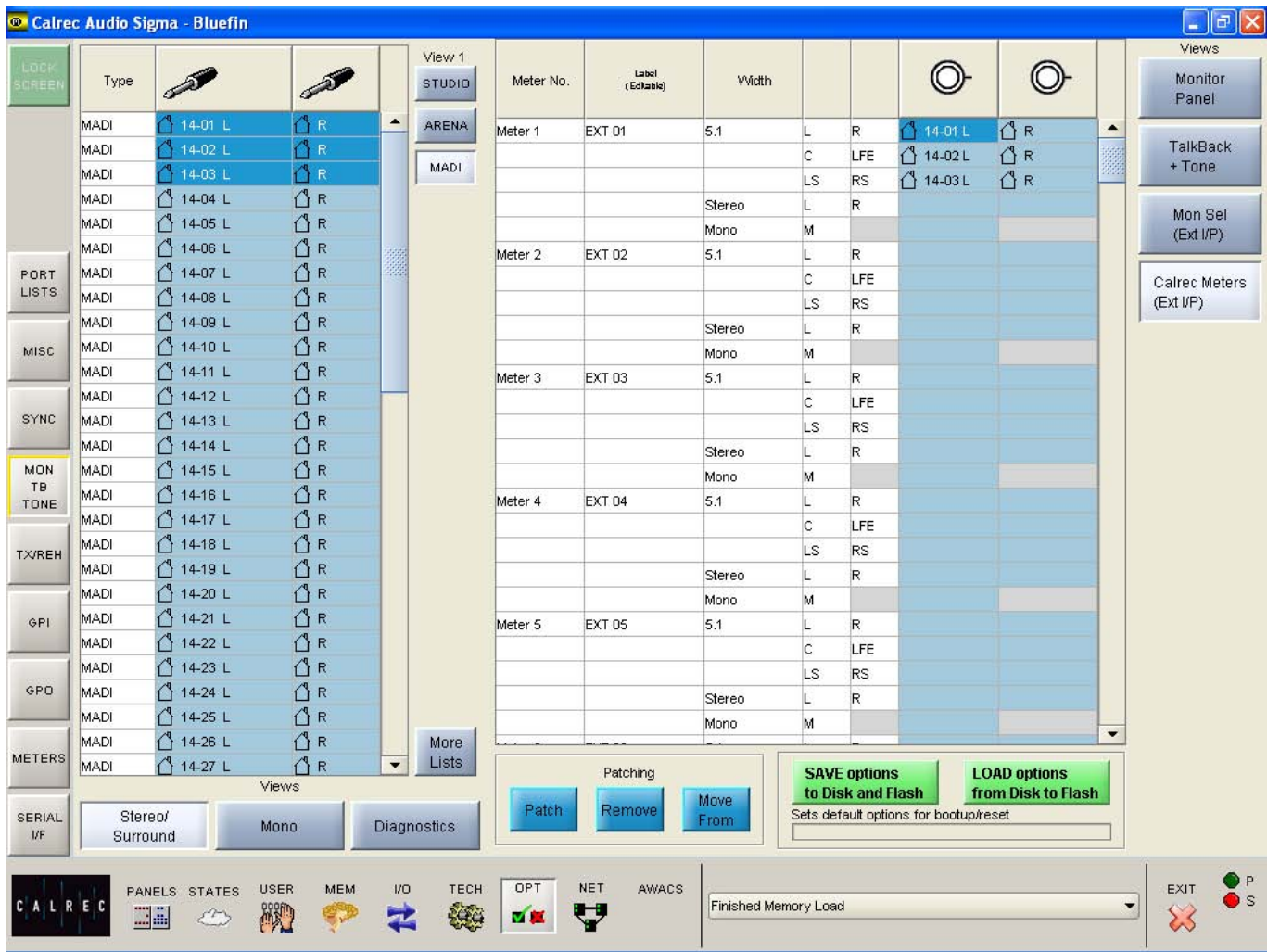
Return ports for the LS monitor insert are also patched here. The send ports are patched on the I/O - Outputs - Mon TB & Osc Screen. The LS monitor insert is switched in and out using the button on the monitor LS panel. When using the traditional style monitor panels, the LS monitor insert can be switched in and out on the States Screen in addition.

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 through the output ports.

External monitor input ports are selected from the lists in just the same way as channel inputs. 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 a source and a monitor input, and selecting Patch.

EXTERNAL METER INPUTS



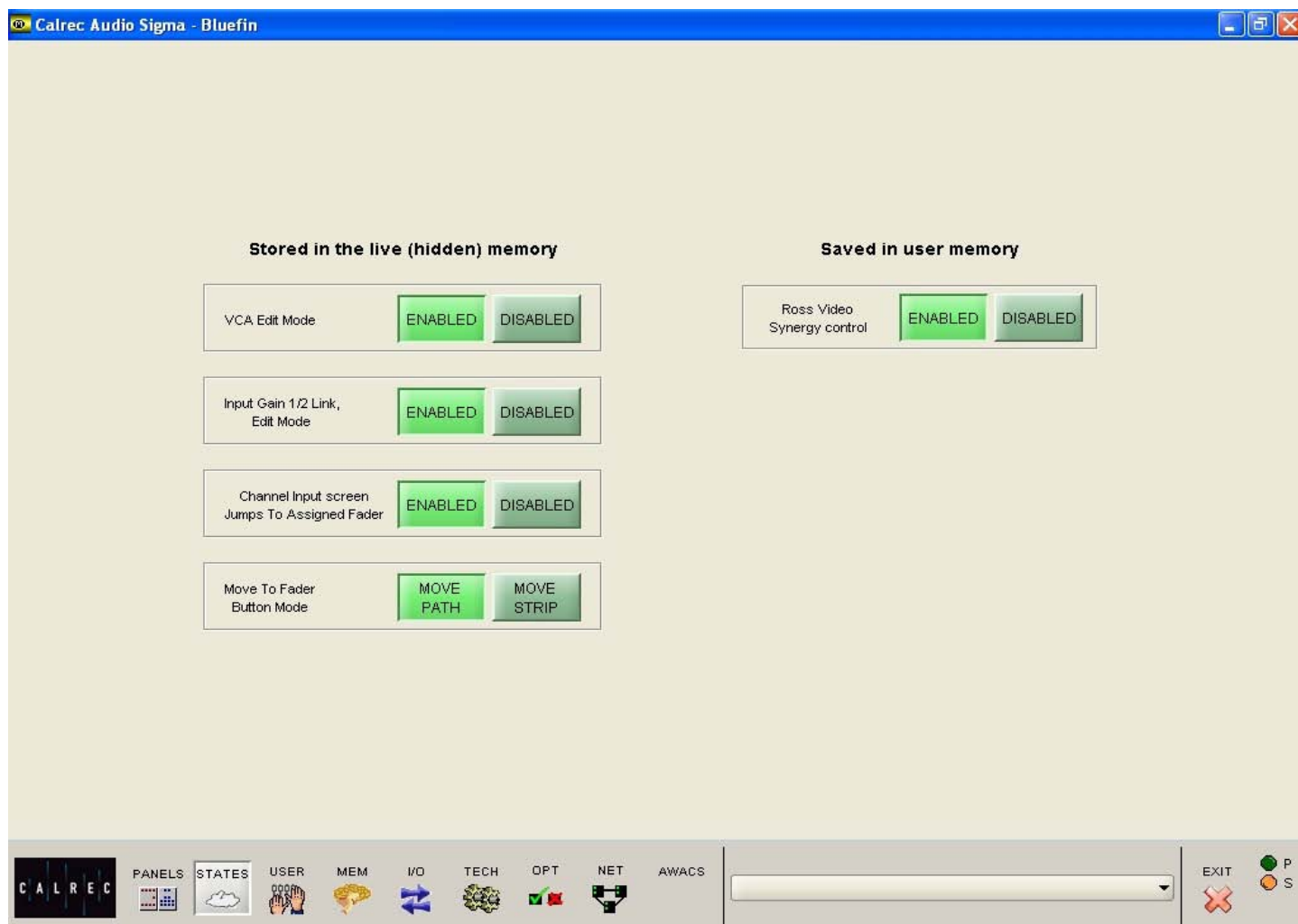
The input sources for external meters can be patched here in the same way that channel inputs are patched. There can be up to 64 external meter inputs, which are mono, stereo or 5.1 surround.



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.

STATES SCREEN



The States Screen allows different console behaviours to be enabled and disabled.



The options are in two groups. Those in the left column ('Stored in the live/hidden memory') remain are not affected by the console memory system. The one in the right column will be changed to whatever state it had when that memory was saved.

If your console uses the traditional style monitor panel, then there are additional functions available on this screen. Please refer to Appendix B at the end of this manual for details.

VCA Edit mode

Disabling provides protection against accidental changes to VCA groups.

Input 1 and 2 Gain Linking

Channels have two inputs and the gains can either be linked, or adjusted separately.

Channel Inputs Screen

If enabled, selecting a fader assign button causes the Channel Inputs patching screen to scroll to that fader in the patching list.

Move To Fader Button Mode

The Move Path buttons on the I/O Matrix panel can be set to move the selected path (A or B) to another fader; or they can be set to move the entire fader strip (both paths A and B). In both cases, any Wild control assignments will also move with the path.

Ross Video Synergy control

This allows a Ross Synergy 2 or 3 switcher, often under control from a Ross Overdrive automation system, to control the following functions:

- level of input/group faders
- fader ON/CUT status
- activate console PFL of those faders
- level of main output faders

CONDITION SWITCHING

LOCK SCREEN

PORT LISTS

MISC

SYNC

MON TB TONE

TX/REH

GPI

GPO

METERS

SERIAL I/F

Function	Tx (on air)	Reh	Neither
Opto 'On Air' overrides desk button	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Opto 'Reh' overrides desk button	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Track 1 TB inhibit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tracks 2-48 TB inhibit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Studio TB inhibit	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ext. 1 TB inhibit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ext. 2 TB inhibit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ext. 3 TB inhibit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ext. 4 TB inhibit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ext. 5 TB inhibit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ext. 6 TB inhibit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Main 1 TB inhibit	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Main 2 TB inhibit	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
S1 TB inhibit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
S2 TB inhibit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Groups direct o/p TB inhibit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Channels direct o/p TB inhibit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Main 1 tone inhibit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Main 2 tone inhibit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
S1 tone inhibit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
S2 tone inhibit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Groups tone inhibit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Groups direct o/p tone inhibit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chan 1 A tone inhibit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
All channels except 1 A tone inhibit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Turn chan tone off when select diff fader	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Turn group tone off when select diff fader	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Channel direct o/p tone inhibit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SAVE options to Disk and Flash

LOAD options from Disk to Flash

Sets default options for bootup/reset

CAL REC

PANELS STATES USER MEM I/O TECH OPT NET AWACS

Finished Memory Load

EXIT P S

This screen provides a mechanism for the system's condition switching 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 broadcast facilities panel 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 16 Relay isolated outputs are available on each GPIO 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.

The GPO screen allows the general purpose outputs to be set up.



“Misc Functions” or “Channel Fader Open”

The relay-isolated general purpose 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 output.

GPO Patching

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

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 - Relay is set to pulse when the function is activated.

Pulse Off - Relay is set to pulse when the function is de-activated.

Pulse Both - Relay is set to pulse once when the function is activated, and again when the function is de-activated.

Test

Correct operation of the device connected to a GP output can be verified by clicking on the Test button.

GENERAL PURPOSE INPUTS

LOCK SCREEN

PORT LISTS

MISC

SYNC

MON TB TONE

TX/REH

GPI

GPO

METERS

SERIAL I/F

Card	Opto	Simulate Opto	Opto Function Status	Sig. Req.	Console Function Connected
1	1	Test	●	Latch	Ext. 'ON AIR' signal
1	2	Test	●	Latch	Ext. 'REH' signal
1	3	Test	●	Latch	CR LS cut
1	4	Test	●	Latch	CR LS dim
1	5	Test	●	Latch	10-03 L CHANNEL CUT
1	6	Test	●	Latch	10-03 R CHANNEL CUT
1	7	Test	●	Latch	10-04 L CHANNEL CUT
1	8	Test	●	Latch	10-04 R CHANNEL CUT
2	1	Test	●	Latch	10-05 L CHANNEL CUT
2	2	Test	●	Latch	10-05 R CHANNEL CUT
2	3	Test	●	Latch	AUTO FADER 1
2	4	Test	●	Latch	AUTO FADER 2
2	5	Test	●	Latch	AUTO FADER 6
2	6	Test	●		
2	7	Test	●		
2	8	Test	●		

Opto Locking

Patching

Type	Function	Card	Opto	Sig. Req.
Ext. 'ON AIR' signal		1	1	Latch
Ext. 'REH' signal		1	2	Latch
CR LS cut		1	3	Latch
CR LS dim		1	4	Latch
DP570 Prologic				Latch
DP570 stereo				Latch
DP570 mono				Latch
DP570 phantom centre				Latch
DP570 3-stereo				Latch
DP570 custom				Latch
DP570 line				Latch
DP570 RF				Latch

Misc. funcs

Channel cut

Auto fade

SAVE options to Disk and Flash

LOAD options from Disk to Flash

EXIT

P

S

Up to 8 Opto isolated inputs are available on each GPIO card in the system. The GPI screen allows the general purpose inputs to be set up.



“Misc Functions”, “Channel Cut” or “Auto Fade”

Each opto-isolated general purpose input can be assigned to up to 10 console functions (with “Misc Functions” selected), or cut up to 10 channels (with ‘Channel Cut’ selected).

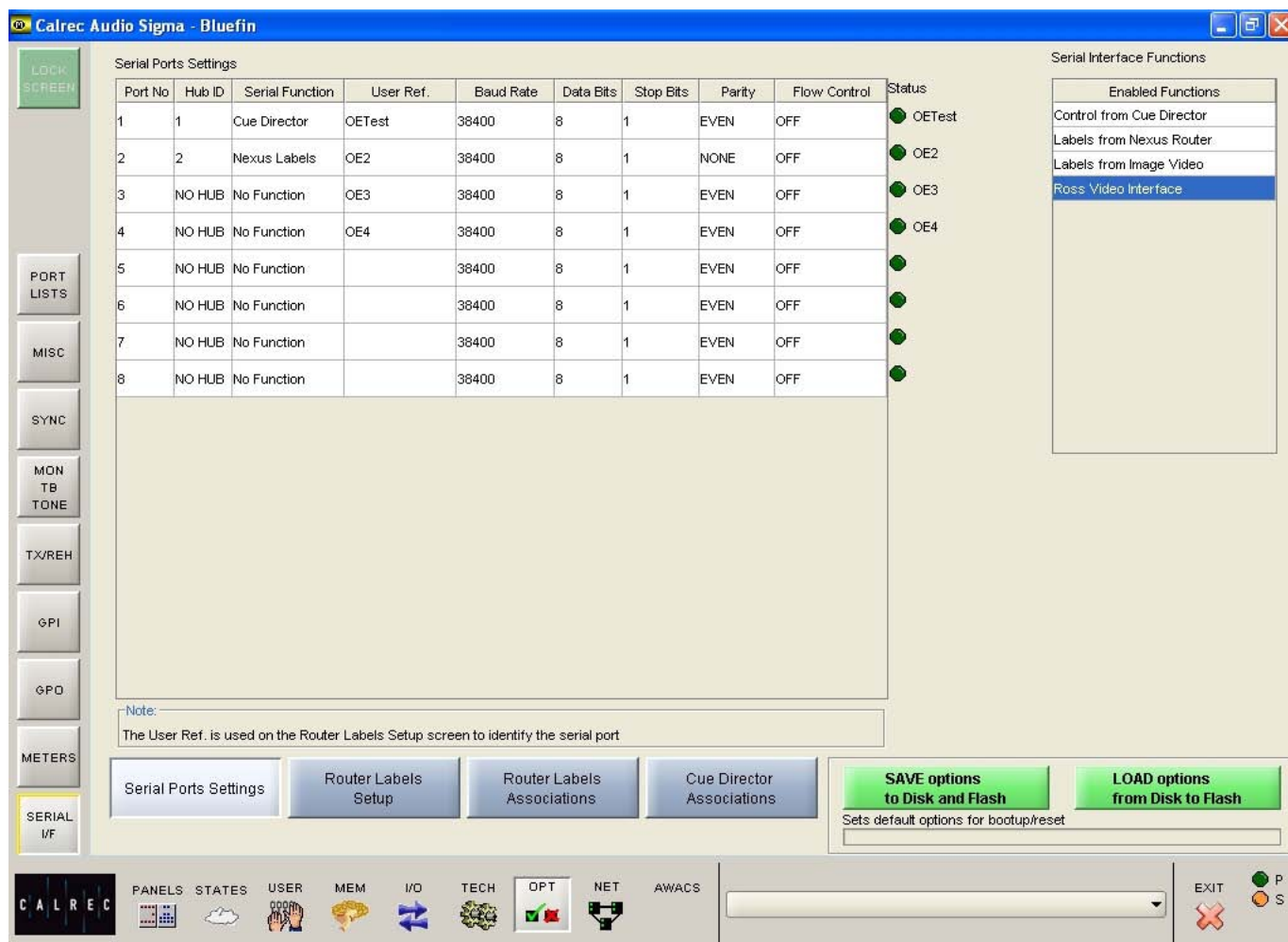
With Auto Fade selected, this screen allows general purpose inputs to be assigned to one of the console’s 32 Auto-Faders, to allow automatic cross-fading.

To make an assignment, select an 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. Once set up, opto assignments can be locked using the Opto Lock button, to prevent accidental removal.

After configuring a GP input, the correct functioning can be verified without the input hardware being activated. This is done by clicking on the Test button.

SERIAL INTERFACE



The serial port supports the following serial interfaces:

- **Cue Director**
- **Nexus Router**
- **TSI Image Video 1000**
- **Ross Video (Synergy 2 & 3)**

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

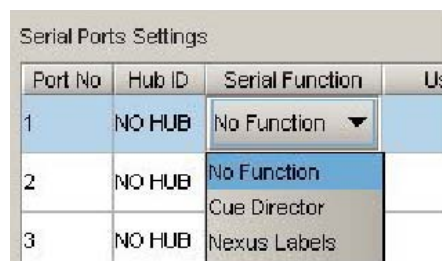
Serial Port Settings Screen

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

LOCK SCREEN

PORT LISTS

MISC

SYNC

MON TB TONE

TX/REH

GPI

GPO

METERS

SERIAL I/F

Labels From Routers

Label No	User Ref.	Label ID	Serial Port
1	NX1001	0	NX1
2	NX1002	1	NX1
3	NX1003	2	NX1
4	NX1004	3	NX1
5	NX1005	4	NX1
6	NX1006	5	NX1
7	NX1007	6	NX1
8	NX1008	7	NX1
9	NX2001	0	NX2
10	NX2002	1	NX2
11	NX2003	2	NX2
12	NX2004	3	NX2
13	NX2005	4	NX2
14	NX2006	5	NX2
15	NX2007	6	NX2
16	NX2008	7	NX2
17	NX3001	0	NX3
18	NX3002	1	NX3
19	NX3003	2	NX3
20	NX3004	3	NX3
21	NX3005	4	NX3
22	NX3006	5	NX3
23	NX3007	6	NX3
24	NX3008	7	NX3
25	NX4001	0	NX4
26	NX4002	1	NX4

Serial Interface Views

Serial Ports SettingsRouter Labels SetupRouter Labels AssociationsCue Director Associations

SAVE options to Disk and FlashLOAD options from Disk to Flash

Sets default options for bootup/reset

Interfaces

UNASSIGNNX1NX2NX3NX4

Notes:
The User Ref. is used on the Router Labels Associations screen to identify the label.
The Label ID should match the data being sent in the serial stream
The Serial Port can be set for several labels at once by selecting them and then pressing the appropriate interface button.

CALREC

PANELSSTATESUSERMEMI/O TECHOPTNETAWACS

Finished sending Meter

EXIT

P

S

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.

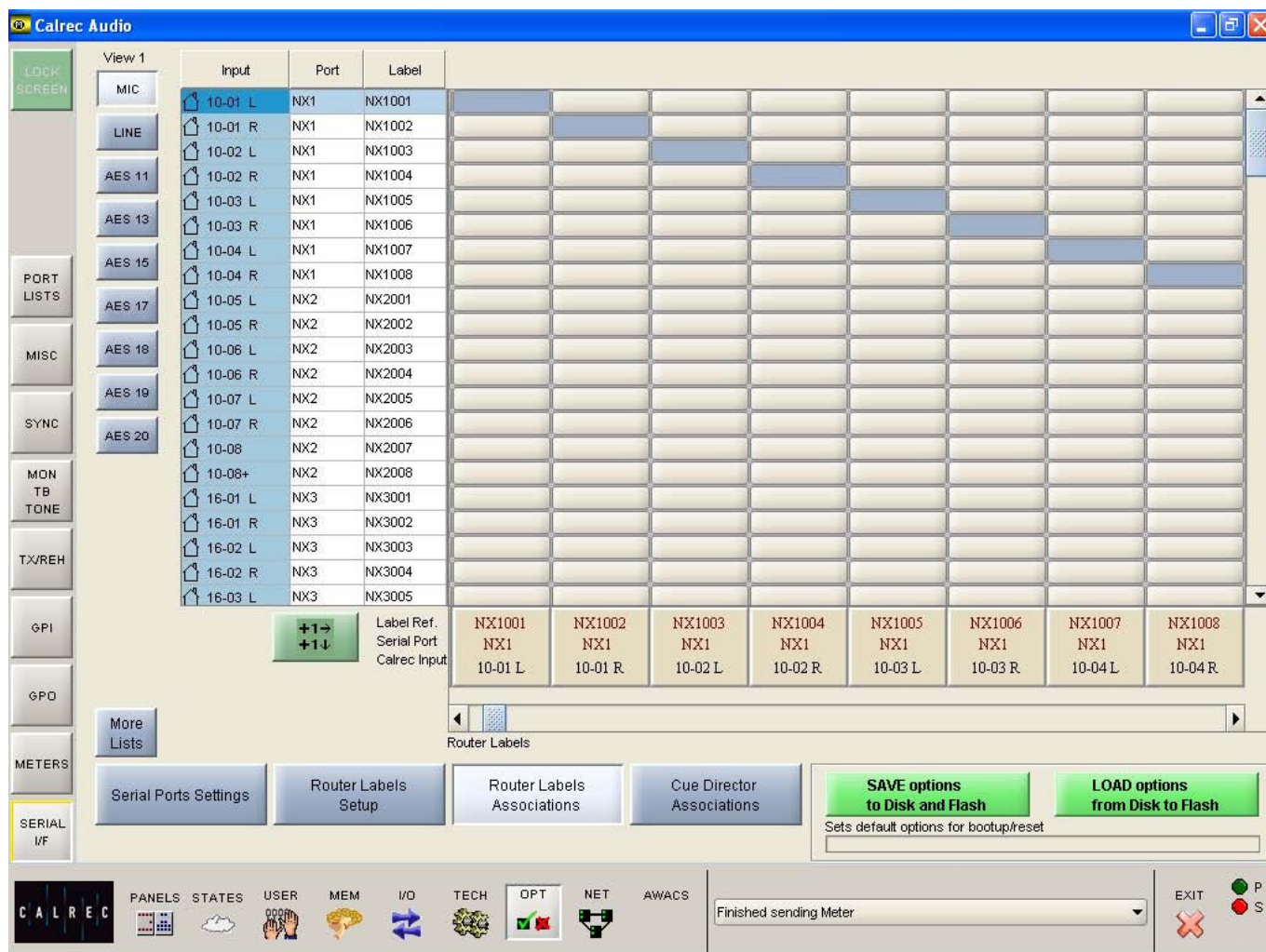
The console can support up to 256 Router labels. The Serial I/F - Router Labels Setup screen allows the link between messages from the router to be associated with one of the console's 256 labels.

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



The Serial I/F - Router Labels Associations 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.

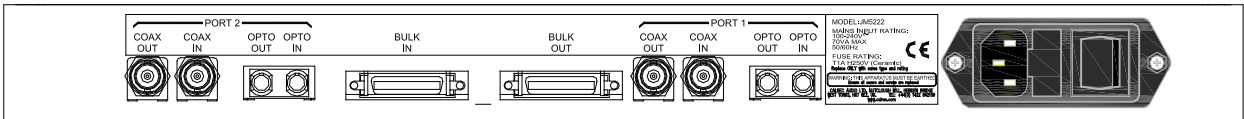
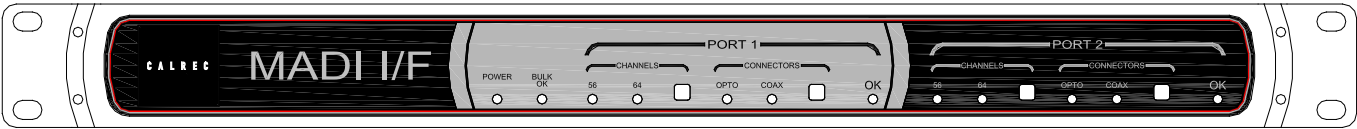
When an association is made, the cell will turn yellow. Associations can be unmade by selecting the cell again, whereby its colour will change back to grey. The +1 button is used to automatically move diagonally down the grid to the next

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.

FRONT



The rack mounted MADI unit contains two independent, AES10 MADI compatible interfaces.

The two ports are interfaced to the console via a Wide Area Bulk (WAB) card, which occupies one of the AES/bulk card slots in the Processing Rack.

Each MADI interface can operate in either 56 or 64 channel mode and can transmit over a coaxial AND optical medium and receive over a coaxial OR optical medium. A switch allows receiver selection.

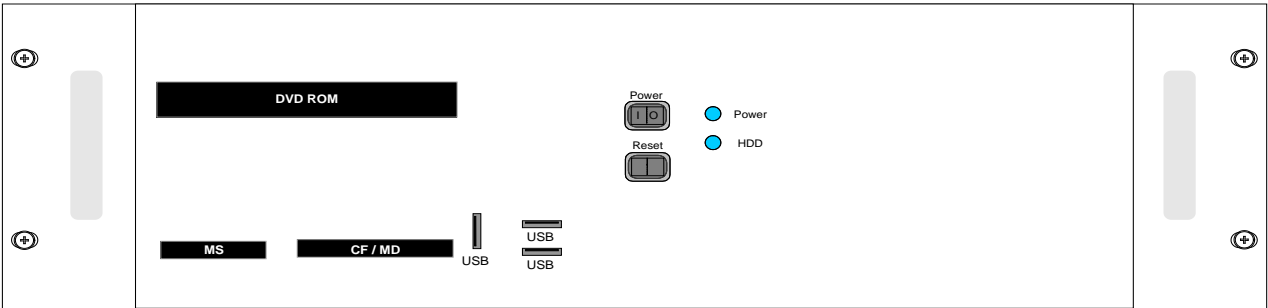
Sample Rate Conversion is not available on MADI inputs or outputs, therefore all equipment connected via MADI must be synchronised to the same source as the console.

Once set up, MADI inputs are viewed and patched on the console in the same way as AES inputs.

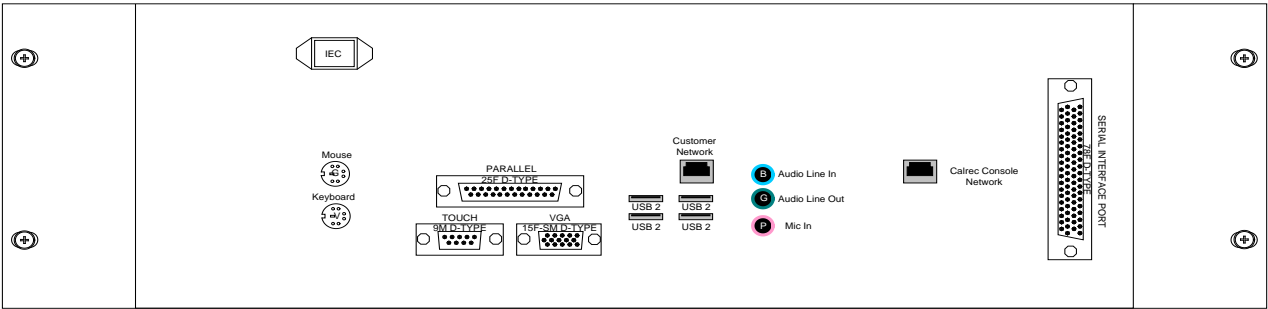
MADI Unit	Power	Fiber		Copper	
		Connection	Max Cable Length	Connection	Typ. Cable Length
JM5407	DC (24V)	ST - Multi-mode	2 km	BNC (75 Ohm)	<50 m
JM5418	AC (100-240V)	ST - Multi-mode	2 km	BNC (75 Ohm)	<50 m
JM5450	DC (24V)	SC - Multi-mode	2 km	BNC (75 Ohm)	<50 m
JM5451	AC (100-240V)	SC - Multi-mode	2 km	BNC (75 Ohm)	<50 m
JM5754	DC (24V)	SC - Single-mode	10 km	BNC (75 Ohm)	<50 m
JM5755	AC (100-240V)	SC - Single-mode	10 km	BNC (75 Ohm)	<50 m

Operating System	Windows XP
CPU	Intel Celeron Processor (2GHz+)
RAM	256 MB DDR RAM
HDD	40GB
CD ROM	52x
Network Ports	2 x 10/100
Card Slots	Compact Flash/Microdrive, SmartMedia, Memory Stick, Secure Digital/Multimedia Card
USB 2 Ports	4 (Rear of Unit), 1 (Front of Unit)
IEEE1394 Port	1 (Front of Unit)
Additional Hardware	8 Port Serial Card

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.

Local Network

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.

Hydra Network Connection

A Gigabit 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.

Username and Passwords

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

Username: CalrecAudio
Password: (none)

This user can install and run programs, but cannot change PC hardware settings (i.e. set up network, install drivers. It is recommended that this user is used during normal operation.

Username: CalrecAudioAdmin
Password: calrec

This user has full rights to the PC and can install and change PC hardware settings. It is recommended that this user is used during configuration of the PC and the setup of Hydra Audio Networking.

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 system will automatically back up these files to a user-specified drive, if it is set to do so. This is done using the Set-up Application.

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 inoperable, 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	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.
C:\Sigma\Cust1\Lists	This is the default location for the user-definable port list configurations. You should keep a backup copy of the files in this folder.
C:\Sigma\Cust1\Router	This is the default location for any router configurations made using a serial interface. If your console uses these, you should also keep a backup copy of the files in this folder.
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.

SIGMA **HYDRA AUDIO NETWORKING**

Gigabit Ethernet is founded on key principles of preceding Ethernet technologies and provides a data rate of 1000 Mbps over copper or optical fiber.

Audio and control data is transferred using the Ethernet frame format over switched media in a network constructed from standardized structured cabling.

Hydra I/O boxes providing fixed or configurable I/O may be connected onto the network, providing remotely located sources and destinations that can be used by any or all mixing consoles.

The Hydra Audio Network fabric is constructed using low-cost off-the-shelf hardware. The network topology is similar to that of an office LAN, being created out of a central Gigabit switch with connections to each mixing console and Hydra I/O box, in a star formation. Connections may be made with Category 5e UTP, up to 90 metres, or with optical fiber, up to 10 kilometres.

Hardware

There are many commercially available Gigabit switches, repeaters and media converters that can be used to build the network, however some proprietary hardware is required to interface the consoles and Hydra I/O boxes to the network.

The diagram below shows a console and racks connected to a network via a Wide Area Bulk Card and Hydra Gigabit interface unit. 3 Hydra I/O boxes and 2 modular Hydra I/O boxes are also shown, each with up to 96 inputs/outputs available to any console on the network.

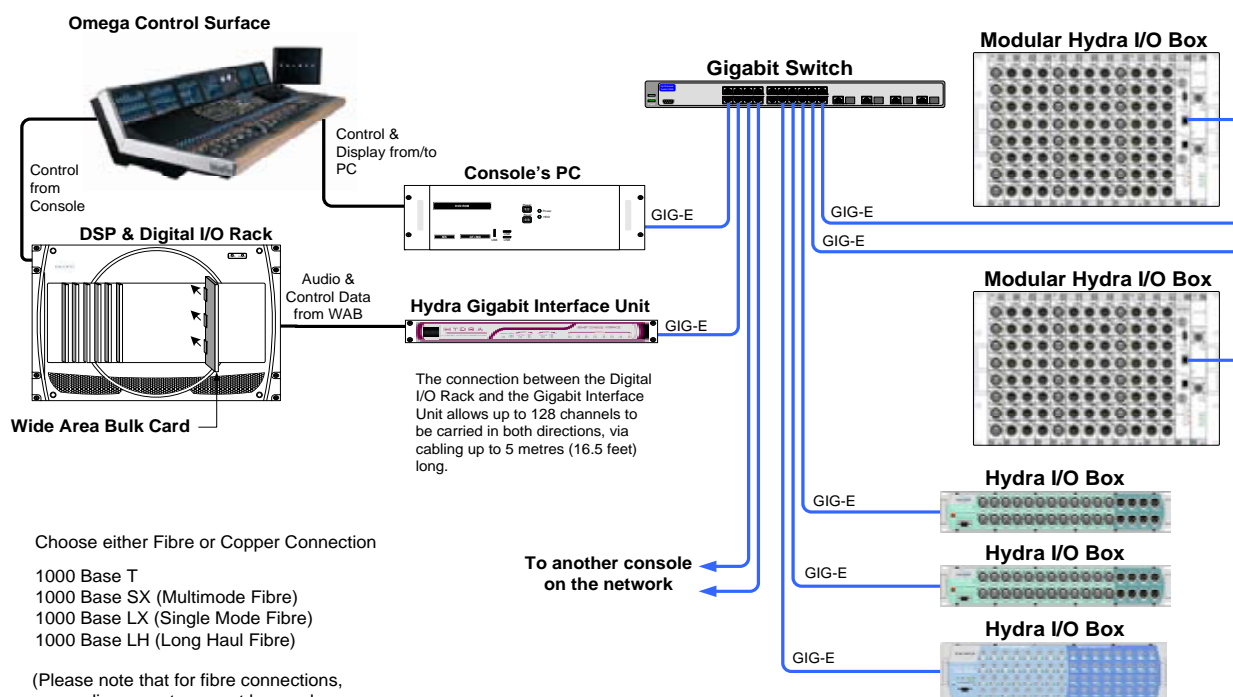
Network Editor

For a network to be truly useful, it must be easy to use and maintain. The system's control software constantly monitors the network, performing essential administration functions, leaving the user free to creatively exploit network resources as easily as if they were locally connected.

The console's Network Editor consists of a set of screens for :

- Configuration of modular Hydra I/O boxes
- Off-line editing of Hydra I/O and Audio Network
- Status representation of all devices on the network
- Utility for forcing ownership to be dropped

The Network Editor can be run independently of the console via the Offline Editor. This allows the modular Hydra I/O boxes and audio network to be configured off-line. Any operations which require a console however are disabled.



Choose either Fibre or Copper Connection

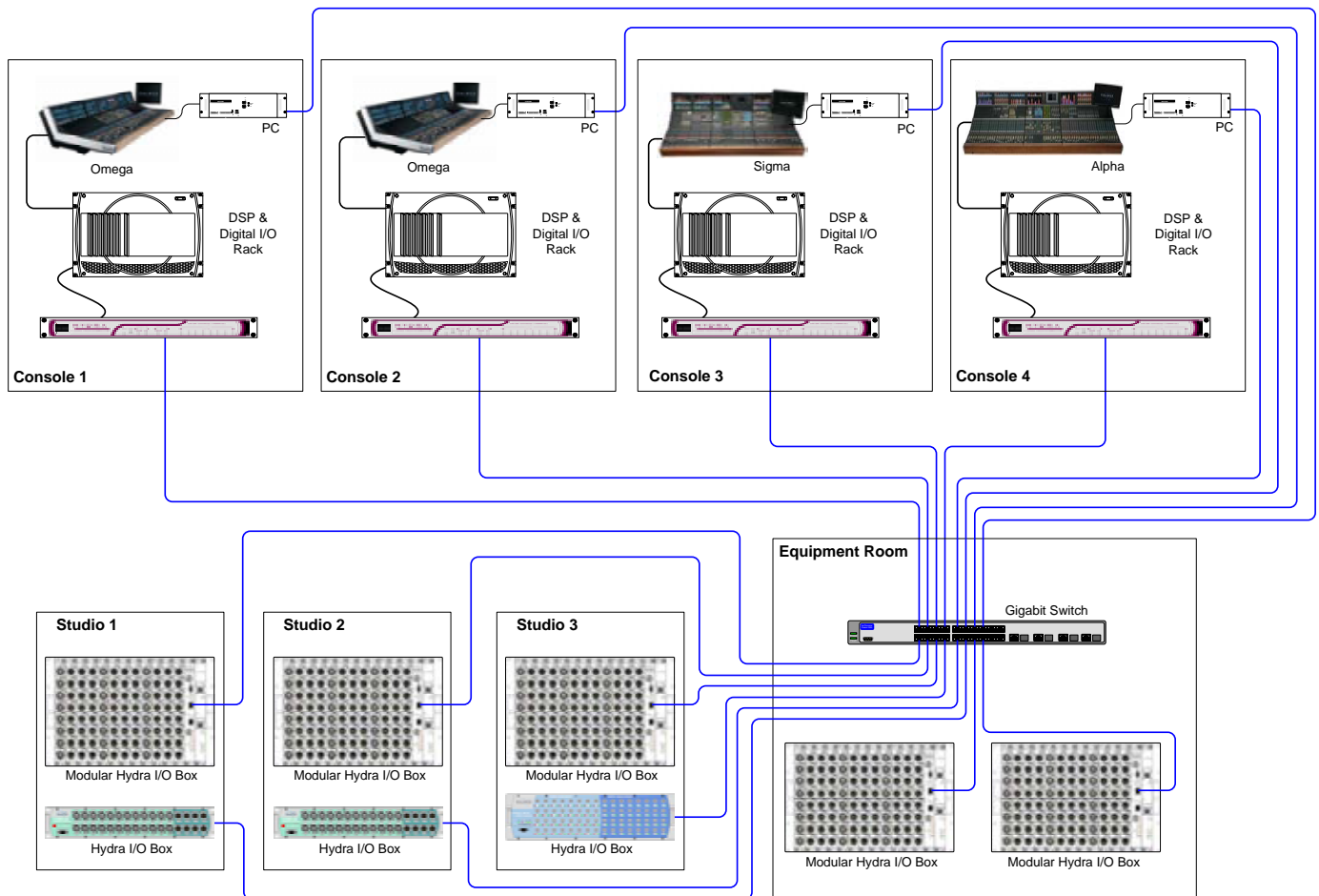
- 1000 Base T
- 1000 Base SX (Multimode Fibre)
- 1000 Base LX (Single Mode Fibre)
- 1000 Base LH (Long Haul Fibre)

(Please note that for fibre connections, media converters must be used between the Gigabit switch and the Modular Hydra I/O Boxes)

Please Note

Connections to the modular Hydra I/O box are via RJ45 connectors on the front of the unit's processor module. As this is a copper interface, when using fiber cabling, it is necessary for media converters to be used between the Gigabit switch and the modular Hydra I/O boxes.

TYPICAL HYDRA NETWORK EXAMPLE



The above diagram shows 4 control rooms, each with a Calrec digital console. The Gigabit interface unit for each console transmits and receives audio data to and from the Hydra I/O boxes, via a Gigabit switch located in the Equipment Room.

The console racks and Gigabit interface unit could also be in the Equipment Room if this was more suitable.

Synchronisation

Consoles sharing sources must be synchronized (e.g. to station sync or video). The Hydra I/O boxes synchronise to the

console Gigabit interface with the lowest IP address on the network.

Private Network

In order to guarantee fully deterministic performance, it is necessary to apply the restriction that the network must be kept private. This means that it must not be made to carry any data other than that generated by the audio network.

Local I/O

Local I/O in the console's own racks can be used for connections to routers, monitoring, talkback, inserts, etc. It is not networked to the other consoles.

HYDRA I/O BOXES

Status LEDs

The following indicative LEDs are visible from the front panel:

- PSU OK (green)
- Fan Fail (red)
- Port 1 connected (yellow)
- Port 1 active (green)
- Port 2 connected (yellow)
- Port 2 active (green)
- Status (x 8 red)

In addition, each input connector has its own tricolour LED to indicate signal presence. The incoming signal will cause the LED to light green when the signal is between -60 dBFS and -38 dBFS, amber when between -38 dBFS and -2 dBFS, and red when the signal clips at -2 dBFS or above.

Each output connector has a green LED to indicate that there is a route established to it from a console on the network.

Synchronization

Units are frequency synchronised using synchronization packets received from the Hydra network.

Diagnostics

The units support remote FPGA firmware and software updates across the network via the Ethernet ports. In addition, an RS232 port is provided, such that system diagnostics can be performed by a Calrec approved engineer. Connection to the port is via a front-mounted 9 pin D-Sub connector.

IP Addresses

Calrec will supply each device in your system with its own unique IP address, which the system uses to identify each network connection. On the front of each Hydra I/O box, there is a label showing the IP address. The secondary port will use the address of the primary port + 100 decimal. For example:

Primary Port 192.168.0.050
Secondary Port 192.168.0.150

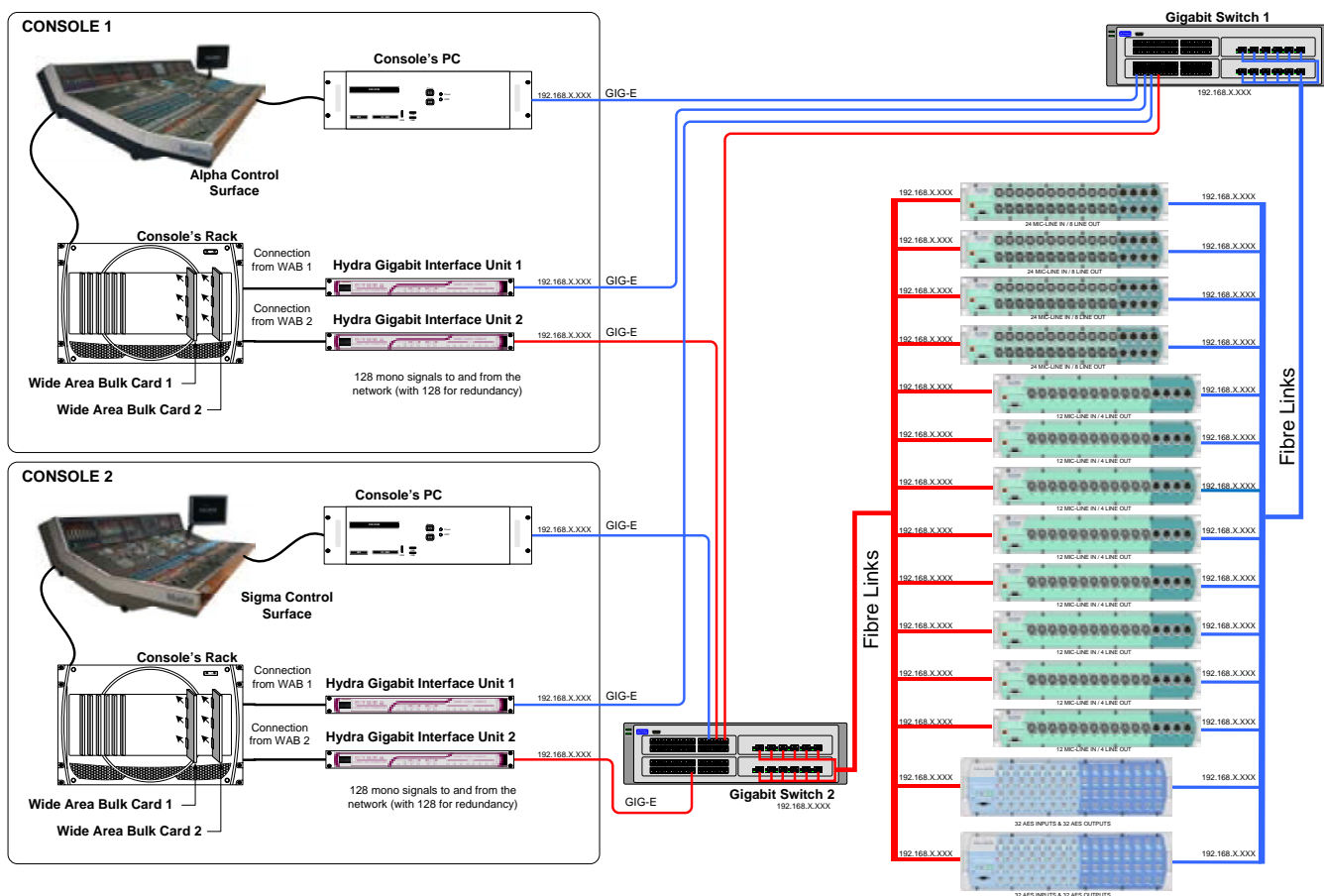
In an installation, the first 3 bytes (shown in red) are fixed. The 4th byte or least significant byte is the part of the address which is unique to that port on the device.

For mobile installations, the 3rd byte of the IP address will be unique to that installation, such that it is possible for different installations to connect their networks together.

If a Hydra I/O box needs to be swapped out, the replacement unit must be programmed with the correct IP address. The 8 way switch on the rear of the unit allows the least significant byte of the IP address of the primary port to be set in binary.

Surround Signals

It is not recommended that ports on a modular Hydra I/O box should be combined with ports on a fixed Hydra I/O box to create a 5.1 surround signal.



FIXED FORMAT BOXES

These robust, self-contained boxes can provide audio input and output facilities for use in areas such as:

- Equipment Room Rack
- Studio Wall Box
- Studio Gantry / Lighting Grid
- Control Room Rack
- Outside Broadcast Truck
- Outside Broadcast Flight Case

Variants

Units are available in the following variants:

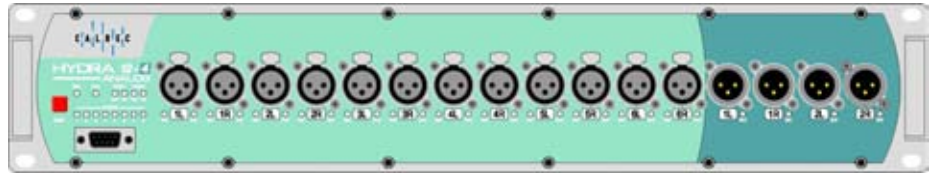
- 12 mic/line inputs and 4 line outputs (XLR)
- 24 mic/line inputs and 8 line outputs (XLR)
- 48 mic/line inputs and 16 line outputs (XLR)
- 32 AES inputs and 32 AES outputs (BNC)
- 4 SDI inputs with 'thru' connectors (rear panel connections)

The units connect to the network via an Ethernet port on the rear of the unit. Each unit has two identical ports to provide network redundancy. All versions are supplied with two RJ45 ports for copper connections (1000BASE-T for distances up to 90 m = 290 feet). In addition, plug-in GBIC modules allow connections with 1000BASE-SX (for distances up to 550 m) and 1000BASE-LX (for distances up to 10 km) are available.

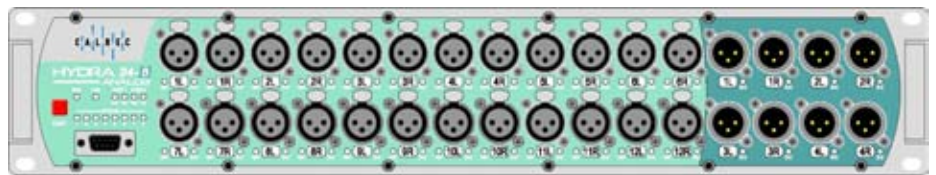
All external connections to the units are hot pluggable. If more than one media type is detected, the system will switch to fiber as its connection.

Hydra networks can include all versions forms of modular and fixed format boxes, though signals from SDI boxes can only be patched to consoles using Bluefin DSP systems or running software 1:36 or later.

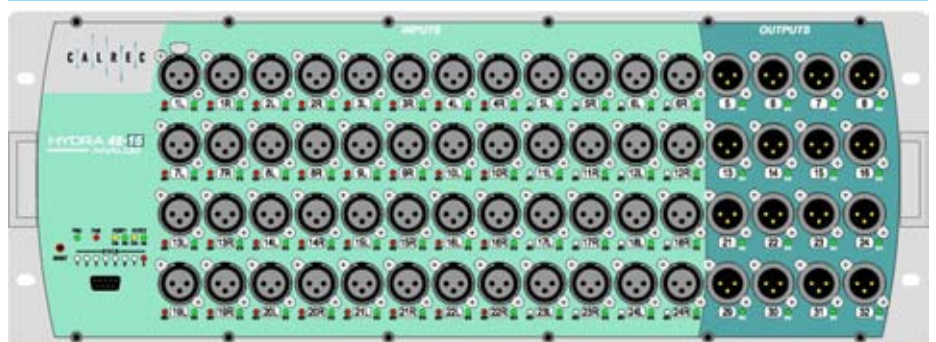
12 MIC/LINE IN & 4 LINE OUT (AD5608)



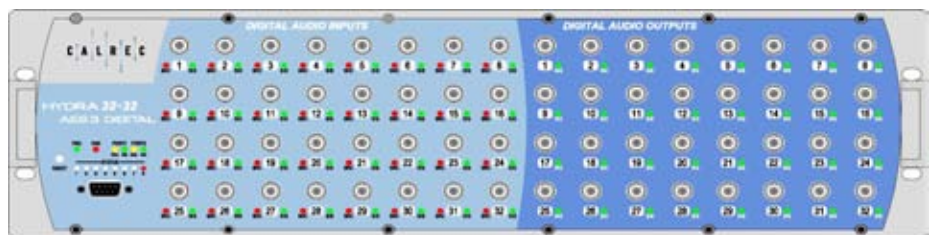
24 MIC/LINE IN & 8 LINE OUT (AD5603)



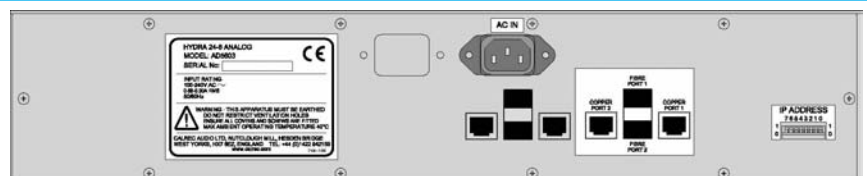
48 MIC/LINE IN & 16 LINE OUT (AD5600)



32 AES IN & 32 AES OUT (JB5607)



REAR CONNECTORS (SIMILAR FOR ABOVE UNITS)



DIMENSIONS & WEIGHTS

Unit	Height	Width		Approx Depth (incl. mating cons)		Approx Weight		Input Power Rating	Acoustic Noise (dB-SPL A-Weighted 1M from source)
		Inches	mm	Inches	mm	lbs	kgs		
AD5603 24 mic/line in & 8 line out - XLR	2U	19	483	12	300	12.5	5.7	100-240V AC ~ 0.58-0.30A RMS 50/60Hz	26
AD5608 12 mic/line in & 4 line out - XLR	2U	19	483	12	300	11.5	5.2	100-240V AC ~ 0.42-0.23A RMS 50/60Hz	26
AD5600 48 mic/line in & 16 line out - XLR	4U	19	483	12	300	16.1	7.3	100-240V AC ~ 1.0-0.48A RMS 50/60Hz	27
JB5607 32 AES in & 32 AES out - BNC	3U	19	483	12	300	12.0	5.8	100-240V AC ~ 0.38-0.20A RMS 50/60Hz	27

Power and Redundancy

The units are mains powered and have two internal power supply units, providing PSU redundancy.

As standard, one IEC input connector is fitted to power both internal PSUs. Versions of each unit (with the 'P' suffix after the unit number, for example AD5600P) provide a second IEC inlet. The twin IEC approach supports mains supply redundancy, as well as internal power supply component redundancy.

The units incorporate a cooling fan module. Each PSU module and the fan module within the unit are monitored to ensure proper performance. PSU OK and FAN FAIL indication is provided on the front of the unit.

Status LEDs

The following indicative LEDs are visible from the front panel:

- PSU OK (green)
- Fan Fail (red)
- Port 1 connected (yellow)
- Port 1 active (green)
- Port 2 connected (yellow)
- Port 2 active (green)
- Status (x 8 red)

In addition, each input connector has its own tricolour LED to indicate signal presence. With analog signals the incoming signal will cause the LED to light green when the signal is between -60 dBFS and -38 dBFS, amber when between -38 dBFS and -2 dBFS, and red when the signal clips at -2 dBFS or above.

Each output connector has a green LED to indicate that there is a route established to it from a console on the network.

Synchronization

Units are frequency synchronized using synchronization packets received from the Hydra network.

Diagnostics

The units support remote FPGA firmware and software updates across the network via the Ethernet ports. In addition, an RS232 port is provided, such that system diagnostics can be performed by a Calrec approved engineer. Connection to the port is via a front-mounted 9 pin D-Sub connector.

Surround Signals

It is not recommended that ports on a modular Hydra I/O box should be combined with ports on a fixed Hydra I/O box to create a 5.1 surround signal.

SDI BOXES

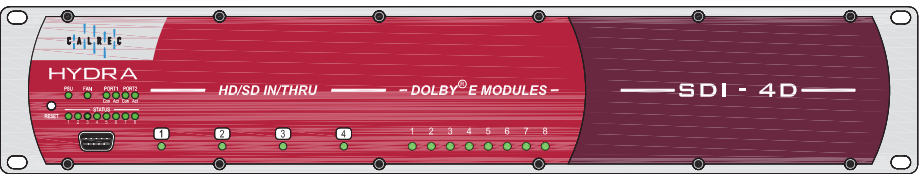
Calrec SDI de-embedders are available in four and eight way versions, each SDI stream providing up to eight stereo output pairs. Up to 33 SDI boxes can be used in a Hydra network (up to 9 if using pre V2.8 software).

The SDI boxes are available in four way (VI5699) and eight way (VI5698) versions, both supporting HD (high definition) and SD (standard definition) video. Both units may be fitted with a secondary IEC inlet for redundant external AC power.

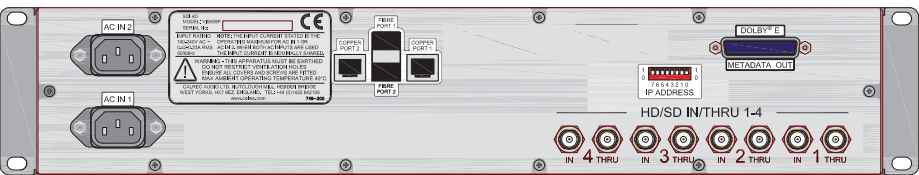
The four way version can be fitted with up to eight optional Dolby E decoder modules. An extra rear connector is provided with this option for accessing Dolby E metadata.

As with the analog and AES-3 boxes, these SDI interfaces connect to the network via an Ethernet port on the rear of the unit. Each unit has two identical ports to provide network redundancy. All versions are supplied with two RJ45 ports for copper connections (1000BASE-T for distances up to 90 m = 290 feet). Plug-in GBIC modules allow connections with 1000BASE-SX (for distances up to 550 m) and 1000BASE-LX (for distances up to 10 km) are available.

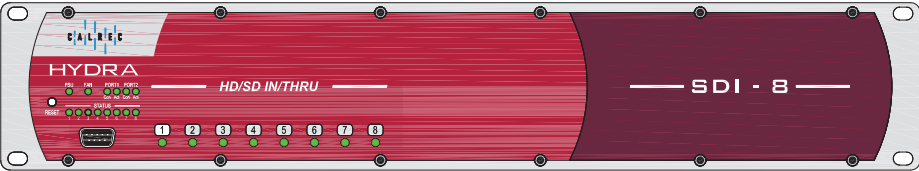
4 SDI IN & PASS THROUGH WITH OPTIONAL DOLBY DECODERS (VI5699)



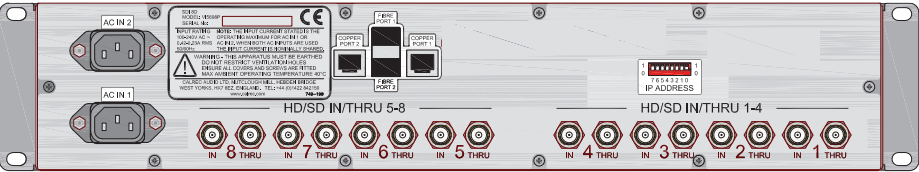
4 SDI IN & PASS THROUGH (VI5699, NOTE THE EXTRA IEC INLET)



8 SDI IN & PASS THROUGH (VI5698)



8 SDI IN & PASS THROUGH (VI5698, NOTE THE EXTRA IEC INLET)



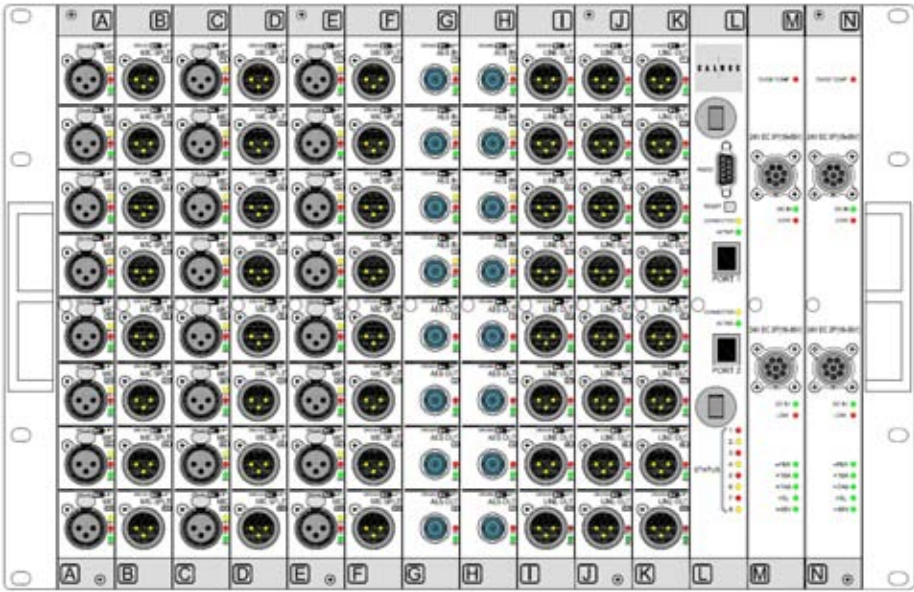
SDI signals can only be patched to the inputs of consoles with Bluefin DSP systems or classic desks running V1.36 or later software.

The 8 way SDI de-embedder is only available on consoles running V2.7 software or later.

DIMENSIONS & WEIGHTS

Unit	Height	Width		Approx Depth (incl. mating cons)		Approx Weight		Input Power Rating	Acoustic Noise (dB-SPL A-Weighted 1M from source)
		Inches	mm	Inches	mm	lbs	kgs		
VI5699(P) 4 SDI in and through (rear connectors, P suffix version provides 2xIEC inlets)	2U	19	483	12	300	11.9	5.4	100-240V AC 0.42-0.23A RMS 50/60Hz	25
VI5698(P) 8 SDI in and through (rear connectors, P-suffix version provides 2xIEC inlets)	2U	19	483	12	300	11.95	5.42	100-240V AC 0.42-0.23A RMS 50/60 Hz	26

MODULAR HYDRA I/O BOXES



Modular Hydra I/O boxes allow a user-configurable set of analog and digital I/O to be connected via the networking system to one or more Calrec digital consoles.

Modular Structure

There are 14 modular slots across the width of the unit, labelled A to N. Input, output, processor and DC PSU modules fit into these slots, in accordance with the requirements of the installation. Input and output modules receive and transmit analog or digital audio signals, to the Gigabit interface processor via a 32 bit TDM bus. The module options are listed in the table below. Each modular unit is 1.2 inches (30.48 mm) wide.

All 14 slots may be used by any of the modules in any combination. However, it is advised that the three slots at the right hand side of the unit are best occupied by a processor control unit and provision for two DC PSU modules, the second of which would be the optional hot-spare, providing power redundancy if the first unit, or the connection to it should develop a fault.

If no spare DC PSU is present, a blank panel can be fitted or the processor unit can move to slot M allowing a twelfth input or output module to be fitted into slot L.

Ground Lift Switches

Input and output modules are available with or without ground lift switches. On modules with switches fitted, the ground is lifted if the switch is toggled to the right.

Module Extraction

A module extraction hole is located on the module front panels to help remove modules for service purposes. The module slides in and out the unit on two runners at the top and bottom of the rack. The rear interface connector on the module then locates into the appropriate connector on the backplane. To aid accurate plugging-up, some guide strips are located between the three interface connectors on the backplane.

External Connections

All external connections are located on the front face of the Hydra I/O box. Space must be allowed in excess of the box dimensions to feed cables to the front interface from any rear access routes.

Mounting

The modular Hydra I/O box is mounted in place using 4 fixing screws on each side angle bracket. Support slides should normally be used to prevent excessive twisting forces on the front fixings.

Fan Operation

To dissipate the heat, 3 low-noise fans are located in the rear of the modular Hydra I/O box. They are controlled from the DC power supply unit. The unit's rear panel has venting holes which must not be obstructed.

Earthing

The box is fitted with an external earth stud on the rear, for connection to an external earthing system. No AC mains power is contained within the rack. All power connections should be unplugged prior to removing the earth connection.

Module Number	Description	Connector Type
AD5090	4 stereo or 8 mono mic/line inputs	XLR
LN5230	8 split outputs for adjacent left mic/line input module	XLR
JB5340	4 AES inputs and 4 AES outputs	BNC
JX5341	4 AES inputs and 4 AES outputs	XLR
DA5091	4 stereo or 8 mono outputs	XLR
UC5339	Processor with copper interface	RJ45
ZN5231	DC Power Supply	8 PIN PLUG

MODULAR HYDRA PSU

RACK-MOUNTED AC PSU

Rack-Mounted AC PSU

A 2U rack-mounted power supply unit is available to provide the DC power for the modular Hydra I/O box. This holds up to four identical AC plug-in PSU modules. One module will provide power for a fully populated modular Hydra I/O box, with a second providing redundancy. Two other modules could be fitted to power a second unit.

The rack has separate AC power inputs and DC outputs for each of the four PSU's. Any one PSU can be removed from the rack without disturbing the operation of the others in the rack.

Diode feeding allows supplies of the same type to be paralleled together.

Mounting Instructions

The power supply rack should be mounted in a horizontal position by means of the side brackets, each of which has two mounting holes. The rear mounting brackets fix to the rear of the equipment bay and should be used when no support is provided under the rack assembly. Extensions of the rack sides slot into these rear supports, allowing the rack to be removed without removing the support. The rack should not be supported by front flanges alone.

Cooling

The rack is fan cooled with fans mounted in the front of each plug-in PSU. The warm air is directed out of the rear of the rack. To ensure proper cooling, there must be a minimum clearance of two inches (50mm) from the fans and rear air outlets, and also any walls or other surfaces.



Input Power Connections

3-wire safety AC outlet sockets should be located near the power system (number as required). Each line cord will provide AC power to one of the power supply modules.

The AC line cord is the mains disconnect for each module. The AC line cords should have an IEC320 connector to plug into the rear of the power system chassis.

Each line cord MUST be suitably rated and FUSED (or have an equivalently rated circuit breaker). The maximum inrush current is 30 Amps. Fuses should be at least 250V AC, T6.3A HRC rated to avoid nuisance "blows". Breakers should be at least 6A , Type C.

Safety grounding is provided via ground connections in the line cord entry receptacles.

If in doubt, please consult Calrec's customer support team.

FAN OPERATION

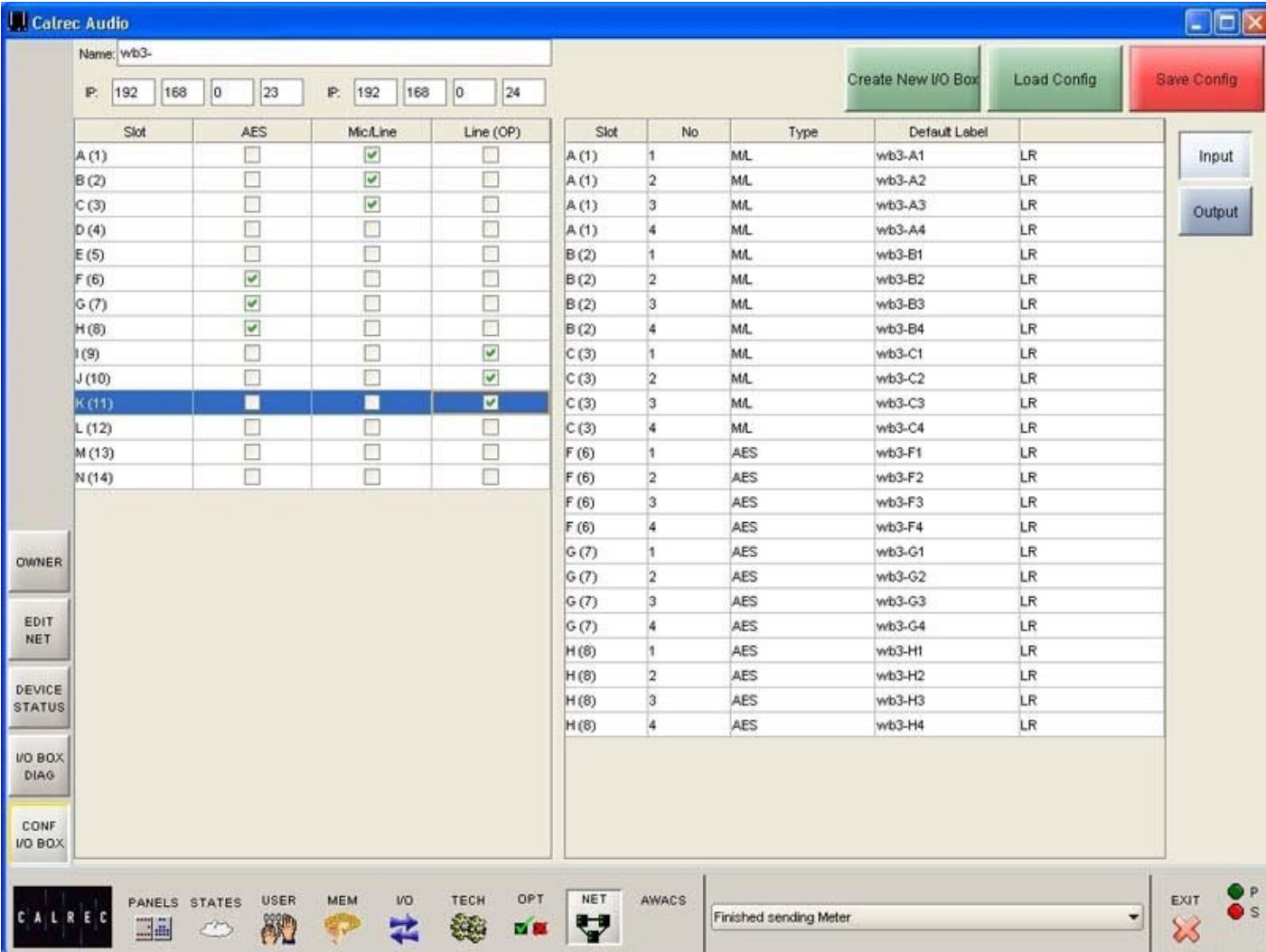
Internal Ambient Temperature	Fan Speed	DC PSU
<50°C (122°F)	OFF	OK
50°C to 55°C (122°F to 131°F)	SLOW	OK
55°C to 60°C (131°F to 140°F)	FAST	OK
60°C to 70°C (140°F to 158°F)	FAST	OVER TEMP
>70°C (158°F)	FAST	DISABLED

Bulk PSU Rack Fan Noise (dB SPL A-Weighted)	
These measurements were taken on axis at 1 metre from the dominant noise source:	
1 x 24V 200W PSU	24dBA
2 x 24V 200W PSU	27dBA
3 x 24V 200W PSU	29dBA
4 x 24V 200W PSU	30dBA

DIMENSIONS & WEIGHTS

Unit	Height	Width		Approx depth (incl. mating cons)		Approx weight	
		inches	mm	inches	mm	lbs	kgs
Modular Hydra I/O Box (Fully Populated)	7U	19	483	12	300	35.2	16
Optional Rack Mounted PSU (with 2 plug-in units)	2U	19	483	12	300	15.6	7.1
Optional Rack Mounted PSU (with 4 plug-in units)	2U	19	483	12	300	25.3	11.5

MODULAR I/O BOX CONFIGURATION



This screen allows the user to manually setup the type of input and output modules occupying each slot in a modular Hydra I/O box.



In some situations, it may be necessary to re-configure modular Hydra I/O boxes to meet the requirements of each program. This can be done offline, and the configurations can be saved and loaded when online again.

The Hydra input and output ports can be grouped into lists to make them easier to access either on the I/O patching screens or on the I/O port assignment controls on the control surface (if available). This is done using the Options - Port Lists screens

This screen allows the network to be configured.



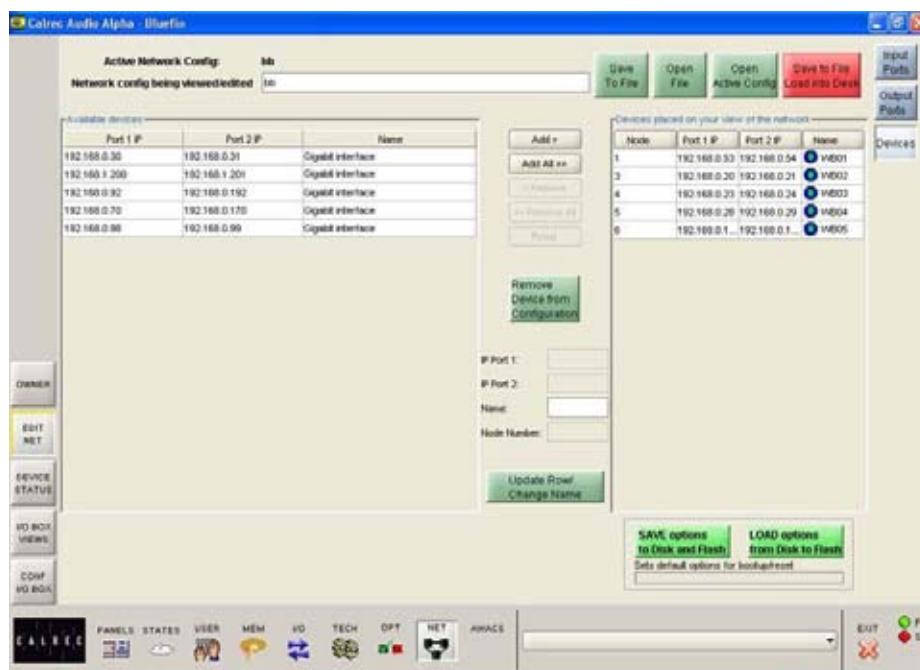
The window on the left side of the screen shows the devices available to the console. These devices will have been loaded via the CONF I/O BOX screen. The window on the right side of the screen shows the devices the user selected for this session.

The Add and Remove buttons are used to add or remove devices to and from the session. The Remove and Remove All buttons are only available when the console is in Technician Mode. Once the required devices are added, the input and output lists may be setup using the EDIT NET - INPUT PORTS screen. Configurations can be saved and restored, to allow use on a job by job basis. This allows multiple setups to be configured offline, and stored for later use.

Saving Network Configurations

Changes to the network configuration will not take effect until "Save to File, Load Into Desk" is selected. Then, the changes become active and the configuration is saved to the hard disk. If any subsequent changes are made, the "Save to File, Load Into Desk" button will flash to indicate that the configuration on the screen does not match the active configuration.

Open File allows a previously saved configuration to be opened. When opened, the configuration will be loaded onto the screen, but will not take effect until "Save to File, Load Into Desk" is selected. The button flashes to indicate that the configuration on the screen is different to the active configuration. The console checks that the configuration is



compatible with the system. If there are discrepancies, an "Error Showing Active Config" message will appear.

"Save to File" saves the configuration to the hard disk without loading it onto the console. "Open Active Config" retrieves the settings that the system is currently using and displays them on the screen, replacing the current configuration being viewed.

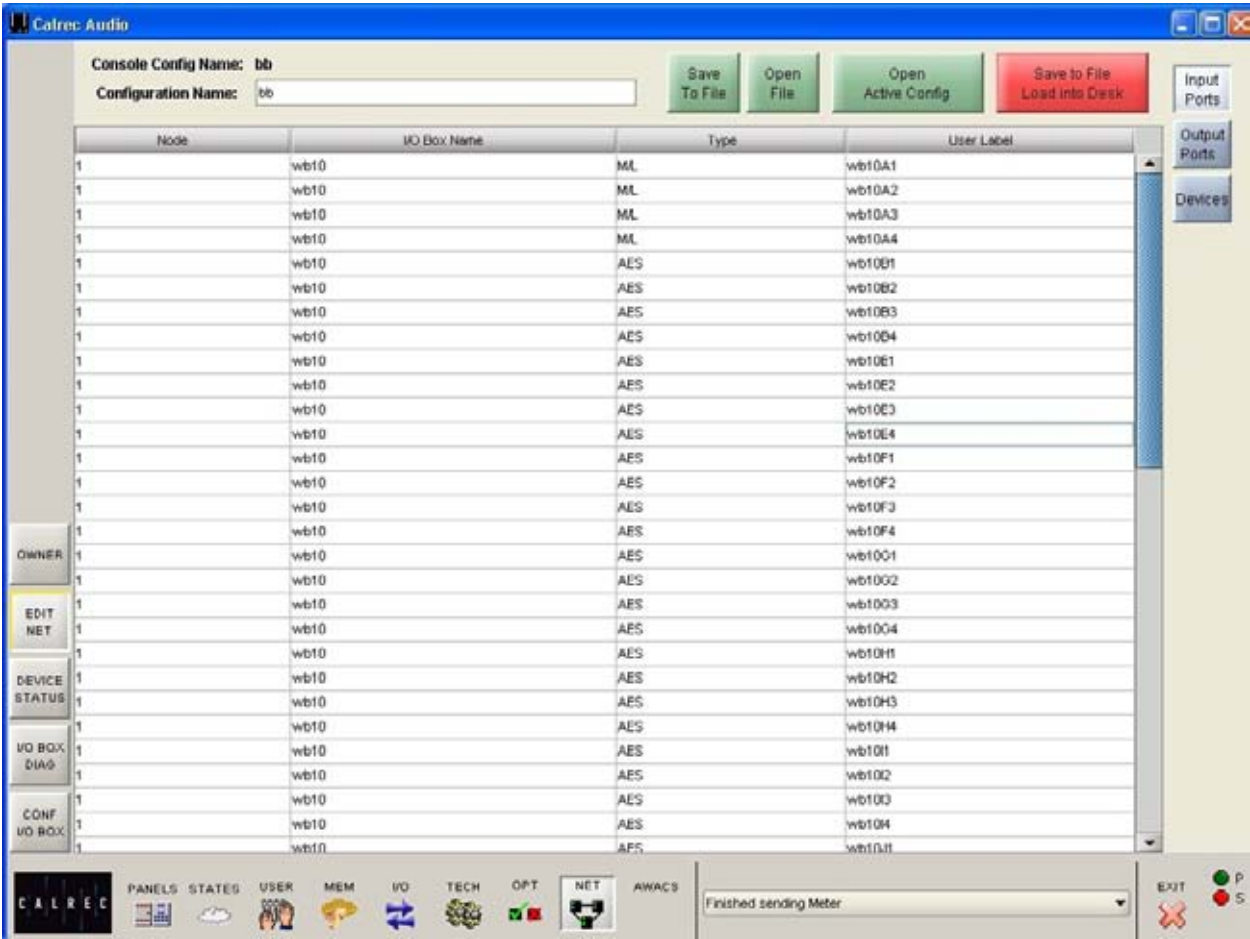
Options

Network configurations are not saved with the user memories, so it is important to save the options to disk and flash once the network is configured using the buttons at the bottom of the screen.

If they are not saved, the next time the desk boots up the console will revert to its previous settings, which could mean that a different network configuration is loaded. 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.

HYDRA I/O SOURCE LISTS



This screen allows the user to view the Hydra sources, their location and type. A similar screen is available to view the output ports.



Hydra ports are always treated as pairs. They can be used for two mono signals, a stereo signal, or as part of a surround signal. Hydra port labels consist of the 4 character unit name (user-defined) plus the module letter (A-N), plus the port number (1-4), plus L or R.

Please note that Hydra inputs cannot be patched to Hydra outputs.

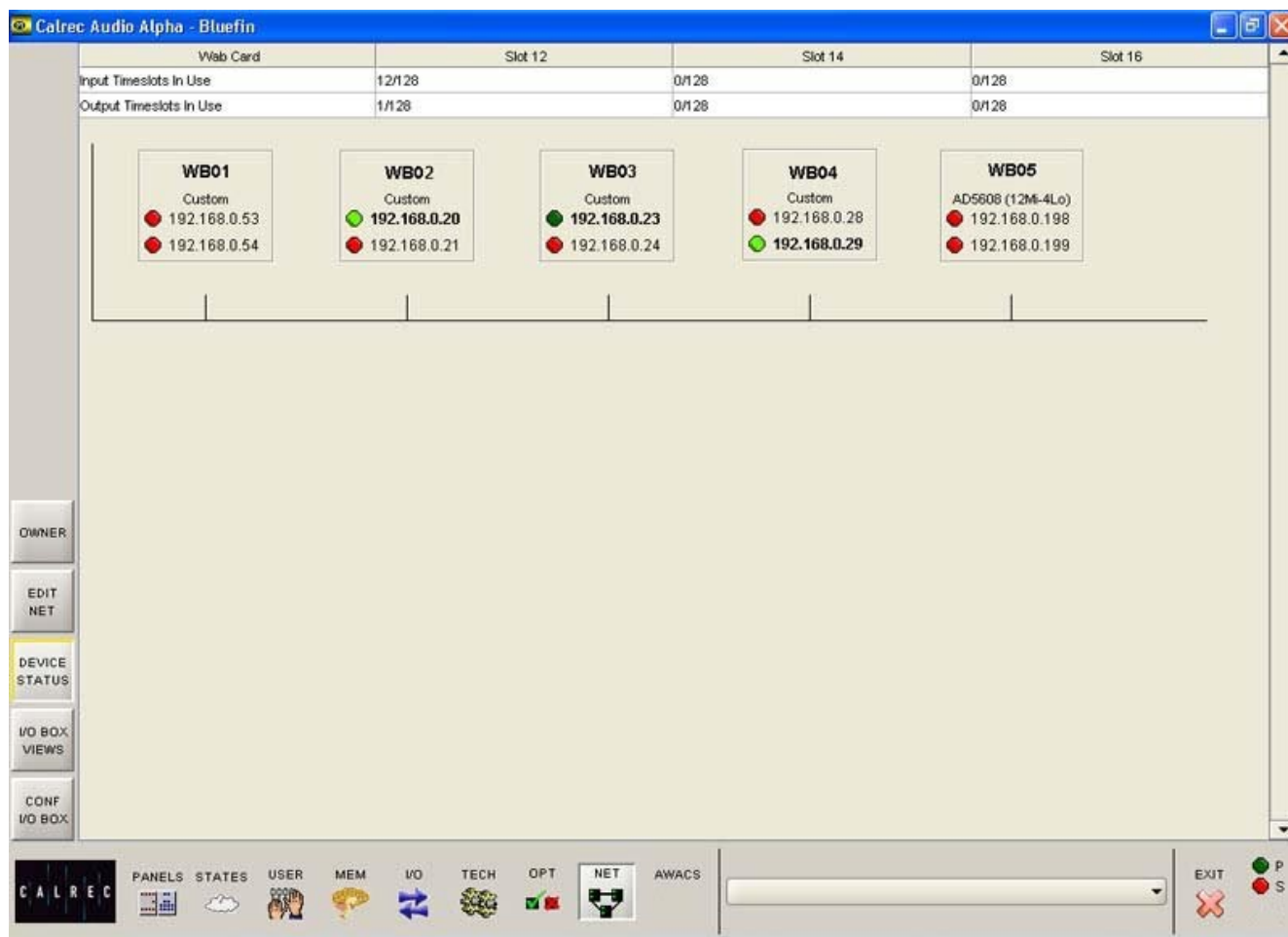
Port Lists

Once the network is configured, Hydra input and output ports can be allocated to lists along with local I/O using the Options - Port Lists screens. These lists are saved as list configurations.

List configurations are linked to network configurations. When a network configuration is saved, it is associated with the current list configuration. When the network configuration is restored at a later date, and the system does not match the expected list configuration, the user will

be prompted to load it, or to re-save the network configuration with the new list configuration.

If a network configuration is edited to remove ports, the list configuration should be re-sent to the console before the changes to the lists will take effect.



The Device Status screen provides an overview of the status of all devices configured on the network.



Each device has a green indicator for its available ports, which will “heartbeat” (flash bright green) to indicate that the unit is running and can be reached. If the device is not “heartbeating” then it cannot be reached.

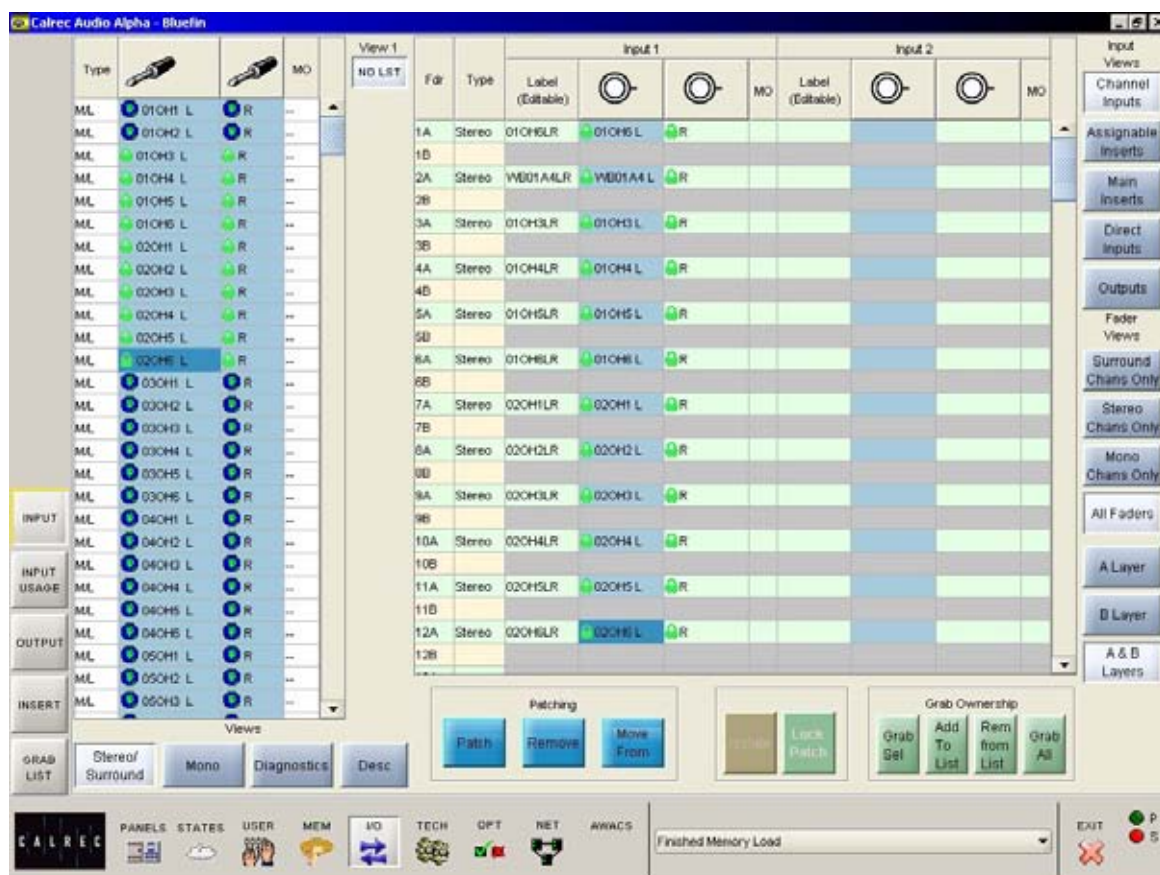
If a device is using both ports (for redundancy), each port will have its own heartbeat indicator. The preferred port will be highlighted. If a port is not

heartbeating, its indicator will light red (But the device could still be in use through the other port).

If neither port is heartbeating, then the device is no longer available.

If the device does not appear to be heartbeating, but it is not greyed out, then the console can access the device, but the PC cannot. This situation could arise in redundant systems, where the PC is connected to just one of two switches, and the connection between the switches has failed. The PC will only be able to “see” the devices connected to the same switch as itself. As the console will be connected to both switches, normal operation can continue.

PATCHING HYDRA SOURCES



Please Note:

- Hydra inputs cannot be patched to Hydra outputs.
- It is not possible to isolate Hydra output ports.

Once set up, Hydra sources are selectable on the I/O screens just like local sources, and can then be patched to faders on the console in the same way. Please note that Hydra inputs cannot be patched to Hydra outputs, and Hydra outputs ports cannot be isolated from memory recall.



Hydra ports can be allocated to lists on the Options - Port Lists screens, just like local ports. Hydra ports are displayed on the left side of the screen alongside local ports, and are patched to console inputs on the right side of the screen. Like local sources, networked sources and their settings are saved with the memories.

Sources have icons to denote their type, they are as follows:



House - A source which is local to the console



World - A Hydra source on a device which is heartbeating



World with a red cross - A Hydra source on a device which is not heartbeating



Green Padlock - The console has ownership of this Hydra source



Grey Padlock - Another console has ownership of this Hydra source



Black Padlock - The source has been added to a grab list.

Patching

Assignment is made by selecting a source, and an input or output, and selecting Patch. The source's name can be edited in the label column. 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.

Surround Signals

It is not recommended that ports on a Modular Hydra I/O box should be combined with ports on a standard Hydra I/O box to create a 5.1 surround signal.

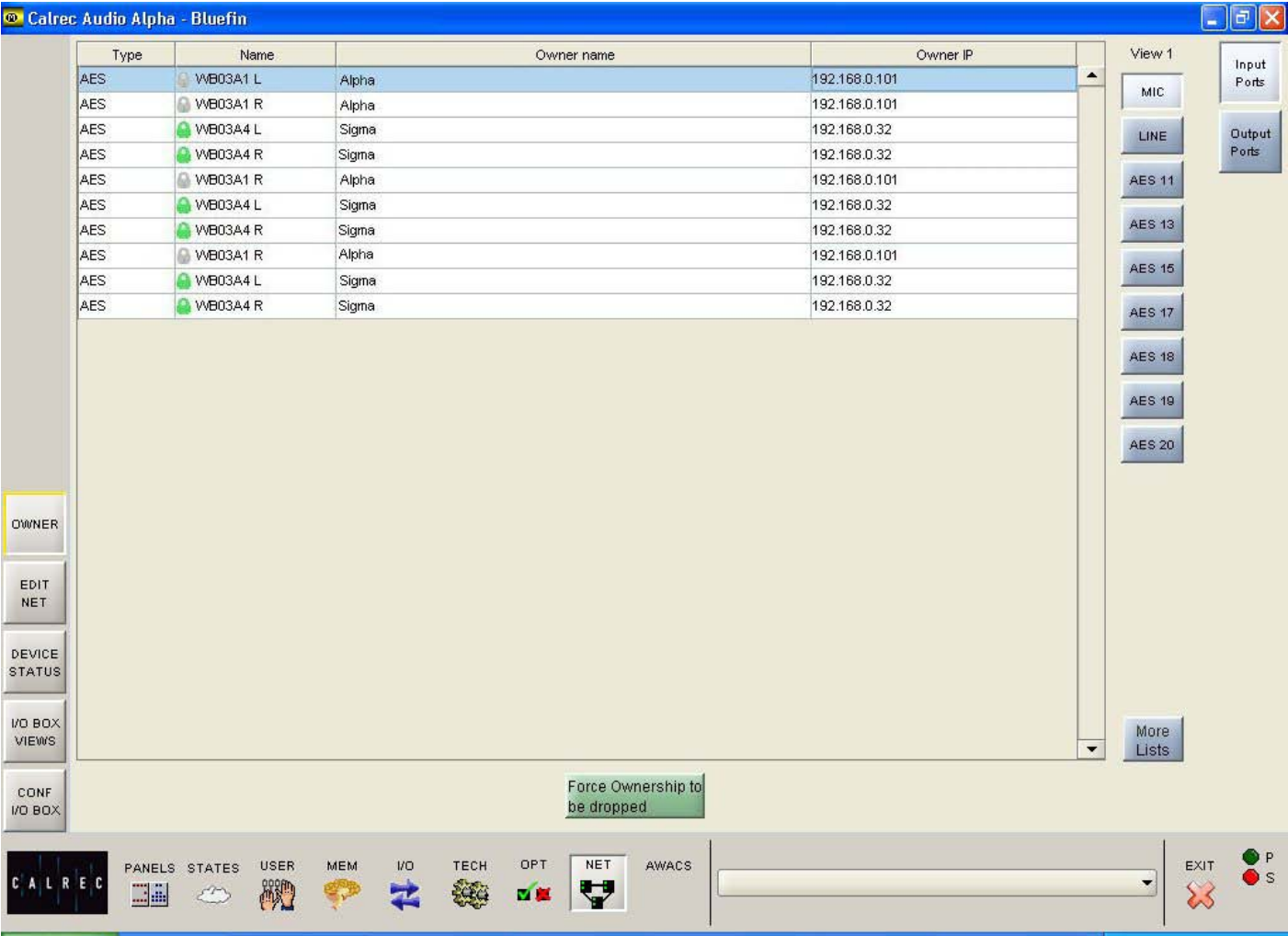
Grab Ownership

When a networked port 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 port first will be given control (ownership) over that source/destination. Other consoles that subsequently connect the same port will not be able to control it.

In circumstances when the ownership needs to be overridden, the grab buttons allow the console to grab ownership of the patched network port, either altogether, individually, or by adding them to a "Grab List". When one or more Hydra ports are added to the grab list, the "Grab All" button changes to "Grab List".

The grab list can be viewed on the Grab List screen, accessed on the left side of the I/O screens.





When a Hydra port is patched, ownership of it is assigned to the console. The console is given control (ownership) over that source. Other consoles that subsequently connect the same source will not be able to control it.



There may be circumstances when a source's ownership needs to be overridden, for example, a microphone is needed for the next show but has not been released from the previous show. "Force Ownership to be Dropped" releases the source from its owner, allowing another console to control it.

This function is necessary for the situation where grabbing the ownership is not sufficient. This could be because the user wants to load a memory using ports it does not own. Upon loading a memory, any gain settings saved for ports the console does not own will be ignored, and the gain settings applied by the owner will be applied. In this case, it would be necessary to force the ownership to be dropped before loading the memory, such that the correct gain settings are recalled.

SDI INPUTS

Each SDI input stream has the capacity to carry 16 mono legs of audio and these are configured as though 8 AES stereo pairs. This makes for a total of 32 AES pairs (64 mono legs).

Whilst the incoming digital audio may often be synchronous with the console reference, sample rate converters are always in the signal path to ensure digital sync is never an issue.

Signals are patched to desk channels in a similar fashion to those from all other types of inputs. The significant difference is that unlike other Hydra input boxes that allow ports to be named in the console software, SDI inputs use a fixed name structure of the form:

1S--B1

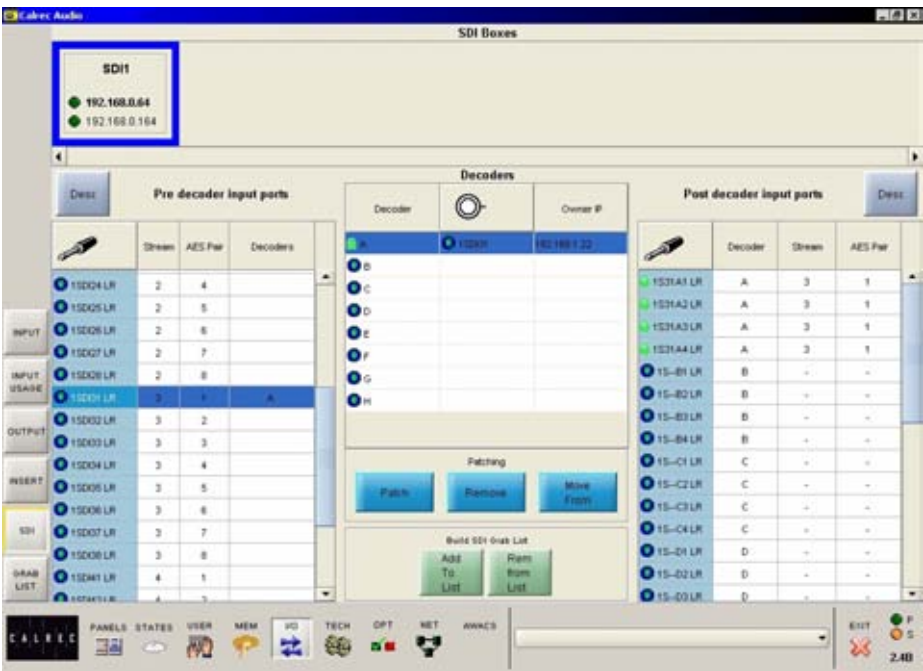
The first digit identifies the box number, and up to 9 SDI boxes can be used on a network. The B following S-- indicates that this signal is coming from SDI input stream 2 (stream 1 being labelled 'A'). The 1 shows that this signal is the first AES pair on that SDI stream.

Optional Dolby Decoders

The VI5672 Hydra box has four SDI inputs and has the option of having up to eight Dolby®E CAT 552 decoders fitted.

If the optional Dolby E decoders are installed, an extra level of patching is required to assign decoders to the AES pairs that have been decoded from the SDI streams.

Select the incoming AES pair carrying the encoded signal, choose an available Dolby E decoder and select PATCH. Dolby E can carry up to 8 legs of audio per AES pair so each Dolby decoder extracts four pairs of signals.



In the example above, Dolby decoder A in SDI box number 1 has received the 1st AES pair from SDI stream 3; the signal referred to as 1SDI31.

At the decoder outputs, this example shows the first of the four decoded signal pairs being known as:

1S31A1

The 'DI' parts of the original name now take on the stream and pair indication. The A shows it is decoder A and the 1, that it is the first decoded signal pair.

These are the pairs that appear as sources in the normal I/O patching system.

It is likely that customers will have defined a usage for streams and pairs within SDI signals and for Dolby E encoded signal pairs within the SDI pairs. A possible input patch scenario is the one shown below

where the surround channel on fader 25A carries signals decoded from three Dolby E pairs and the stereo channel on fader 25B carries an LtRt version of the same signal.

Fdr	Type	Label (Editable)	Input 1	
23B	Stereo			
24A	Stereo			
24B	Stereo			
25A	L/R	sdiDOL	1S31A1 L	R
	CLFE		1S31A2 L	R
	Ls/Rs		1S31A3 L	R
25B	Stereo	LtRt	1S31A4 L	R
26A	Stereo			
26B	Stereo			
27A	Stereo			
27B	Stereo			

SIGMA

APPENDIX A – OFFLINE EDITOR



PART 1 – ON THE CONSOLE PC

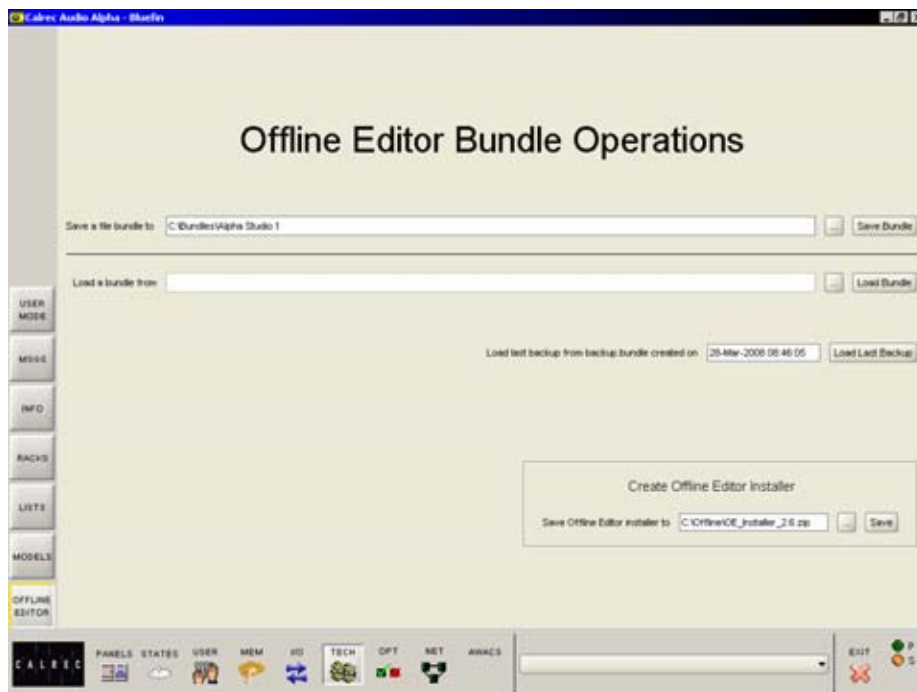
The Offline editor works by providing an emulation of the Calrec console PC application on any other PC such as a laptop. To avoid confusion, this Calrec supplied rack mounted PC will be referred to as ‘the console PC’ and the computer on which the offline application is to be run is referred to as ‘the laptop’, though of course it could be any desktop PC.

The version of the Calrec Offline Editor application to be installed on the laptop must mirror the version of the console software in use. If the laptop is going to be used with non Bluefin desks, it will need the offline application for version 1.36 and if it is also needed to prepare sessions for Bluefin desks, it will also need the offline application for software version 2.6 installing. Desks must be running 1.36 (non-Bluefin DSP) or 2.6 (Bluefin) to work with the offline editor. If later versions are used on a console, additional offline application programs will need to be installed.

When installing a new version of the Offline Editor, be sure to remove any previous versions from your machine

Preparing for offline working

The Calrec main application on the console PC relies on an up to date version of Java being installed. The laptop also needs to have a current Java version installed. If there is none, or if any of the offline editor displays seem incorrect, download the latest version from: www.java.com/en/download/manual.jsp.



Creating the Application

The application program is created from the console PC by going to the Offline Editor page.



The editor installation application can be created anywhere on the console PC, including removable USB or drives, or when the PC port is appropriately linked, it can be a network location.

... In the ‘Create Offline Editor Installer’ section, click the browse button to browse to the required location then press Save.

Bundles

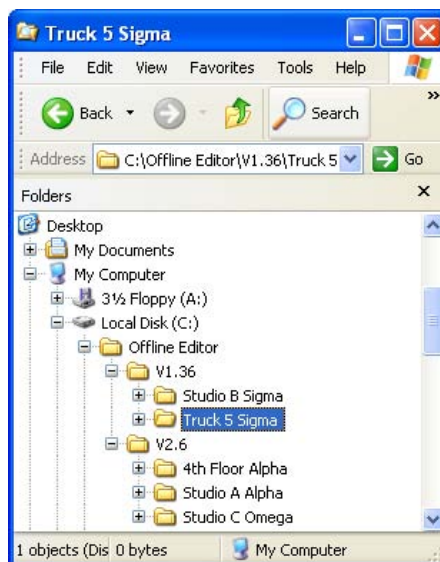
As most Calrec consoles have a unique configuration by way of fader quantity, I/O port numbers, surface panels etc. the Offline Editor has to know all the specific details about the desk which is being emulated and it does this by reference to a file “bundle”.

This same screen allows a location to be specified for the console's file bundle to be created.

PART 2 – ON THE LAPTOP PC

Organising bundles

Once the installer and bundle are created, they can be copied to the laptop. If it is likely the laptop will be used for offline work with several different consoles, it is worth devising a logical 'tree' structure to make it simple to manage the various file bundles that you will soon have for various consoles.



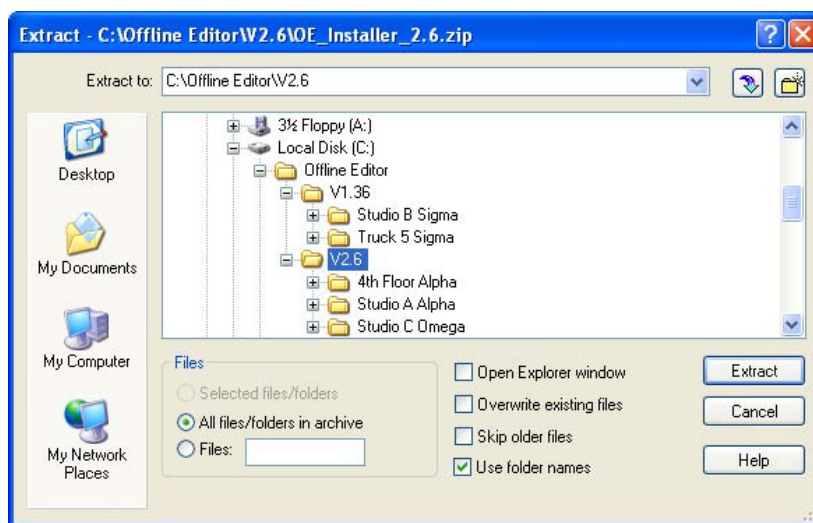
Installing the Application

Unpack the installation program 'OE_Installer_x.y.zip' (x.y being the version number) to the desired installation location using either the Windows unzip utility or any other suitable decompression program.

Be sure that your unzipping utility does not fail to 'Use Folder Names'. In the version shown here this is enabled with a tick in the box.

Once the files have been extracted, locate the file InstallOfflineEditor.exe and double click on it. This will give you the option to create a shortcut to the application in your preferred program group but will default to 'Calrec OfflineEditor'. The application files are installed to the same directory as the installer file.

The offline editor is now installed and ready for use. Depending on the options selected during installation, the application may be run from the new program group or from the icon that has been placed on your Windows desktop.

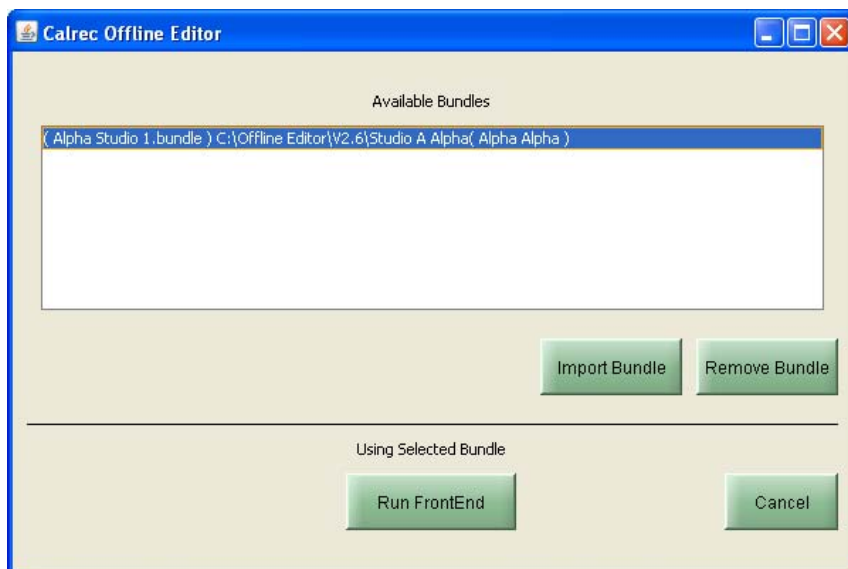


Loading a desk into the laptop

Start the offline editor by double clicking on the desktop shortcut, or by going via the Calrec OfflineEditor program group.

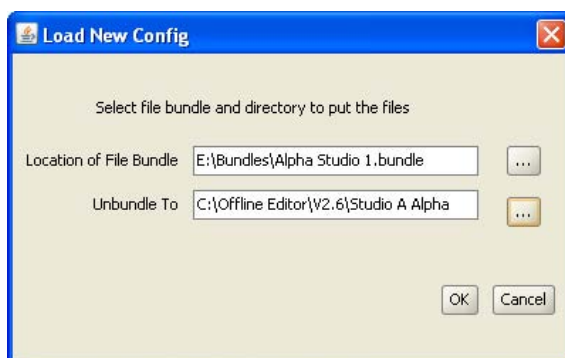
The first time the editor is run, no bundles will be listed. Once you have loaded bundles into the application, subsequent launches will list the available bundles.

Java applications can sometimes decide to check for Java updates and depending on your Windows security / firewall settings, you may sometimes be asked to click an "OK" to give them access through the laptop's firewall.



The Import Bundle button opens a browse dialogue box to locate the required file which, once selected, appears in the list and provides that particular console as an available emulation.

Highlight the required bundle and click 'Run Frontend'. The application checks that the console file bundle being loaded is compatible with that version of offline editor. If you have installed more than one version of offline editor, for example both 1.36 and 2.6, be sure you are running the correct one for the file bundle you need. If you do try to load an incorrect bundle, an error message is given.



Once the 'Run Frontend' button is pressed the laptop screen will show what is normally displayed on the console PC. If the console runs with a network, you may be prompted to load the network ini file. It is then possible to start using the console front end on the laptop screen, making whatever changes are needed. The start point is whatever was live on the console when the file bundle was created.

If you want to start from one of the memories that had previously been saved on the console, go to the MEM screen and the SETUP page to load whichever memory is the correct start point.



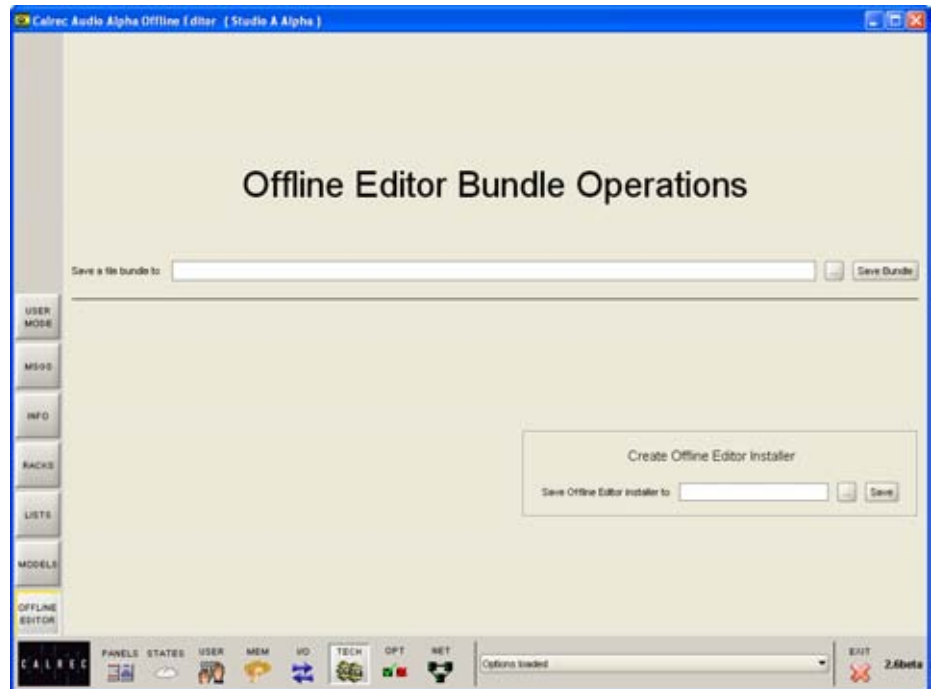
Saving offline changes

When all the setting and configuration changes have been completed they need to be saved into a bundle that can be loaded back into the console.

When working on the console, some items such as meter settings are always saved to console PC files but some choices such as channel/fader setups, port patching etc. normally get saved in the console surface. To get these to the console it is necessary to save them to a memory then backup that memory to the PC. The same process is used with the offline editor.

Once new memories have been saved in the offline editor, go to the MEMORY page and the SETUP screen. Use the BACKUP MEMORIES function to make a new PC file on the laptop. As with online operations, just one, several or all of the memories can be selected for back up. The path to which they will be backed up normally defaults to the one most recently used with operations involving that console.

Once the memory has been saved and backed up, the modified files need to be built into a file bundle, which can be an over-written version of the old one or a new one.



On the laptop screen, go to the TECH screen, OFFLINE EDITOR page. This is similar to the one in the on line version, though without the load bundle option.

This page also allows a new editor installer to be created, though this is only likely to be necessary if the original one has been lost and it is required to setup up offline working on another computer.

Browse for a path for the saved file bundle and click 'Save'. The bundle files are not large, generally less than 1 MB so there are normally choices of method to get that back to the console PC.

Once you are sure the modified files have been built into a new bundle, it is safe to exit the Offline Editor application.

PART 3 – ON THE CONSOLE PC

Loading a modified bundle

On the console PC, go to the TECH screen and the OFFLINE EDITOR page which opens the now familiar ‘bundle operations’ screen.

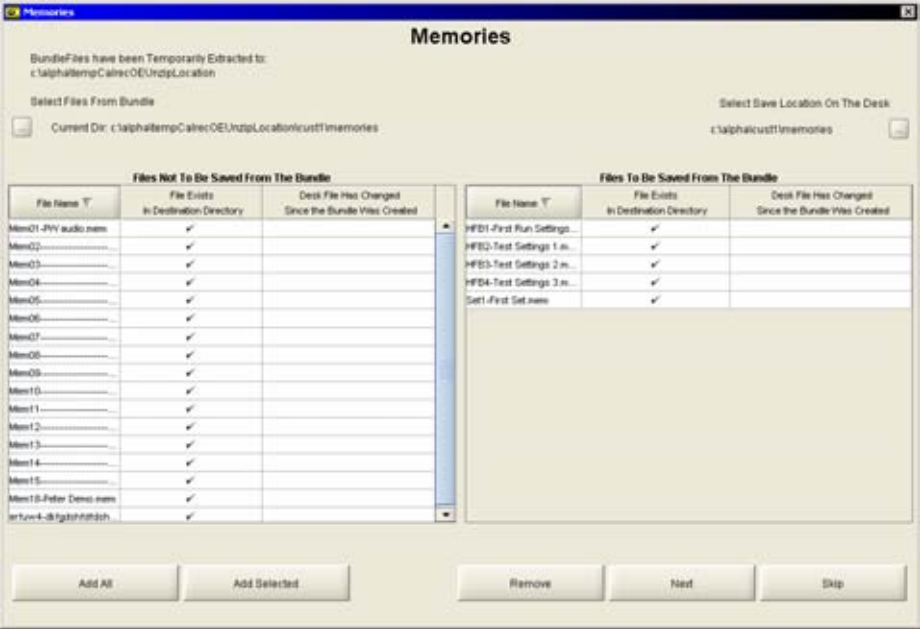
Browse for the modified bundle file using the ‘Load a bundle from’ field.

In many instances, the offline changes may all be stored in console memories but as the offline editor includes the screens that can be used to change meter configurations, router settings etc., there is an option to select which file types should be loaded from the bundle.



It is possible to select all file types by clicking on the tick box at the top of the column but unless there is new information in all the file types, this will add unnecessary steps to the loading process.

As the image above shows ‘Memories’ selected to be loaded into the console, the next screen to appear would be the memory selection screen. Depending on the file types that were specified for loading, the selection and save process may appear different and may also need repeating to load meter, monitor, network or router settings. The operation of these other screens is exactly the same as the memory selection screen.

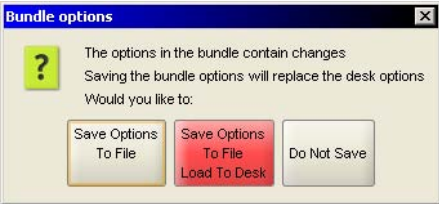


Select memories to load

The application should automatically find the location of the memories in the bundle. If not, the list of available memory files is displayed by clicking on the browse button towards the upper left region of the screen. The destination on the console PC can be confirmed using the browse button in the upper right.

Once the memories are displayed, either ‘Add All’ or ‘Add Selected’ buttons can be used and the selected one are copied to the right pane of the window. ‘Save’ then processes that set of memories.

Repeat this process for any other file types you selected. When you have finished you will be presented with a dialog box confirming that you wish to load the data to the console.



Finishing up

Once the various types of files have been loaded to the console PC, they can be loaded in the same way as other files that had been created and saved to the console PC. For example, going to the OPTIONS page and METERS screen gives you access to Open a saved meter file which can then be loaded into the desk.

Many offline operations are likely to have involved saving a memory file so it will usually be necessary to use the MEMORY page, SETUP screen to get to the RESTORE MEMORIES function.

SIGMA

APPENDIX B – STYLE 1 FADERS

CHANNEL AND GROUP FADERS (STYLE 1)

Channel and group paths are controlled by the console's channel faders. Each fader can control two independent audio signal paths. Any fader can control any channel or group path.

If your console uses Style 2 faders please refer to the description in the Fader Area section of this manual. Style 2 faders have a different button layout, and are slightly different, in the way that the current assignment, interrogated paths and VCA groups are indicated.

A and B Layering

Each fader can control two independent audio signal paths, named A and B. These paths can be either channels or groups. Both signal paths are fully equipped with the same facilities.

Assignable Control

The A and B fader assign buttons are used to select the channel paths. Selecting a path causes the central control panels (Assign panels) to display and control the settings for that fader's channel or group path.

Changes made to the Assign panels will affect the selected path only. When switching between the paths, the displays, LEDs and fader position change to match the settings of each path.

Path Labels

The label in the display is the name associated with the path's assigned input, 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.

If path A is active, the A fader assign button and the label will be lit in green. If path B is active, the B fader assign button and the label will be lit in amber.

Channel or Group Cut/On

The CUT button cuts the channel or group, its effect is the same as fading it out completely. There can be ON buttons

here instead, which switch the channel on.

AFL

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

Indicative LEDs

A set of LEDs next to the assign buttons give more information about the path.

- MR - The fader path is a Master of a VCA style group
- SL - The fader path is a slave within a VCA style group
- ST - The path is a stereo channel or group
- SS - The path is a surround master.
- GP - A group is assigned to the path
- 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. 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.

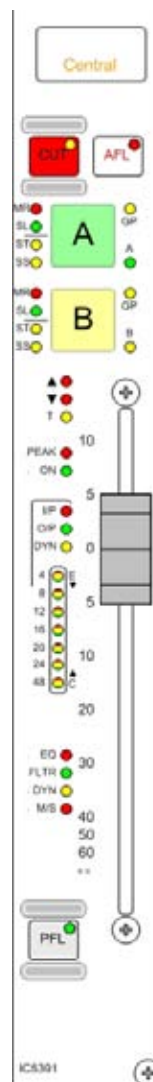
The PEAK LED will illuminate if the channel or group signal is within 3 dB of the clipping level.

The ON LED illuminates when the audio level is not at the ∞ position.

The EQ, FLTR, DYN and M/S LEDs indicate that these functions are switched IN on the selected path (EQ, Filters and Dynamics settings may be flat).

Fader Bargraph

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



PFL

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

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.

Interrogate Mode - Routing Panel

It is possible to discover which fader paths are feeding each of the routing busses by putting the panel into "Interrogate" mode.

INTER

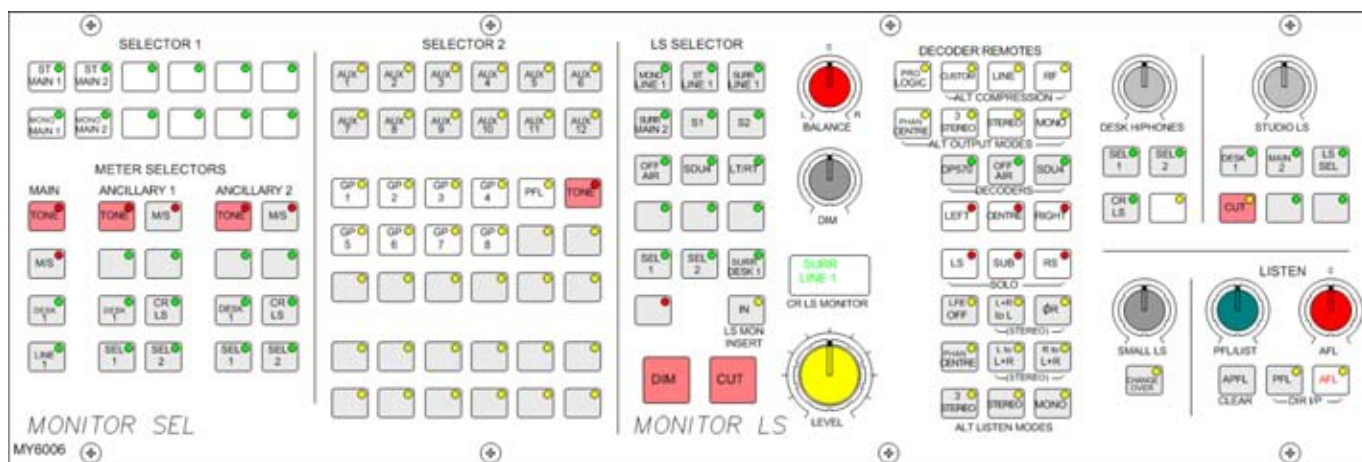
This is done by pressing the INTER button. If any of the routing buttons (groups, mains, tracks) are held down, the fader assign buttons of all the paths feeding that bus will light. This button can also be used to interrogate mix minus feeds using the BUS button on the Input/Output panel.

SIGMA

APPENDIX C – TRADITIONAL STYLE MONITOR PANEL



TRADITIONAL STYLE MONITOR PANEL



Selectors

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.

User-Definable Buttons

The Options-Mon I/P & TB screen is used to allocate monitor sources to the user-definable selection buttons on each 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.

Monitor LS

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 is stereo only.

The LS monitor insert is switched in and out using the button. The LS monitor insert send ports are patched on the I/O - Outputs - Mon TB & Osc Screen. The return ports are patched on the Options - Mon I/P & TB - Mon Sel (EXT I/P) screen.

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 normalization).
- 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.

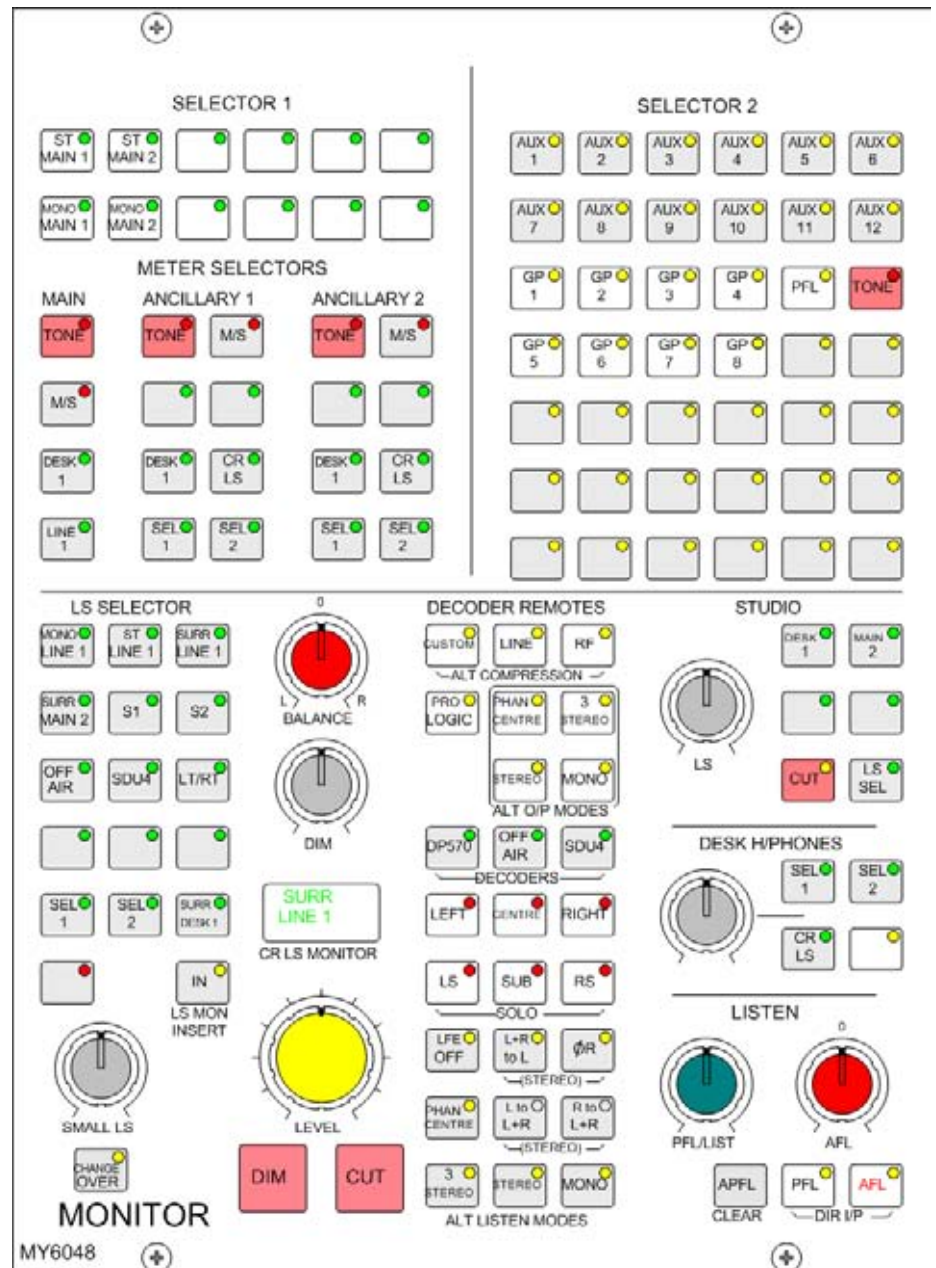
The Ancillary 2 meter can be selected to meter the Control Room LS monitor selection, Main 1 Desk, Sel 1 or 2, or 2 external inputs.

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

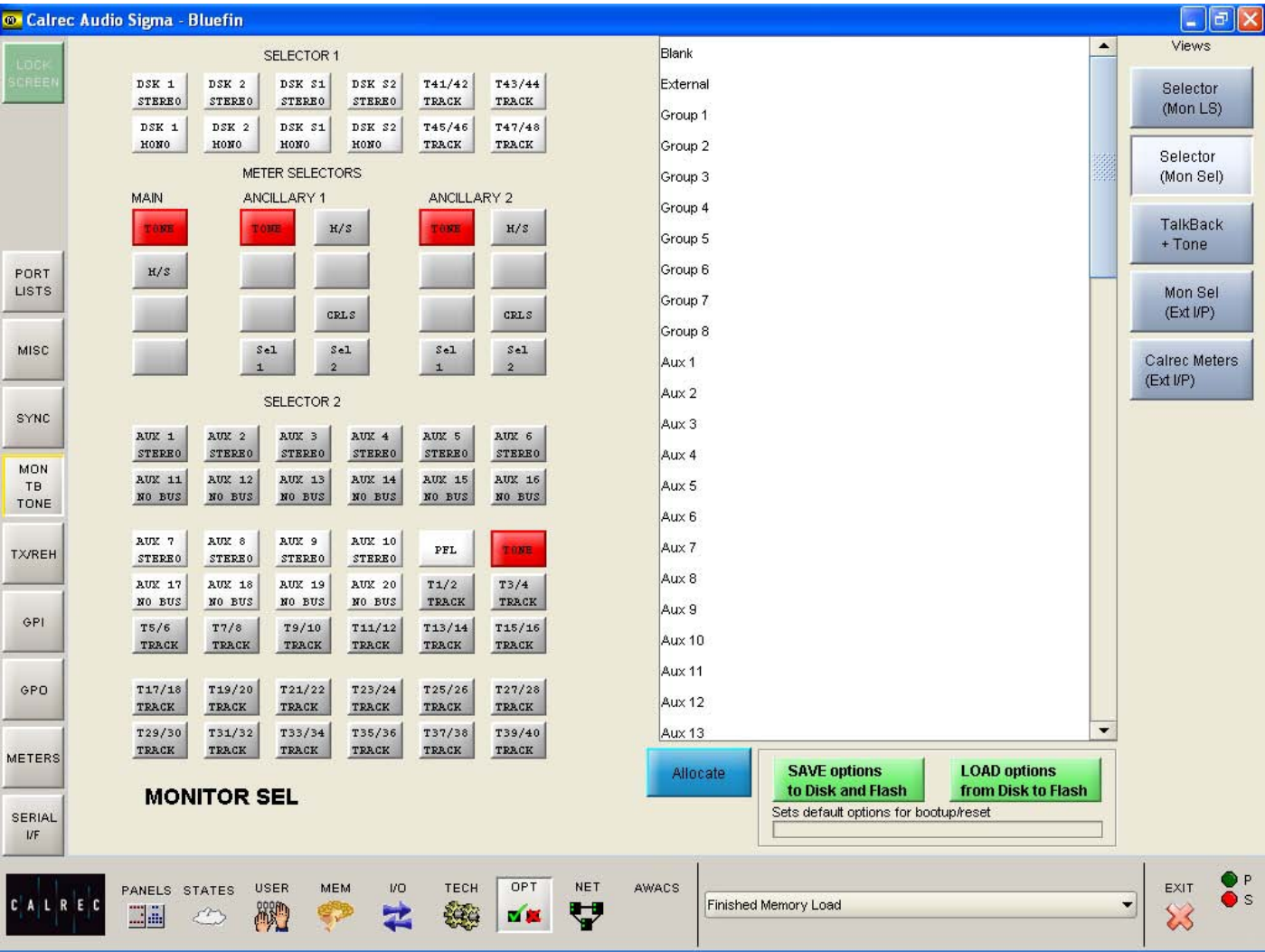
Tone switches allow tone to be sent to each meter.

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.



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 controls. 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 source from the list
- Select "Allocate"

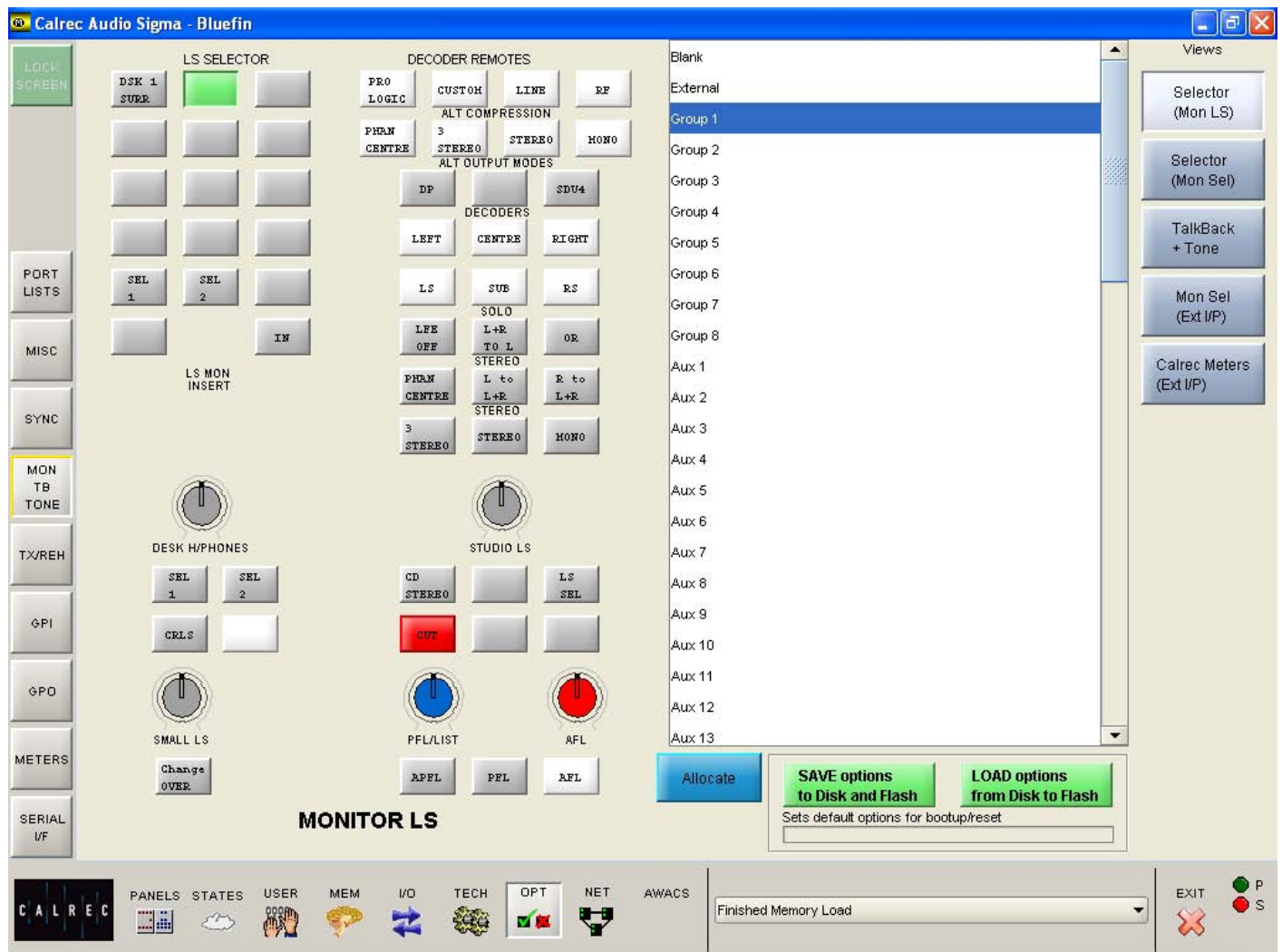


For external sources, a pop up window allows the user to enter a suitable label for the screen button, and to choose whether the source is mono, stereo or surround.

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

If your console uses the 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 LS SET UP



This screen is used to allocate monitor sources to the user-definable buttons on the traditional 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 controls. 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 source from the list
- Select "Allocate"

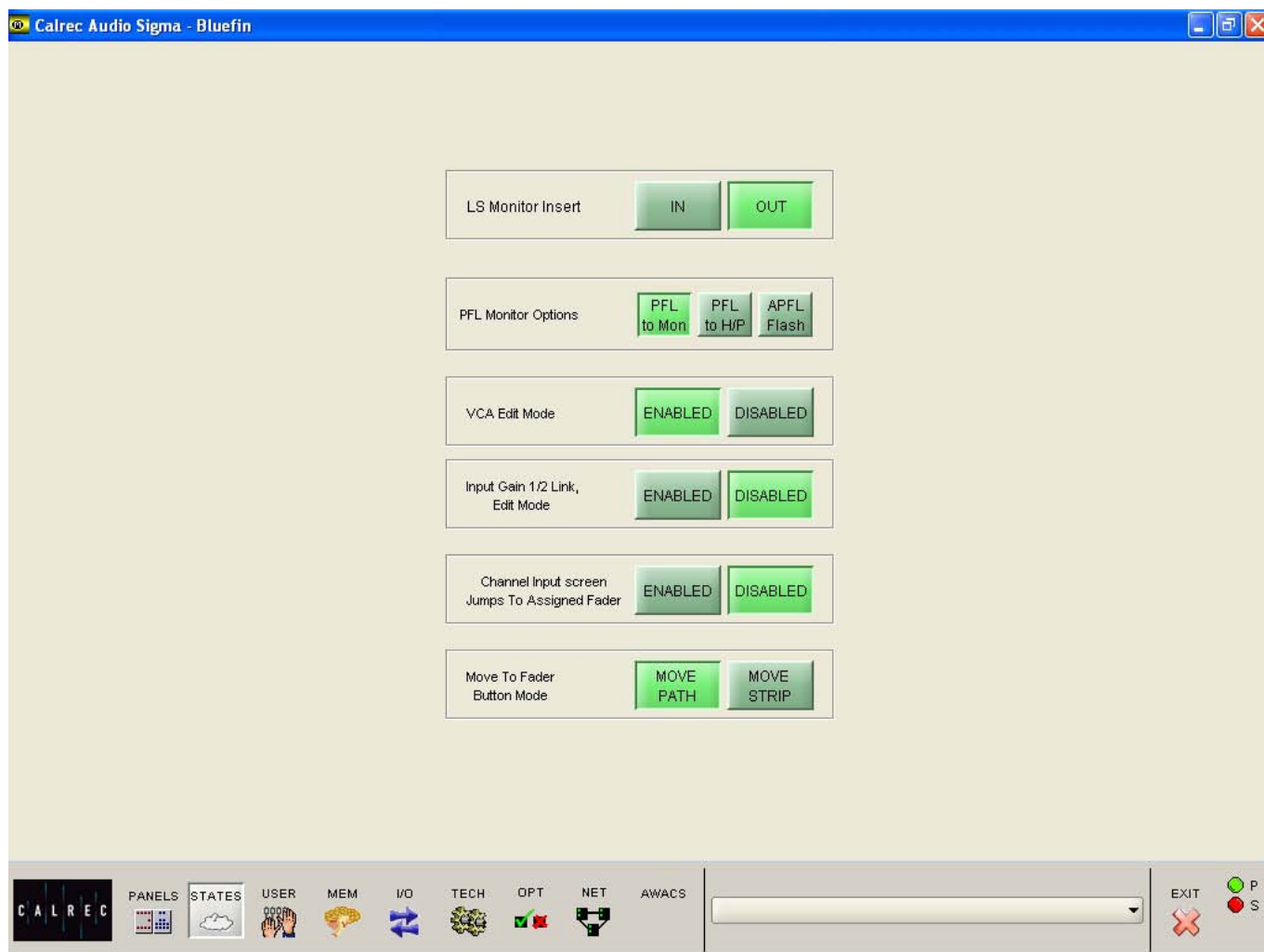


For external sources, a pop up window allows the user to enter a suitable label for the screen button, and to choose whether the source is mono, stereo or surround.

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

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

STATES SCREEN



If your console uses the traditional style monitor panels, there are the following additional controls available on the States screen:



LS Monitor Insert (Only Visible When Traditional Style Monitor Panels are Used)

In addition to the monitor panel button, the LS monitor insert can be switched in and out on this screen. 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.

PFL Monitor Options (Only Visible When Traditional Style Monitor Panels are Used)

PFL TO MON feeds PFL to the Control Room Loudspeaker outputs (post surround panning controls), overriding the LS Selector. PFL to H/P feeds the PFL signal to the headphones. The APFL Flash will enable or disable the flashing of the APFL indicator on the Broadcast Facilities panel.

SIGMA

APPENDIX D – VERSION CHANGES

VERSION CHANGES

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 three 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 synchronization 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 analog 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 panel 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 screen. 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 logo changes.

V1.28 included

5.0 Level Control. Functionality of button and control on Input/Output panel implemented.

EQ and Dynamics control screens, Panels - EQ, and Panels - DYN. This allows the user to adjust EQ and Dynamics from the screen.

Auxiliary Send, Aux Direct Input and Auxiliary Output control screens, allowing the user to control auxiliaries from the screen.

Ability to edit EQ, Dynamics, Aux Send and Aux Output settings of a fader other than the currently selected fader. The "PC Fader" can be chosen by the user for editing on these screens, independently of the current fader selection.

AWACS Error warning can be set to light PSU fail indicator on the Broadcast Facilities Panel. This is done via GPO switching, set up on Options-GPO screen.

V2.1 includes:

320 mono equivalent channels, configured as 108 stereo plus 104 mono channels, with the capability for up to 52 surround channels (constructed from the available resources).

Support for IU5531 spill panel added. New screens on the Frontend at User - Spill to enable routing of surround legs and to mimic the spill panel.

Panel re-arrangement.

Auxiliary busses increased from 12 to 20.

Tracks increased from 24 to 48.

EQ/Filters are now available on groups. There are an extra 2-band EQ and 2-band Filter dedicated to dynamics on each channel and group.

All 8 groups can be mono, stereo or 5.1 surround.

There are 96 pairs of assignable inserts (These are signals available, not ports).

Every channel and group can produce a direct output simultaneously. All surround channels and groups have surround direct

outputs with the option to downmix the output to stereo instead. The mix-minus of a surround direct output is a true mix-minus of the whole surround channel or group.

PFL to Mon and PFL from surround paths to small LS are surround, (PFL LS output is still stereo).

An extra 128 mono legs of buss/output metering (total now 256 mono legs) and the ability to have up to 128 phase meters (instead of 3) using 2 mono legs each.

Channel input delay increases to 256 mono legs of 2.73 seconds. There are 2.73 seconds of delay available on each group. Future releases will allow some of the delay to be assigned to different places. To aid this, 6 new buttons will be available with which to tell the console where to switch the delay in.

Power consumption and the amount of heat generated are reduced, and because far fewer components are used, reliability is enhanced as there is less to fail.

There are 64 External meter inputs. External meters on TFT meters can now be surround. External meters on TFTs can now be labelled. It is now possible to route networked sources to external meters.

One opto can now be assigned to up to 10 functions. GPI can be locked once set up to prevent accidental removal.

I/O - Input - Channel Input screen scroll with fader assign button presses is now an option which is enabled/disabled on the States screen.

I/O - Input screen - Input source lists can be sorted using column header when viewing as diagnostics (Rack/Slot/Input).

Edit Net - Config I/O Box screen - A warning now appears when the network config has been changed.

Panels - Delay screen - Can now adjust delay values for the "PC fader" - a different fader selected than the currently assigned fader. The Interrogate button on the screen will not be functional when a PC fader is being controlled.

Panels - Route screen - Can now control routing for the "PC fader" - a different fader selected than the currently assigned fader.

User - Chan screen - There is a new button on this screen for assigning delay to a Wild control. This is so that delay can be assigned to a Wild Control without using the delay panel.

Temp All A/B. To view All A or All B momentarily, so that console displays revert back to previous A/B pattern afterwards.

Shaft Default Press - to allow the shaft press of a rotary control to set the value of the control to a default. This behaviour will be enabled/disabled via the front end.

Patch Dependent Input - The selection of either input 1 or input 2 will only be allowed from the channel control panel if the input being selected has a port attached. The ability to select either input 1 or 2 regardless of port attachment is still available from the Input Output panel.

Side Chain Listen

Dynamics - Soft Knee and Recovery Hold

Move Fader Strip.

Local inputs to Hydra outputs - Correct Gain.

Memories can now be restored to a different location number (Mem-Setup screen).

Memory filenames include long and short descriptions.

Modifications to block patching so that it works for 2 columns at once.

Direct Output now defaults to unity gain.

Screen Maximise correction (for when windows taskbar is not hidden & Windows XP display fixes).

PC Backup facility.

V2.2 included:

Delay Work - allowing delay on group inputs, direct outputs, insert send/return for channels and groups and insert return for mains.

Reset faulty DSP after hot swap (Self Healing DSP).

A change to the way I/O port lists work: Local I/O and Hydra I/O can occupy the same list.

- More than 64 Hydra ports in one port list
- Sets of ports (for surround perhaps) are kept in sequence when port lists are sorted alphabetically.
- Description field for each port, viewable on front end.
- Port lists can be saved as user files.
- Mic open buss allocation moved to Options screens (for local and Hydra ports).

Inputs Usage screen to show all input connections.

Enable Autofader mode - The user can enable / disable the auto faders when they are attached and are being controlled by the optos, without having to unpatch either the auto fader or the opto. The spare button on the Input/Output panel, next to the Insert In/Out button is used to toggle between the new 'Enable Auto Fader' mode and the current Insert In/Out mode. When in this new mode the 'Insert In/Out' button will enable or disable the currently attached auto fader.

Clear multiple channels - The ability to clear many channels at the same time. This is implemented on the User-Chan screen

Buttons on the Options - Misc screen set the functionality of the All A and All B buttons on the assignable fader when using a short press. If set to change layer, a short press on the ALL A and ALL B buttons will switch all the channel faders to display either their A path or their B path permanently. If set to "Latch View", a short press of an All A or All B button will display the paths on the control surface until the button is pressed again. This is so that the console's A/B display pattern is not lost. The console will revert back to the previously displayed layer on each fader.

Panels - Input/Output screen. A screen representing the Input/Output panel controls.

Panels - Route screen now includes track send controls. Interrogation will not be permitted from the screen.

Cue Director can now associate Hydra input ports with external router inputs and Hydra output ports with external router outputs. It is still not possible to route Hydra inputs to Hydra outputs.

Links to Operator Manual pdf in Calrec group from Windows Start menu.

V2.3 Included:

Panels - Routing Matrix screen - Similar to Spill-Routes screen, but includes all channels, mains and auxes in addition. Spill Routes screen will no longer exist.

For Surround CRLS and Meters 1-4 (Main 1 and Anc 1 on traditional style monitor panels), TFT Meter width is now dependent upon the source selected. The TFT Meter will automatically change to match the source.

Panels - Track Output screen.

Replay button and setup screen. Channels selected by the replay screen will flip to input 2 when the replay button and EXEC is pressed. Memories will store replay selections.

Divergence/Convergence on stereo channels and groups. Also, divergence changes such that the overall volume isn't increased when it is applied.

EQ on main outputs including HF filter to go down to 50Hz (for use as LFE filter).

Expander on main outputs.

Spill out Surround Mains - so that the spill panel can be used to control each leg of the surround main.

Spill panel to be used to control downmix levels from surround channels and groups to stereo busses. Spare button on the spill panel will be used to select the mode of the panel. Also controls Main output stereo downmix on surround Mains.

Thicker Peak spot/Phase marker on TFT meters.

Longer time constant on peak spot on TFT meters.

Delay on Main insert sends.

Optional LB and RB (Left to Both, Right to Both) switching from the fader strip, instead of DIR TB and ALT WILD.

V2.6 included:

Support for Ross Video Overdrive/Synergy system via a serial interface.

V2.6B included:

Offline Editor functionality.

V2.6F included:

Default compressor attack time changed from 5ms to 30ms.

V2.8 includes:

Up to 33 SDI boxes on a network.

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