Alpha 100

TECHNICAL SALES DATA
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CONTENTS

OVERVIEW

FRAME OPTIONS & DIMENSIONS

FADER AREA

ASSIGN PANELS

SCREEN OPERATION

TECHNICAL INFORMATION

Overview

INTRODUCTION

The Alpha 100 is a large format digital console designed for the most critical broadcast production and on-air applications. It is a no-compromise design that provides comprehensive features and functionality with sophisticated failure protection systems. The Alpha 100 represents a milestone in digital audio mixing console systems as it offers the reliability associated with analogue technology but with the flexibility of an all-digital system.

The Alpha 100 is the result of over 30 years experience in broadcast console design and is the third generation of Calrec consoles to feature a digital control surface and computer-aided memory system. The introduction of digitally controlled assignable systems in 1980 has allowed for their ergonomics to be continuously refined by user input and the Alpha 100 reflects this in its user interface. In contrast to many other designs, the flexibility offered by digital control has been harnessed to provide greater functionality and ease of use.

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

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

ISO 9001 AND RAB REGISTERED

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

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

PRINCIPAL FEATURES

- **Format**
  Up to 96 faders, with A & B layers of control, plus 4 dedicated Main Output faders.
  Up to 96 Stereo or Mono Channels plus 34 Mono Channels.
  Comprehensive Surround Panning and Monitoring with optional Motorised Joystick.
  Input Delay and Control Panel Option
  Optional I/O Expansion via a wide area interface such as MADI.

- **Channel / Group Facilities**
  All channels have 4-band EQ, 2-band Filters, Compressor/Limiter and Expander/Gate.
  Up to 20 Auxiliary Outputs which can be 20 Mono or 10 Stereo.
  All groups have Compressor and Expander/Gate.
  There is a pool of assignable Inserts and a pool of Direct outputs for channels and groups.
  Direct Outputs can be from Pre EQ, Pre Fader, or Post Fader.
  Every Direct Output can be a Mix Minus feed.
  All faders are Motorised - a centrally assigned fader is also motorised.

- **Routing**
  8 Stereo or Mono Audio Groups.
  Additional VCA style Grouping system.
  Up to 48 outputs for multi-track or general purpose feeds.
  Tracks can be fed from Pre EQ, Pre Fader, Post Fader or Mix Minus.
  4 Main Stereo or 5.1 Surround Outputs with Compressors.
  Simultaneous LCRS, Stereo and Mono outputs available from each 5.1 Main output.
  Every channel can route to every bus, at the same time, without restrictions.
  Direct Input available to Group, Mains, Auxs and Mix-Minus busses.

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

LAYERING

Each Fader can control two independent audio signal paths, named A and B. These signal paths can be either Channels, Groups or Main Outputs. B signal paths are fully equipped with all the same facilities as an A path.

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

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

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

Optionally, seperate faders for A and B paths can be provided in the same frame width (these would share a single “Channel Control” module.

ASSIGNABLE CONTROL

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

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

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

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

For large consoles, or consoles which are to be used by two operators at once, there can be two sets of Assign Panels. In the case of two operators, the faders will be split into two “Assign Sections”, one for each set of Assign Panels. The second set of Assign Panels may contain fewer modules. For example, there may be only one Functions or Input/Output Matrix module.

PATHS AND PORTS

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

In a digital desk, there are three basic types of input: Mic, Analogue Line, and Digital. However, all three types of input are not provided for every channel. This is because, since only one type will be used at once, to provide all three for each channel would increase the cost, size and power consumption of the desk unnecessarily.

Instead, a "pool" of each type is provided, plus an internal matrix to allow any of them to be connected to any channel. This provides more flexibility than is possible with analogue designs. The matrix can be thought of as an electronic patch-bay with the advantage that any connections made will be stored with the console's memories.

Each channel can select from two inputs (1 & 2), switched on the Input Output panel. These can be any combination of Mic, Line, AES and MADI. Both inputs can be set up independently using the input matrix. The two inputs have separate input controls which include input gain, phase reverse and phantom power, etc. The switching between the two inputs takes place after these controls. A similar matrix and "pool" is provided for the outputs which can also be stored with the memories.

The basic terminology is that Channels, Groups and Mains, etc 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.

INPUTS AND OUTPUTS

The number of inputs and outputs provided is tailored to the particular requirements odf the installation. For example, not every customer will require direct inputs to the mix busses. Input and Output cards will only be fitted for the signals which the customer wishes to use. Sharing of resources can also reduce the quantity of cards needed.

There are two types of ANALOGUE INPUT CARD:

- Analogue Mic/Line input with 16 Mono (8 Stereo) inputs per card.
- Analogue Line input with 16 Mono (8 Stereo) inputs per card. These are used for Analogue Tape Machines, Insert Returns, Direct Inputs etc).

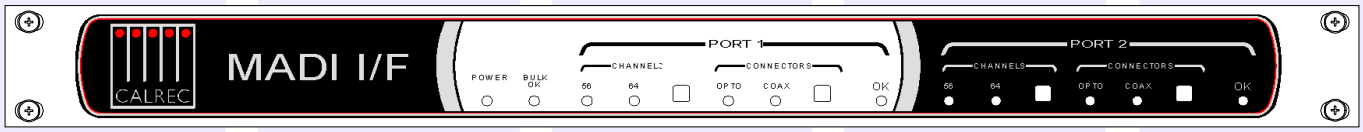
There is one type of ANALOGUE OUTPUT CARD:

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

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

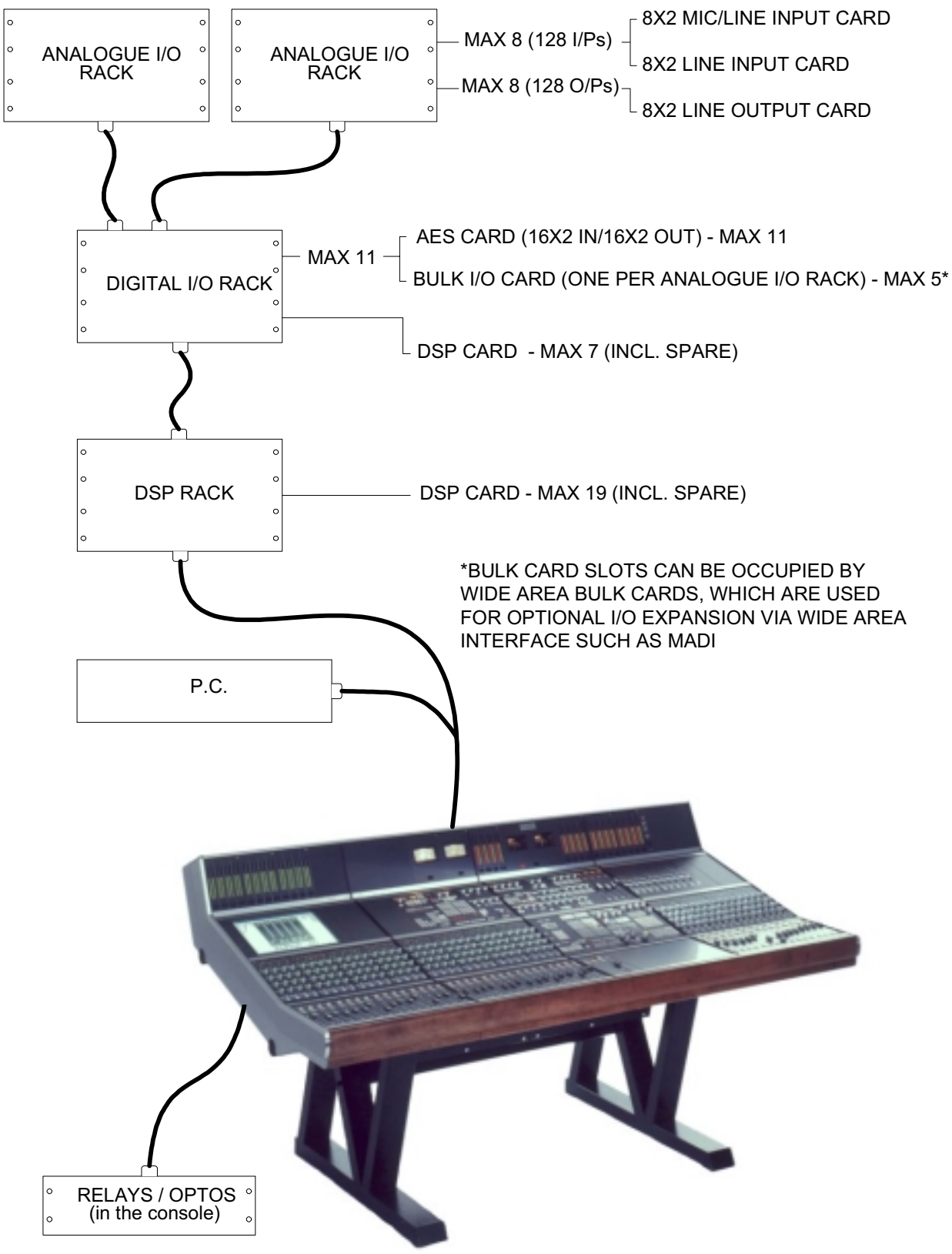
- Digital (AES3) input/output card with 16 Stereo inputs and 16 Stereo outputs per card. All the inputs have switchable sample rate conversion.

MADI (Optional)



The rack mounted MADI Interface unit contains two independent, AES10 MADI compatible interfaces, and is available as an option. The two ports are interfaced to the Alpha system via a Wide Area Bulk (WAB) card, which occupies one of the bulk card slots in the Digital I/O Rack.

Each MADI interface can operate in either 56 or 64 channel mode at a nominal frame rate of 48kHz. The frame rate can be derived internally and passed to the console, or received from the WAB. Each MADI interface can transmit over a coaxial AND optical medium and receive over a coaxial OR optical medium. A switch allows receiver selection.


ANALOGUE I/O RACK
ANALOGUE I/O RACK
MAX 8 (128 I/Ps)
8X2 MIC/LINE INPUT CARD
8X2 LINE INPUT CARD
MAX 8 (128 O/Ps)
8X2 LINE OUTPUT CARD
DIGITAL I/O RACK
MAX 11
AES CARD (16X2 IN/16X2 OUT) - MAX 11
BULK I/O CARD (ONE PER ANALOGUE I/O RACK) - MAX 5*
DSP CARD - MAX 7 (INCL. SPARE)
DSP RACK
DSP CARD - MAX 19 (INCL. SPARE)
*BULK CARD SLOTS CAN BE OCCUPIED BY WIDE AREA BULK CARDS, WHICH ARE USED FOR OPTIONAL I/O EXPANSION VIA WIDE AREA INTERFACE SUCH AS MADI
P.C.
RELAYS / OPTOS (in the console)

(920-542)

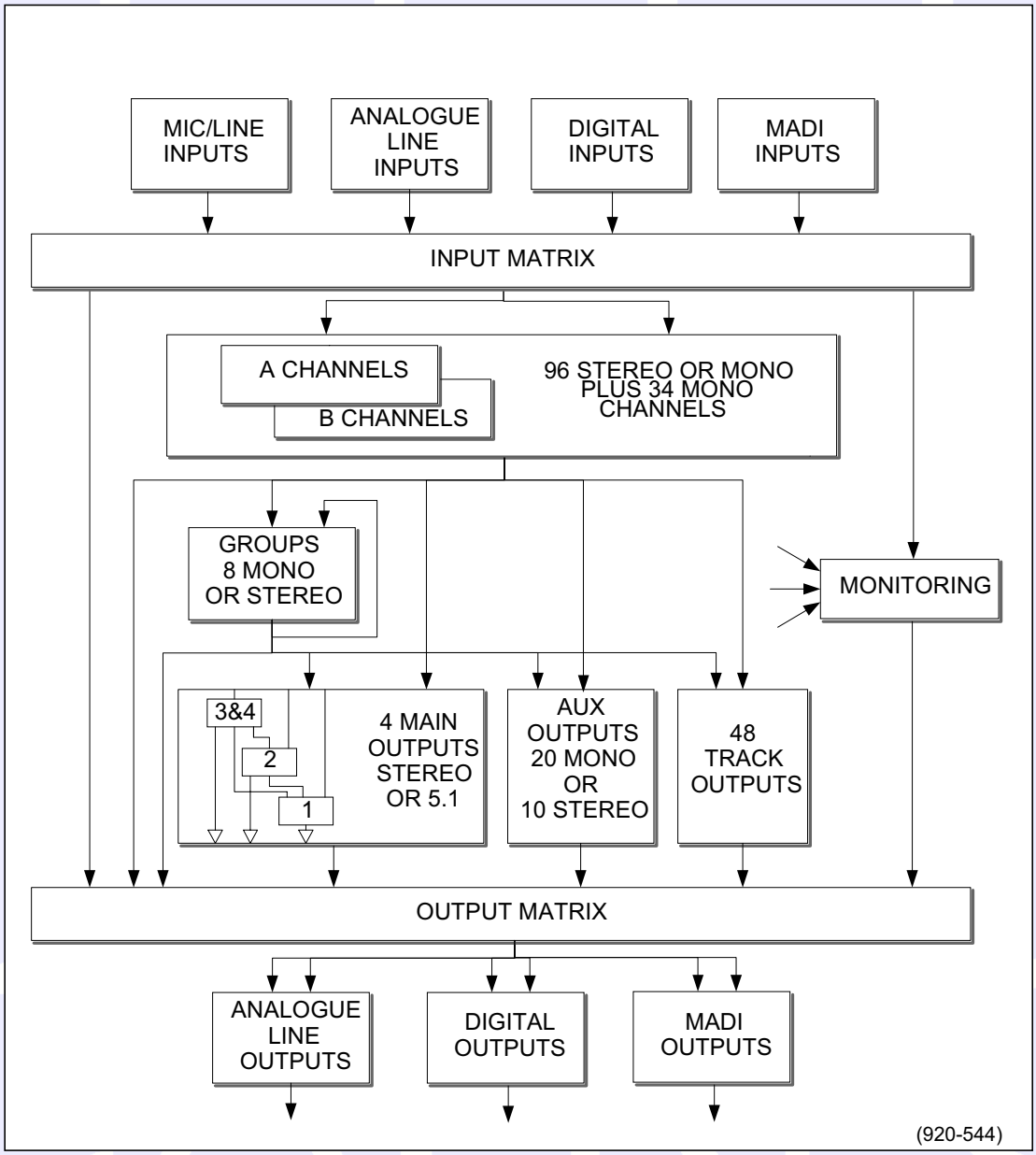
SIGNAL PATHS

As can be seen from the diagram, the Alpha 100 can have up to 96 Stereo or Mono, plus 34 Mono channels.

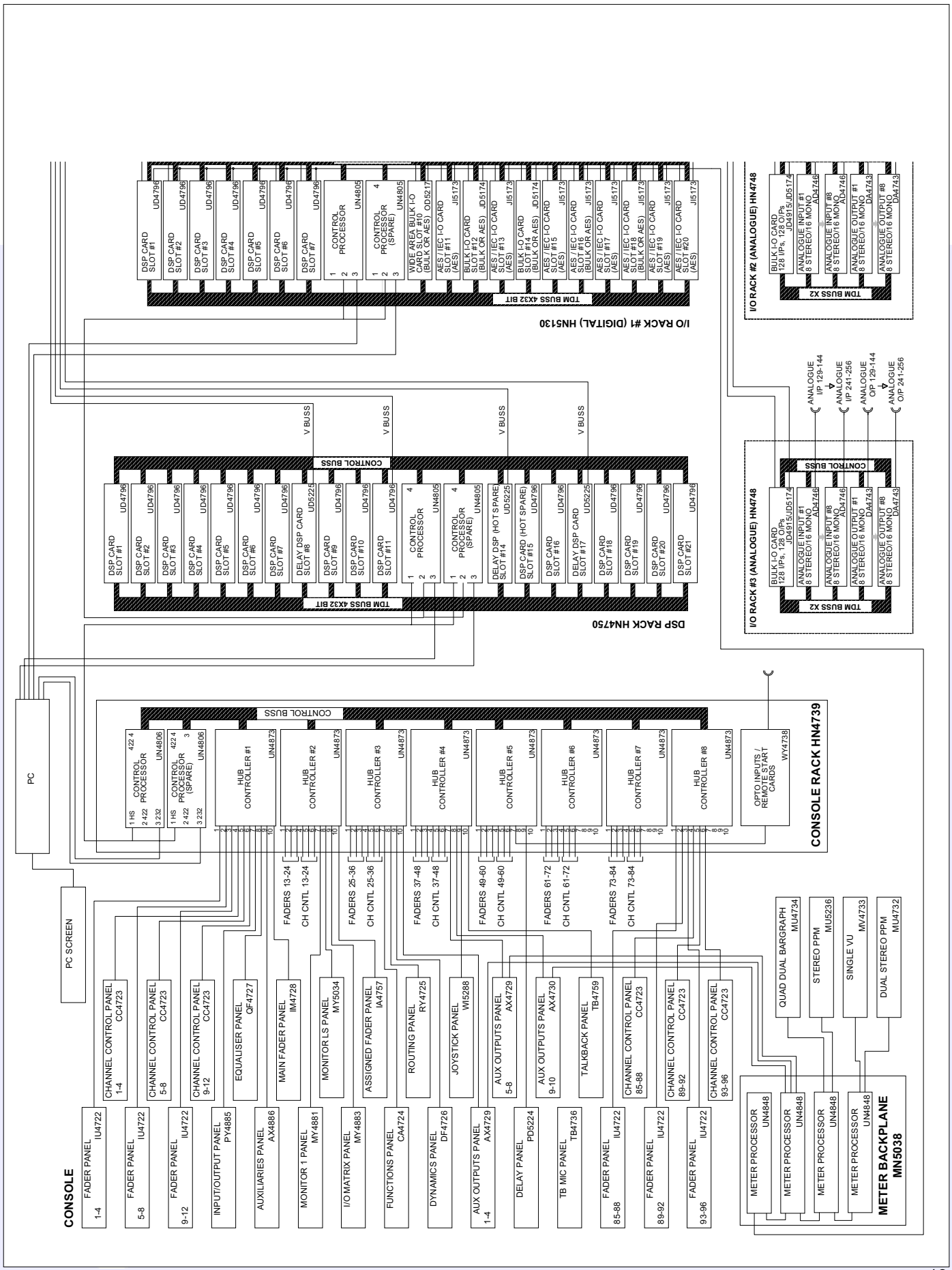
The 8 groups can each be designated as stereo or mono using the Busses screen in the User screens group. In addition, as many VCA style groups as required, can be created.

The 4 main outputs can each be designated as Stereo or 5.1 Surround. If they are 5.1 Surround, a mono rear is derived at the output to allow them to be used as LCRS mains. 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 two 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.



TYPICAL DIGITAL SYSTEM DIAGRAM



Frame Options & Dimensions

FRAMES AVAILABLE

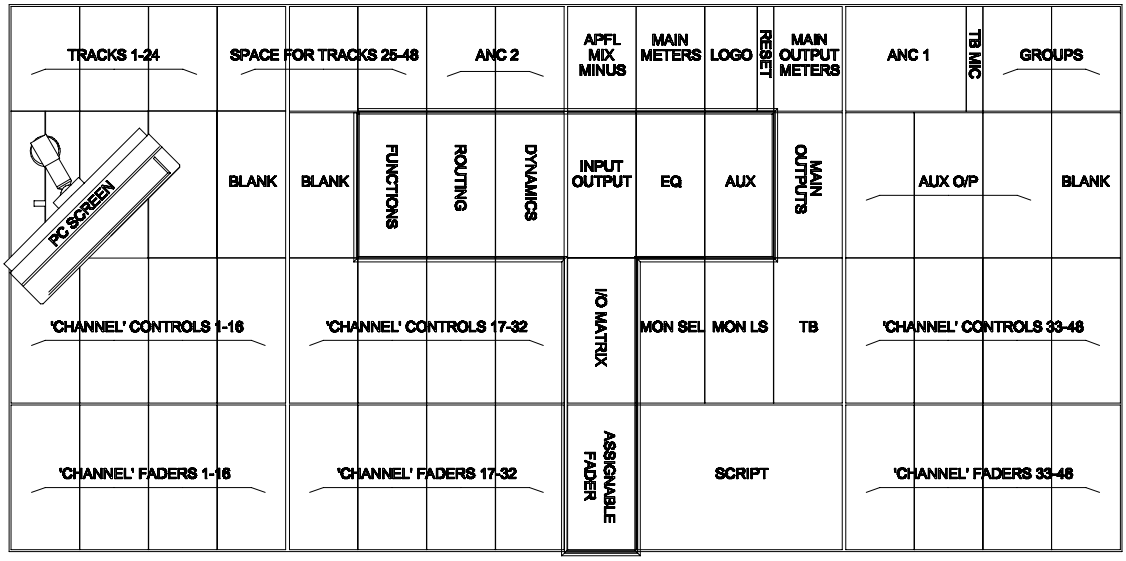
The smallest frame size is 48 faders, which with 2 audio paths on each fader, allows up to 96 “Channel Faders” within a frame only 2054mm (80.9 inches) wide.

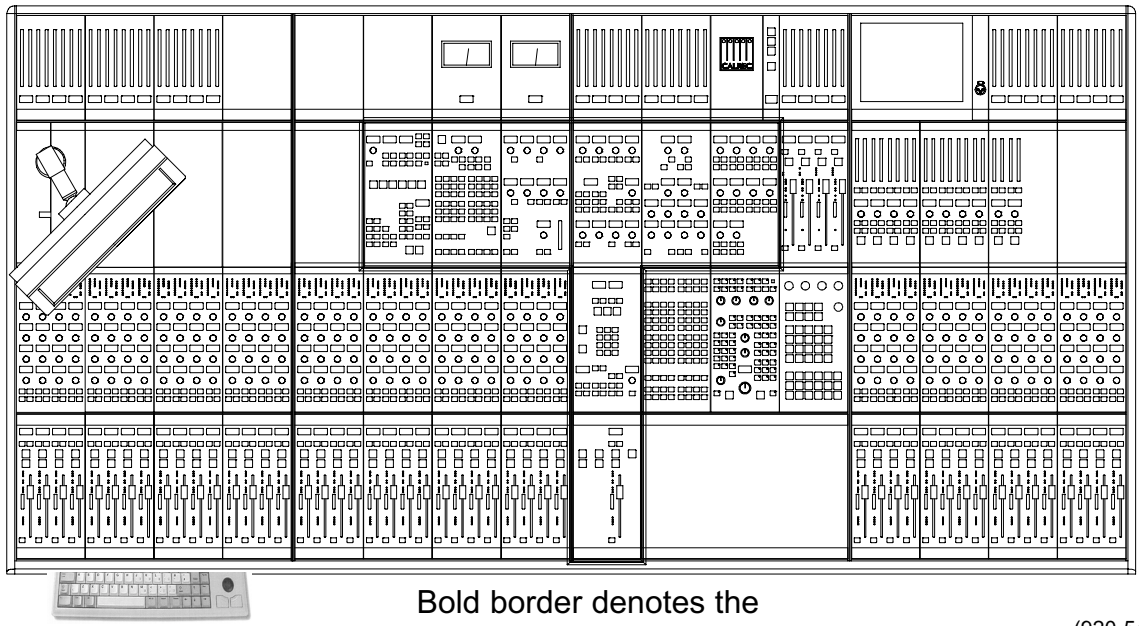
The largest frame size provides 96 faders with two audio paths on each fader. This would give more faders than the maximum number of available paths, so some B layer faders would not need to be used.

Consoles with less than 48 faders use the 48 fader frame with some blank panels.

A 48 Fader Frame Standard Layout is shown below.

Key to the bottom diagram





Bold border denotes the area of the “ASSIGN PANELS”

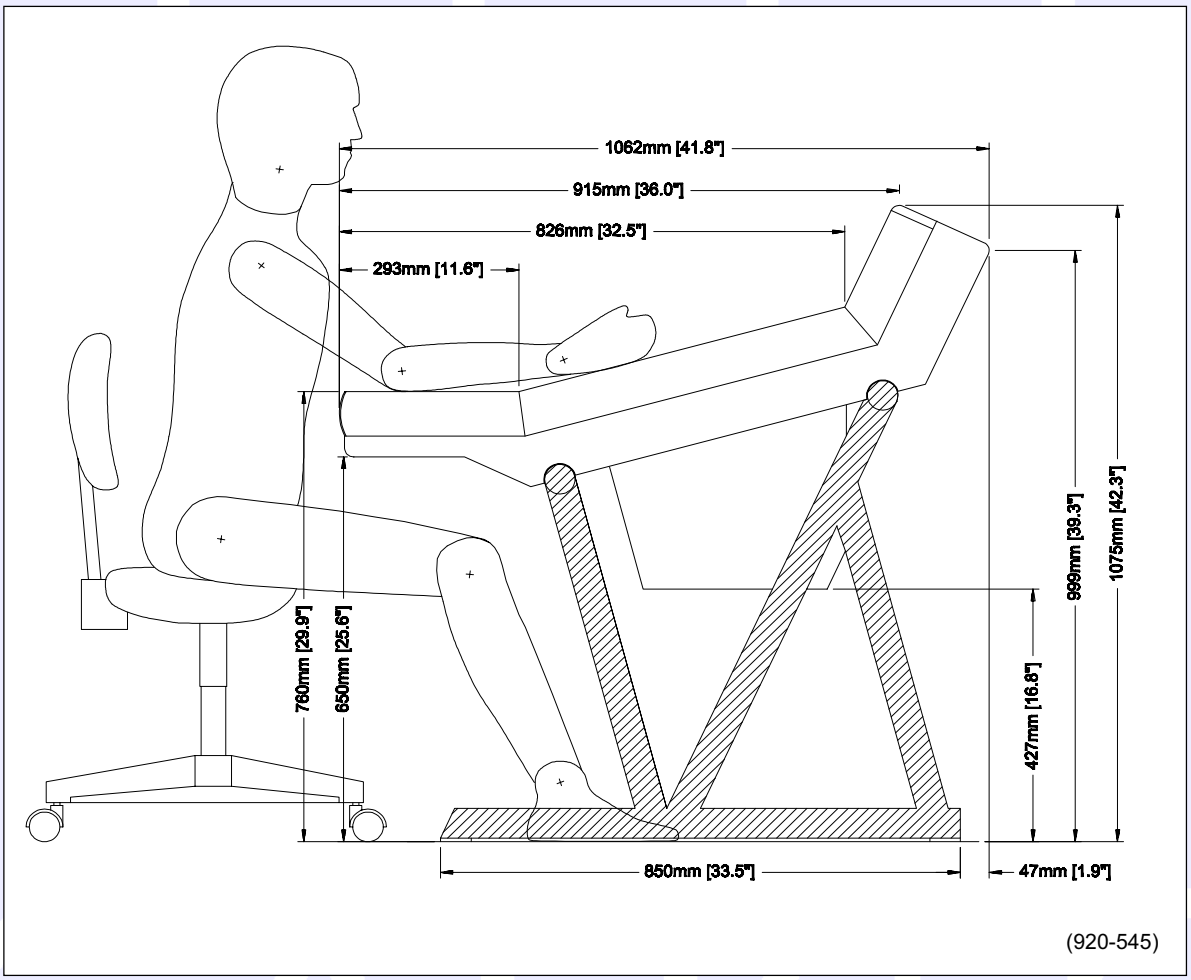
(920-543)

CONTROL SURFACE FRAME SIZES

Frame including modules & one Assign Section	Length		Approx Weight		Number of Console PSU's required (Exl. Hot spare)
	inches	mm	lbs	kgs	
48 Fader Standard Frame	80.9	2054	406	184	1
64 Fader Frame	100.8	2560	490	222	1
96 Fader Frame	140.6	3572	657	298	2
Extra 16 Fader Frame	19.9	506	84	38	

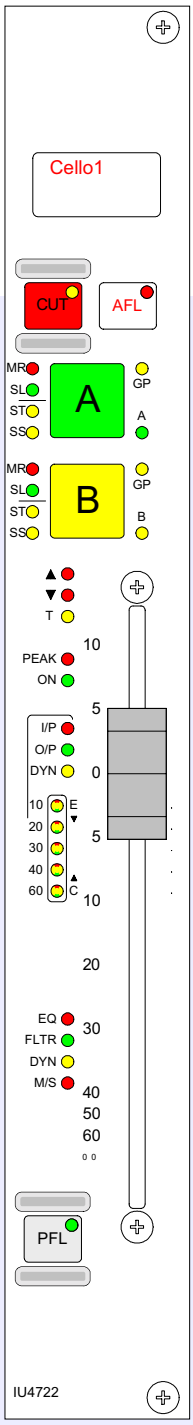
For details of custom frames, with wedge sections etc, please contact Calrec.

END PROFILE



Fader Area

"CHANNEL" FADERS



Channel and Group Paths are controlled by the console's "CHANNEL" FADERS. Any "Channel" Fader (A or B) can control any Channel or Group Path. The Main Paths are controlled by the faders on the Main Outputs Module.

The label in the display at the top of the fader module is the name associated with the channel Input selected (or the Group number). These channel input labels default to the Port ID unless a name is entered via the PC. The text shows the 'A' path in the top and the 'B' path in the bottom of the display. The colour of the label will show which fader is active at any one time: Green for A, Amber for B. The active fader path is also indicated by the A & B LEDs above the top display on the "CHANNEL CONTROL" module (situated above the "Channel" Fader).

In addition to switching between the two Paths, the A & B buttons also "CALL" the "Channel" Fader to the Assign Panels.

The CUT button cuts the channel or group. Its effect is the same as fading out the channel or group. ON buttons can be fitted instead of CUT buttons.

AFL will be heard through the monitor loudspeakers (main or small).

The MR & SL led's next to the Assign buttons indicate the Masters and Slaves of the VCA style group.

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

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

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

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

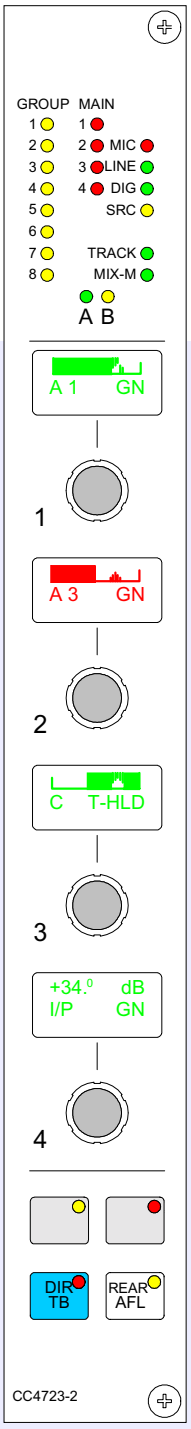
The ON led lights when the audio level is not at the ∞ position.

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

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

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).

"CHANNEL" CONTROL



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

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

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

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

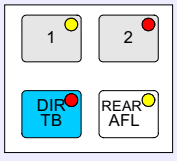
Wild Controls can be assigned either using the Functions Panel or the USER-CHAN screen. Instructions on how this is done are given on their respective pages.

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

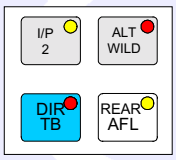
Talkback is available to Direct Outputs using the DIR TB button. All Talkback buttons are subject to On-Air inhibits, set up via the PC.

Available Options

Depending on the options purchased, the two buttons beneath the rotary controls can perform different functions.

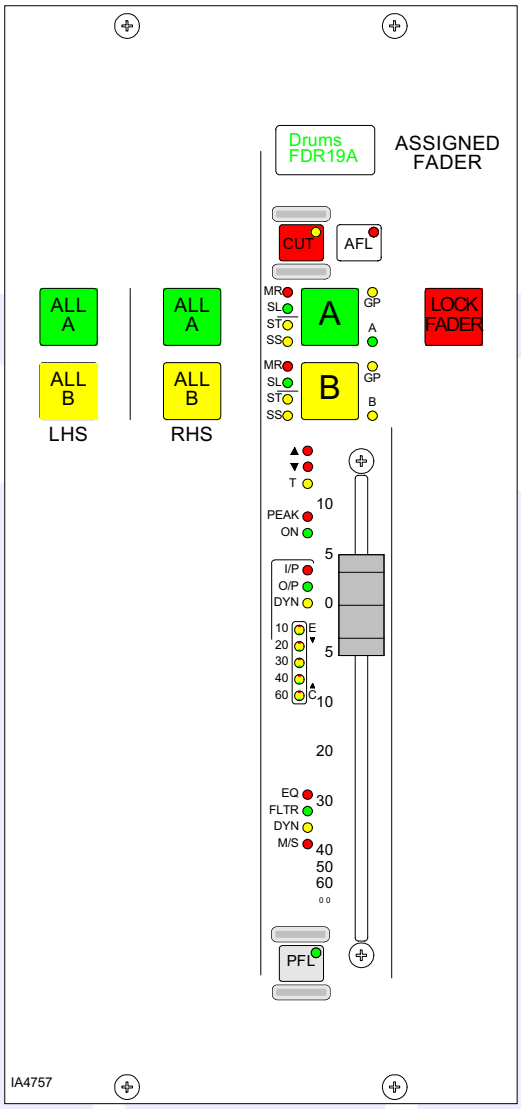


Option 1
Each channel path can select between two input ports using buttons 1 and 2. Normally, ports are assigned to input ports 1 and 2 for the currently assigned fader using the I-O Matrix. As an option, there can be buttons on this module to allow selection of the input 1 or 2. This can be either two buttons (shown left), or just one (shown below).



Option 2
The ALT WILD button allows switching between two complete sets of alternate wild settings. This would then allow up to 8 available wild controls per fader. I/P 2 allows selection between inputs 1 and 2 with just one button. Input 1 is selected when the button LED is off, and input 2 is selected with the button LED on.

ASSIGNABLE FADER



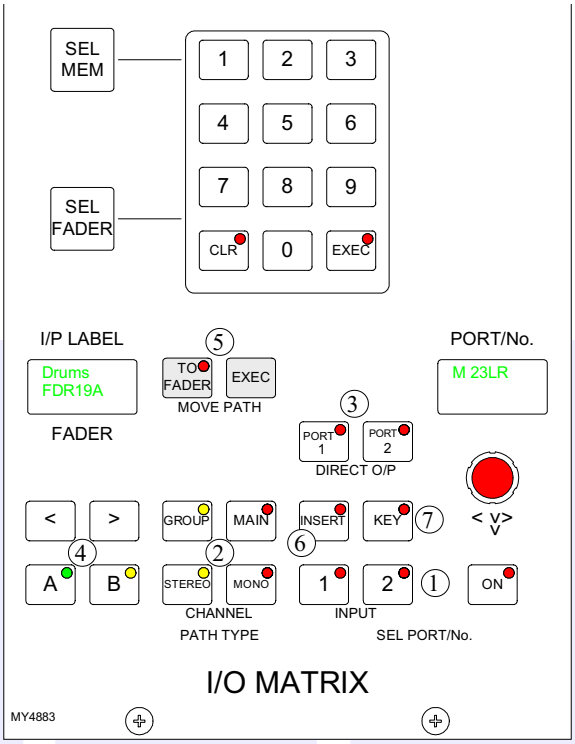
The ASSIGNABLE FADER is positioned towards the centre of the console, in the optimum listening position, and works in parallel with the last "Channel" Fader selected. Alternatively, LOCK FADER allows it to be fixed to a specific path.

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

Assign Panels

I-O MATRIX

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



(1) Port Assignment

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

Pressing the rotary control gives access to lists of other types of input port which are set up during installation of the console. Each port can be allocated to one of a number of lists to allow I/O which is wired for similar purposes to be grouped together for selection.

It is possible to determine which lists of input ports appear for selection on the I/O Matrix Panel using the Options-Miscellaneous screen. By only making the relevant lists available for selection reduces the number of times the pot needs to be pushed, to go through all the available lists.

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

(2) Path Type Selection

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

(3) Direct Output Ports

Ports can be connected to Channel and Group Direct outputs, first by selecting PORT1 or PORT2, and using the rotary control and ON button to choose and select ports. (Two ports can be connected to each Direct output). When scrolling through the lists of Direct outputs, those that are in use will display "IN USE" when the pot switch is relelased

(4) Fader Path Selection

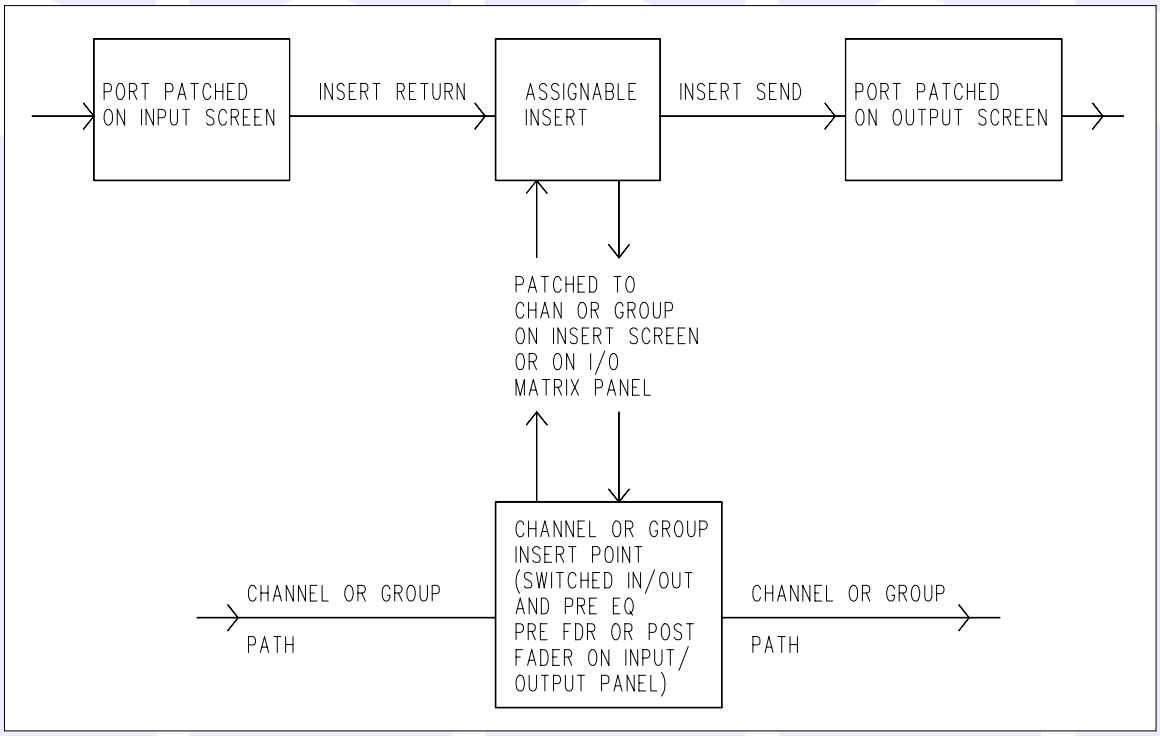
In addition to the Assign buttons on the fader modules (A & B), fader paths can be called to the Assign Panels using this panel. This is for use when pressing the fader assign button is not convenient, or should a fault develop on the fader strip. The nudge buttons (<, >,) are used to scroll through the faders, and the A and B buttons choose the path. Paths can also be selected by pressing SEL FADER and entering the fader number on the keypad. Faders can be cleared of information by pressing SEL FADER, entering the fader number on the keypad, and CLR.

(5) Move Path

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

(6) Channel & Group Inserts

The system provides up to 64 L-R pairs of assignable inserts which can be used in the stereo and mono channels and groups. In addition, the Main outputs and Control Room LS Monitor have their own dedicated inserts.



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

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

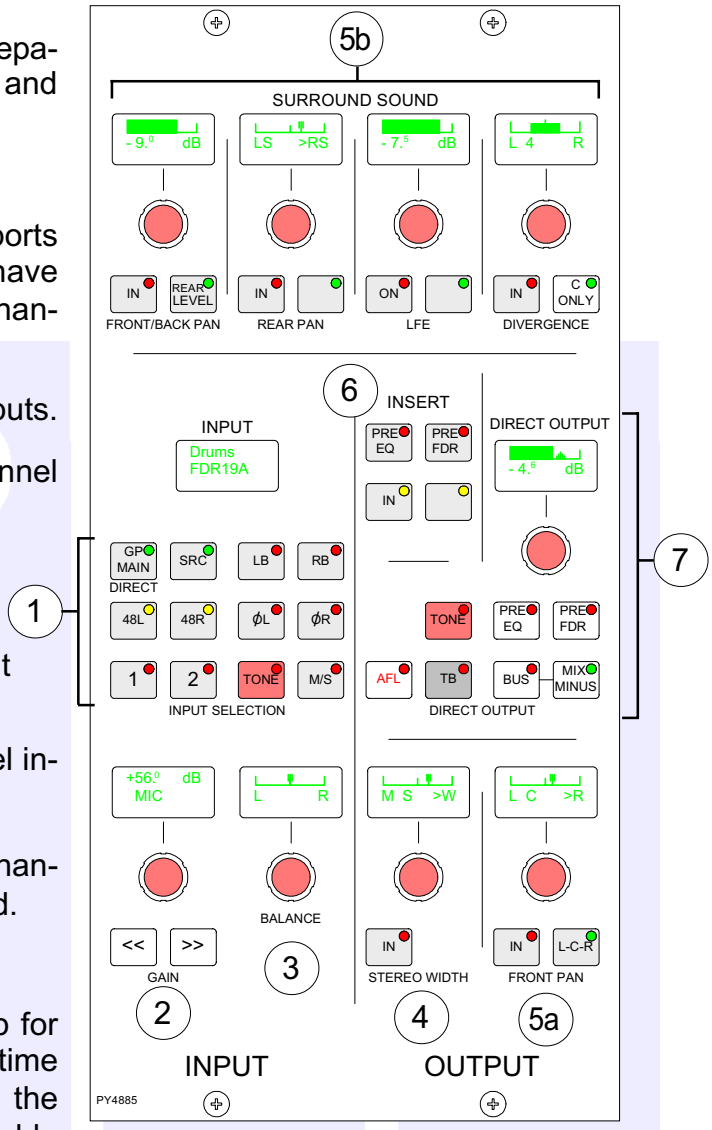
The assignable inserts can be divided into up to 4 lists in a similar way to I/O. This separates them for selection on the pot-switch.

(7) Key Input Connections

Pressing the KEY button allows the rotary control and ON button to control selection of KEY input connections.

INPUT/OUTPUT CONTROLS

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



(1) Input Settings

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

SRC switches the sample rate converter on digital inputs.

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

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

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

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

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

(2) Gain Adjustment

Comprises 2 buttons for coarse ranging plus a knob for fine adjustment. Pressing both buttons at the same time sets the Gain to 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.

(3) Balance Control

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

(4) Width Control

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

(5a & 5b) Stereo and Surround Panning

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

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

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

The LFE (Low Frequency Effects) signal has an optional Low Pass filter for each 5.1 Main output.

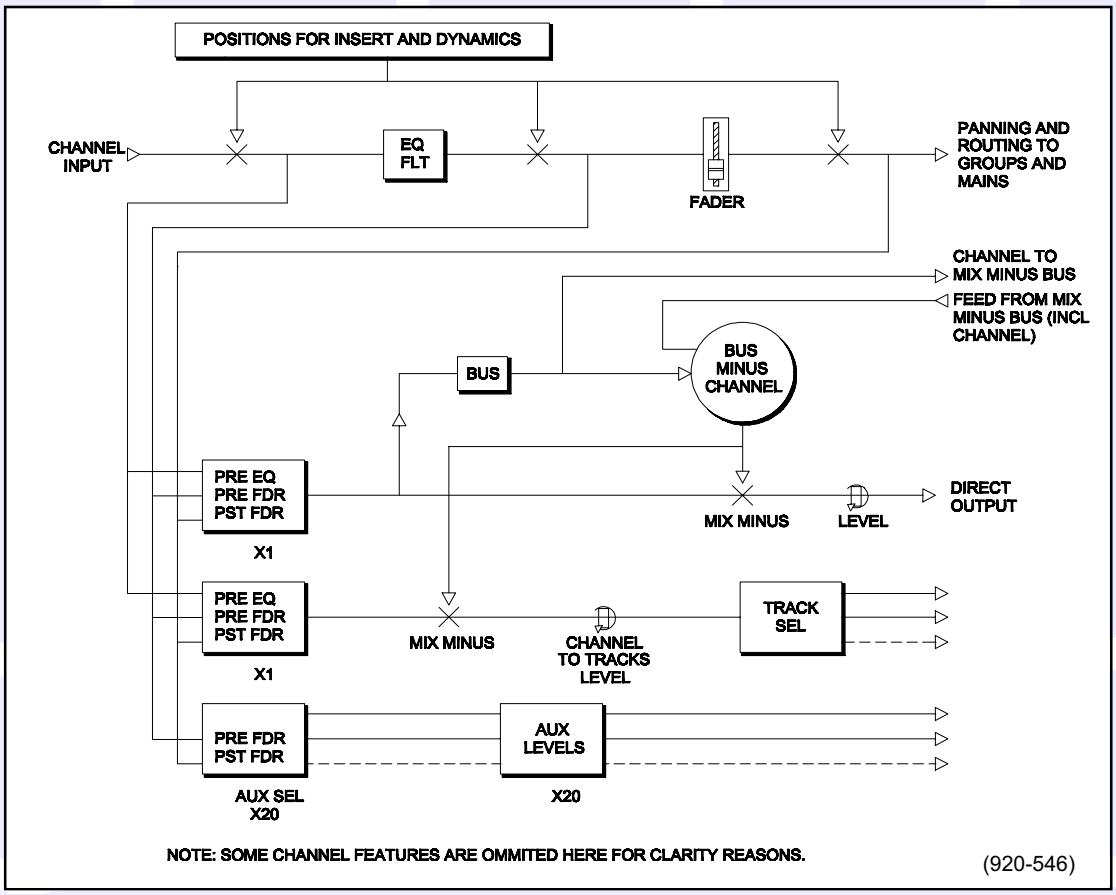
The DIVERGENCE sets an amount of the centre signal to also feed L & R. Divergence does not operate on stereo channels and groups. The C ONLY button connects the channel output to the centre BUS only. All other panning controls are disabled. The channel is fed to both L & R of stereo busses. On Stereo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

(6) Inserts

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

(7) Direct Output and Mix Minus

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

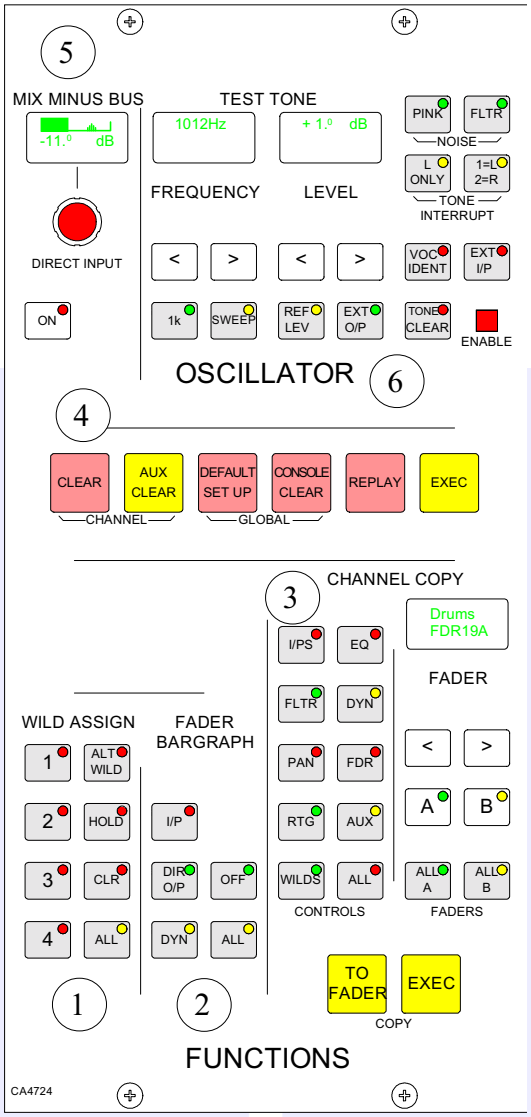


FUNCTIONS CONTROLS

(1) Assigning Wild Controls

The Wild controls are assigned either from this module, or from the Channel Functions 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:

- Call a Fader to the Assign Panels by pressing its Assign Button (A or B).
- Select WILD ASSIGN 1, 2, 3 or 4.
- Push one Assign Panel rotary control. For example, Aux 1 Send.



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

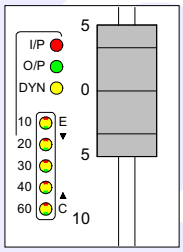
After selecting Wild 1, 2, 3 or 4, press HOLD, then a number of fader paths can be selected individually by pressing their fader assign buttons (A or B). Pushing an Assign Panel rotary control will assign that control to all selected faders.

A block or region of faders can be defined by holding down HOLD and then pressing the fader assign buttons of the first and last fader path in the required region. Pushing an Assign Panel rotary control will assign that control to all fader paths in the selected region.

It is possible to assign the same control to Wilds 1, 2, 3 or 4 for all fader paths by selecting ALL before pushing the required Assign Panel rotary control.

The ALT WILD button allows switching between two complete sets of wild settings. This would then allow up to 8 available wild controls per fader.

Aux output controls cannot be assigned to Wild controls. If the fader is touched instead of pushing an Assign Panel rotary control, then the fader for the alternate layer will be assigned to the Wild 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.



(2) Fader Bargraph Assignment

Buttons I/P, DIR O/P, DYN and OFF on this panel will set the function of the fader bargraph for the currently assigned fader, to either the channel input (post the input gain & the tone switching), the channel direct output, or the gain reduction of the dynamics. If ALL is pressed first, all fader bargraphs will be set to the selected function. Fader Bargraph assignment is also definable using the Channel Functions

(3) Channel Copy

Also controlled from the functions panel is Channel Copy. Nine sections of a channel or ALL together can be copied to another channel or channels. The Nudge buttons (< and >), plus A & B, can select the channel to be copied by calling it to the Assign Panels.

TO FADER (flashes) allows the destination/s to be chosen. Multiple destinations can be selected on the Assign Buttons, or by using the ALL A or ALL B buttons.

The nudge buttons (and the keypad on the I/O Matrix panel) can select an individual destination, which can be in addition to any multiple destinations set. Once all the destinations have been chosen, the EXEC button executes the Copy.

If a Stereo channel's settings are copied to Mono channels, only the relevant settings will be copied. Other settings on the Mono channels will be reset to the cleared down state. If Groups or Mains are included in the selected destinations, they will simply be ignored.

- I/Ps copies the LB, RB, ∅L, ∅R, M/S & Balance settings (only ∅ for a mono channel) for inputs 1 & 2, and also the Input Gains, SRC or Phantom Power when the inputs are of the same type.
- EQ and FLTR copy the EQ and Filter settings including the In/Out, Alternate and Assignment (CH or 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 the Fader and Cut switch settings but not PFL or AFL selections. It does not copy VCA Group assignments.
- RTG copies the routing to Mains 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.

Copy functions can also be executed using the Copy screen.

(4) Console Functions

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

The DEFAULT SET-UP button will recall the Default Memory, which should be created upon installation of the Alpha 100 using the Tech-Info screen. This default memory could contain the input port set-ups which match the studio wiring, and settings for relays, optos, and running levels. All channel settings could be set to OFF or flat, with no routes made. This default memory could be available as a start up memory, from which more specific memories could be created.

(5) Mix Minus Bus & Direct Input

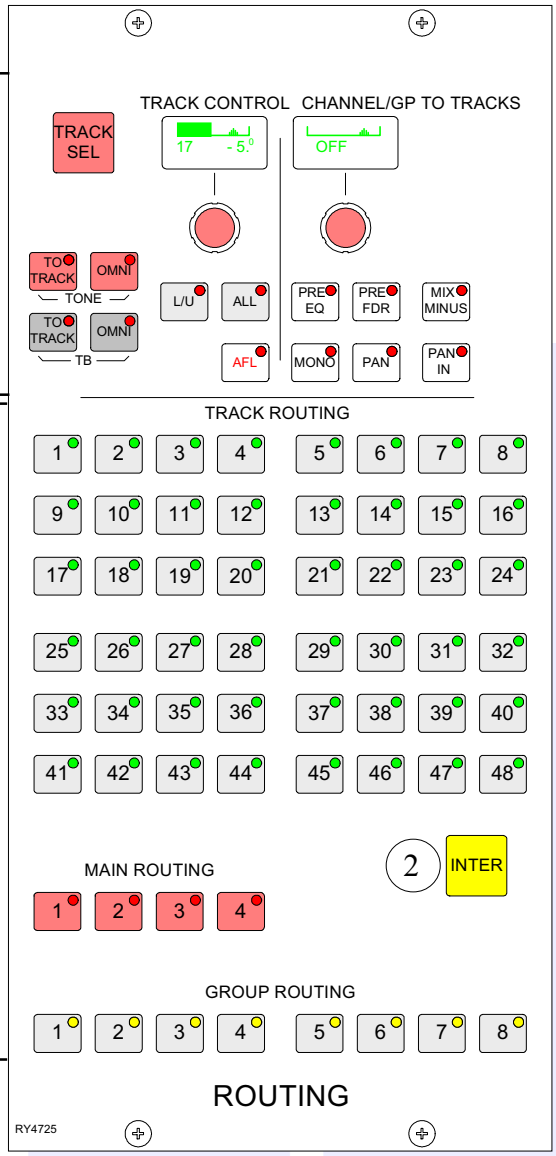
The Mix Minus bus and the Direct Input are switched ON or OFF using the button, and a rotary control is provided for level adjustment. The port for this is patched on the I-O Input screen.

(6) The Oscillator - The Oscillator controls are described on page 45.

ROUTING PANEL

Routes for the selected channel can be made or removed by pressing the numbered buttons on the routing panel.

To route several adjacent channels to one bus, the nudge buttons (on the Functions or I/O Matrix module) can be used to quickly select the channels.



3

(2) 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. 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 Input-Output Panel.

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

1

(3) Tracks (General Purpose Bus Outputs)

The Channel/Group to Tracks section controls the signal, from the channel or group, feeding the track routing selector.

PAN makes the control into a Pan control (Balance on stereo paths). Routing is Left to Odd tracks, Right to Even tracks.

On Stereo paths, the Mono button switches the Balance control off. The Mono signal can then be routed to any track.

The Mix Minus, Pre-EQ and Pre-Fader buttons act as a cancelling set. When none are selected the signal is sent to the track routing selector Post-Fader. Mix Minus feeds the Mix Minus signal of the channel or group, as set up on the Direct Output section of the Input/Output panel, to the Track Routing selector.

The Track Control section of the Routing module, controls the output to the multi-track, after the track mix. These outputs can also be used as IFB or general purpose bus outputs. The number of outputs available will depend on the option fitted. 48 optional bargraphs can be fitted to monitor the output level.

To track output being controlled is selected by the Track Sel button plus the track routing buttons 1-48. ALL makes the control a Master, controlling all the tracks at once.

Tone or Talkback can be fed to the selected track output. The OMNI buttons feed tone or talkback to all the track outputs.

TALKBACK

Talkback is available to all groups, mains, auxes and 8 external sources (via relay switching) using the buttons on this panel. Talkback is also available using the buttons on the channel control modules, Input/Output panel and Routing panel, to Direct Outputs and individual tracks.

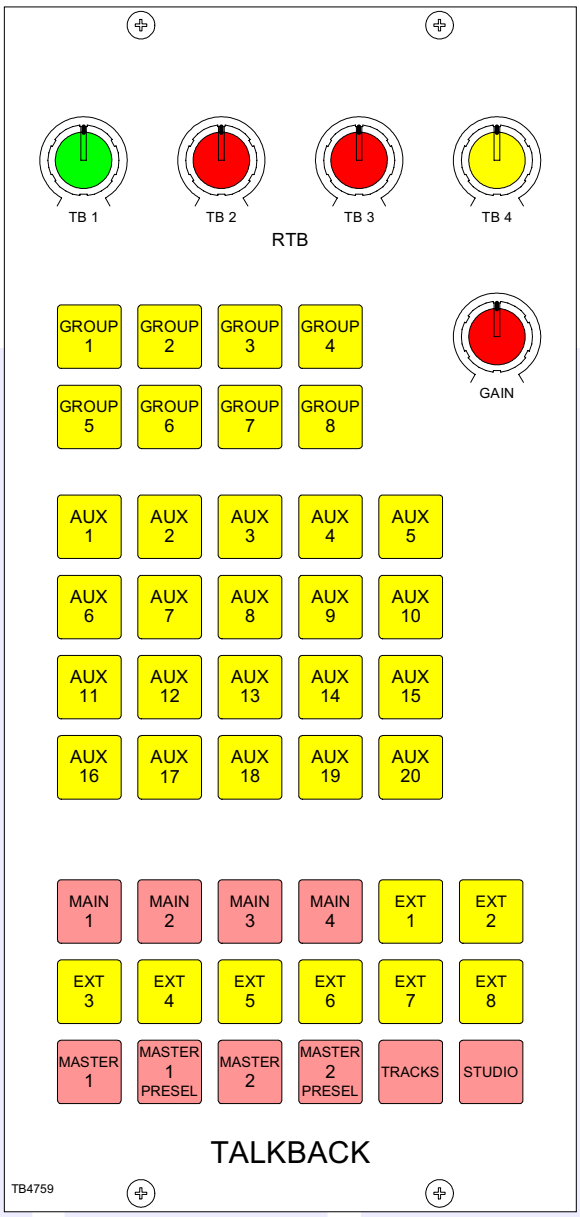
MASTER 1 and 2 operate all the TB buttons which have been preselected by the respective PRESEL button.

All Talkback buttons are subject to On-Air inhibits, set up on the TX/REH screen.

The GAIN control sets the level of the TB Mic.

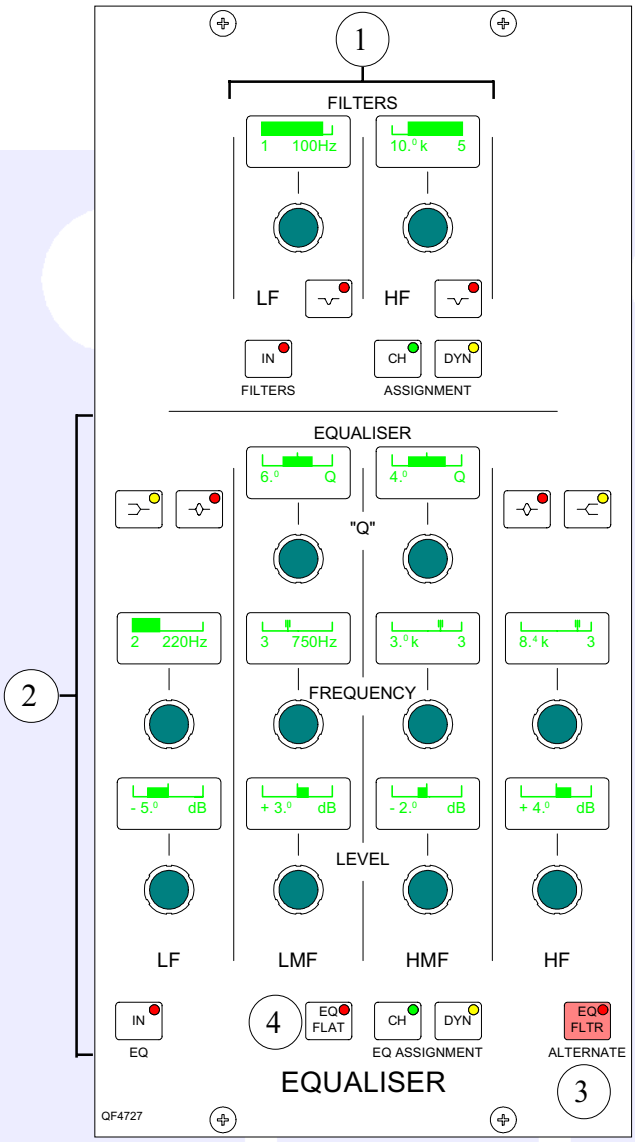
TB1 to TB4 set the level of 4 RTB (Reverse Talkback) signals.

There can be a mix of all four signals to feed a single loudspeaker. This can mix with the PFL feed to the PFL LS and/or switch onto the Desk Headphones output (requires external RTB ON signal).



EQ & FILTERS PANEL

The Equaliser module controls EQ & Filters on the Channel paths only. Excessive control ranges are deliberately avoided to simplify operation. Once a channel has been selected by pressing it's Assign button (A or B), it's frequencies can be adjusted using the following controls.



(1) Filters

LF 12dB/octave plus notch, 20Hz to 330Hz
HF 12dB/octave plus notch, 3.3kHz to 20kHz

(2) Equaliser

LF 30Hz to 470Hz, shelf or bell (Q of 1)
LMF 160Hz to 2.4kHz, Q from 0.3 to 10
HMF 500Hz to 7.5kHz, Q from 0.3 to 10
HF 1kHz to 16kHz, shelf or bell (Q of 1)

EQ level controls are adjustable by ±15dB

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

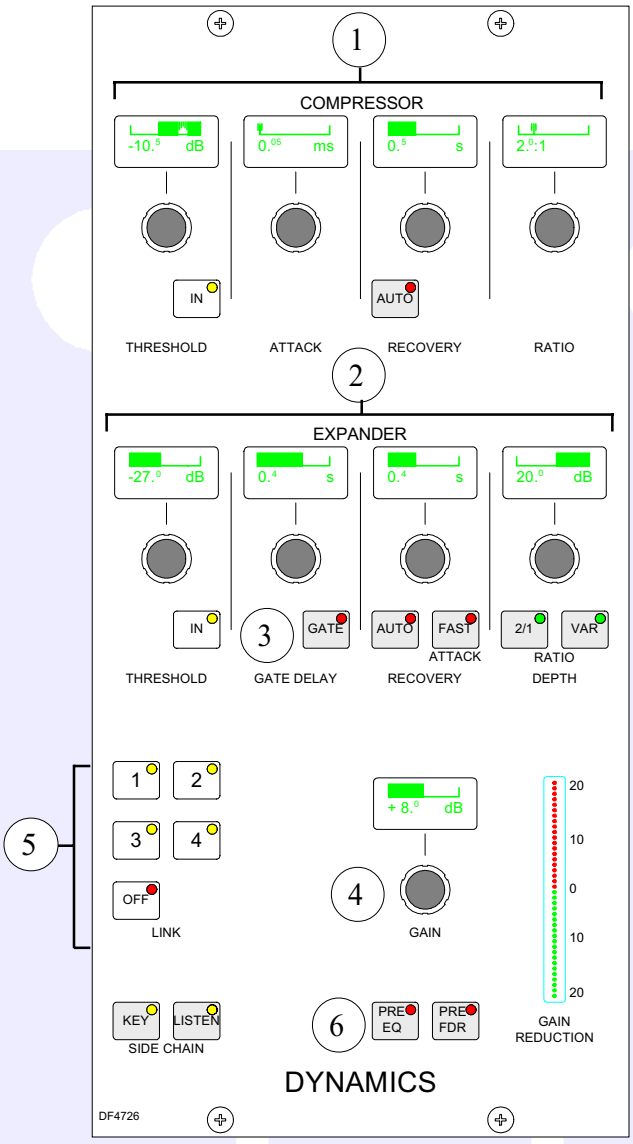
The EQ and Filter sections each have two assignment buttons. The CH buttons ensure that the EQ and Filters are switched into the assigned channel's path, and the DYN buttons allow the EQ and Filters to be switched in and out of the dynamics of the assigned channel. These buttons are not mutually exclusive, EQ and Filters can either be in the channel path or the dynamics, but not both at the same time. Selecting DYN will de-select CH and vice-versa.

(3) The ALTERNATE EQ FLTR button allows switching between two complete sets of EQ and Filter controls.

(4) EQ FLAT will clear any EQ settings to flat.

DYNAMICS PANEL

The Dynamics module controls Compressor and Expander or Gate, on Channels and Groups, and Compressor on Main outputs. Once a channel has been selected by pressing it's Assign button (A or B), it's dynamics can be adjusted using the following controls.



(1) Compressor:

Threshold +20dB to -20dB

Recovery 75ms to 4 sec + AUTO
Ratio 1 to 50
Attack 50µs to 5ms

(2) Expander:

Threshold 0dB to -40dB
Recovery 75ms to 4 sec + AUTO
Depth 0dB to 40dB
Fast attack 300µs (normal 16ms)
Ratio 2/1 and VAR (variable - according to level)

(3) Gate:

Threshold 0dB to -40dB
Recovery 75ms to 4 sec + AUTO
Depth 0dB to 40dB
Fast attack 300µs (normal 16ms)
Gate delay 0 to 1 sec in addition to 6dB hysteresis

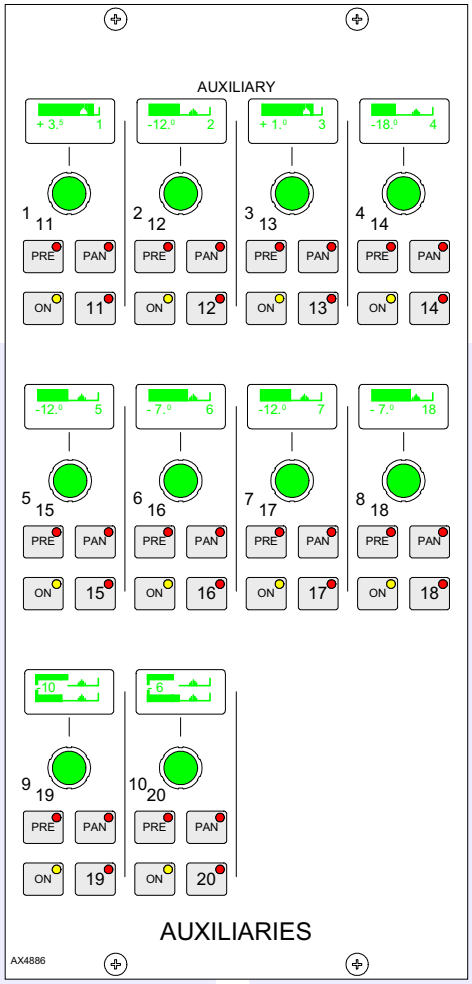
(4) Make up gain is adjustable from 0dB to +20dB.

(5) It is possible to have the dynamics of many channels linked by assigning them to one of four available link busses. This is useful for when the same dynamics settings need to be applied to more than one channel, for example, when 4 channels represent a 5.1 signal. With the channel selected, press 1, 2, 3 or 4 to assign the channel to the bus.

(6) The dynamics can be applied Pre EQ or Pre Fader. The Pre EQ button will not function on Group & Main paths.

A 0dB setting on the dynamics equates to the chosen reference level for the console.

AUXILIARIES PANEL



The Auxiliaries panel controls the feeds from the channels or groups to the auxiliary output busses. Each feed can be Pre or Post the channel or group fader.

The Auxiliary buses are pre-set to be mono or stereo using the USER BUSSES screen shown below. For example, aux 9 is stereo, then aux 19 will not be available (and Aux 19 will not work on the monitor selector).

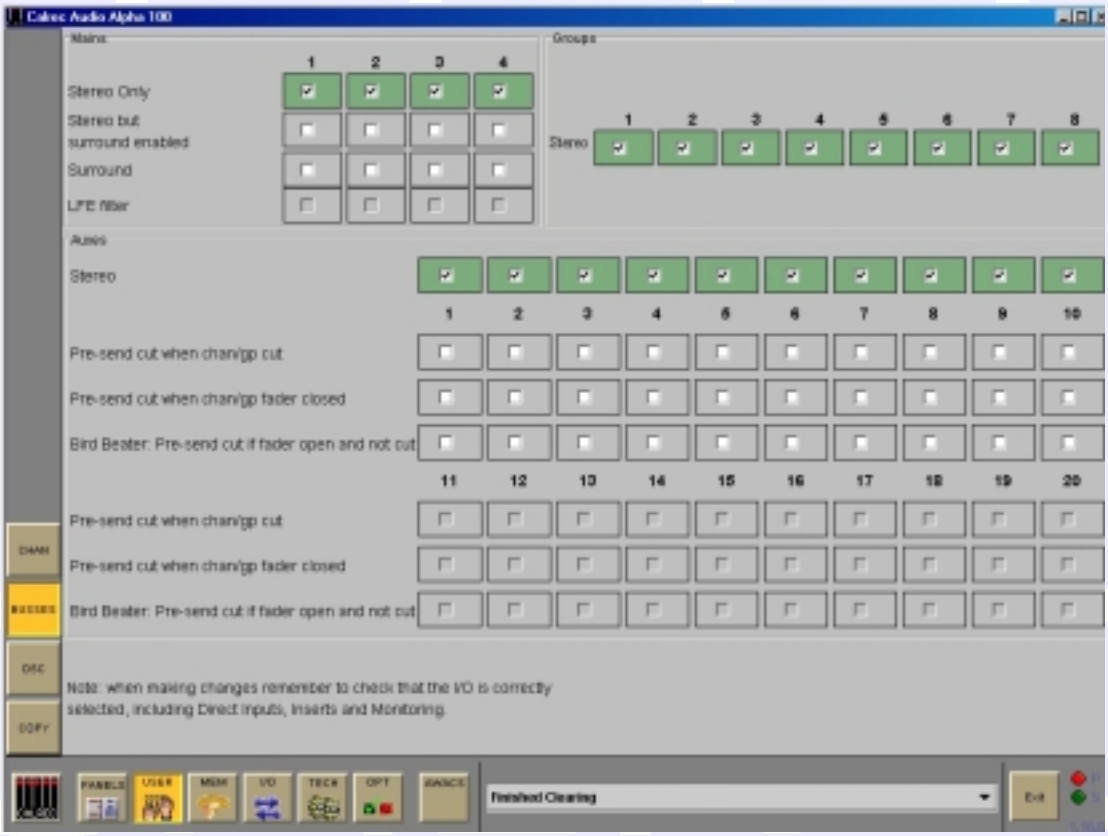
On stereo auxiliaries a dual level display will be shown. For example, aux 9 & 10. Here buttons 19 & 20 will be inoperative.

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.

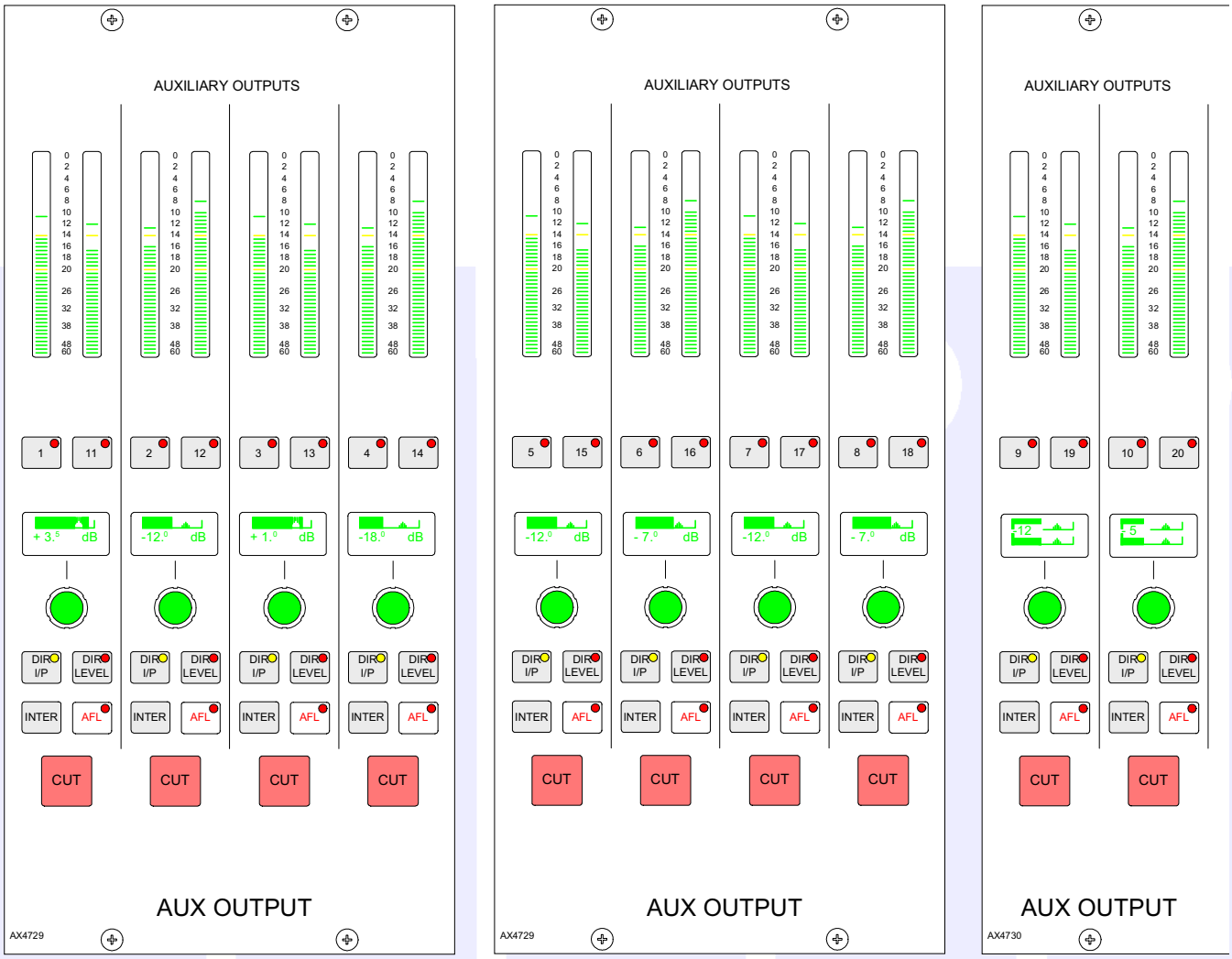
On mono auxiliaries, buttons 11 to 20 switch the control to that numbered aux send. The Pan button will be inoperative.

USER-BUSSES Screen

This screen is used to define Main, Group or Auxiliary busses as Mono, Stereo or Surround. For Auxiliary Busses, options are available for pre-send cut when the fader is closed to be enabled.



AUX OUTPUT PANELS



These modules control the Auxiliary outputs.

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.

On Stereo auxiliaries a dual level display will be shown, for example, aux 9 & 10. Here buttons 19 & 20 will be inoperative. There cannot be a level offset on the output display.

It is possible to discover which fader paths are feeding each of the aux output busses by holding down the Interrogate button (momentary). The fader assign buttons of all the paths feeding that bus will light. Paths can be added or removed from the bus under interrogation, by selecting or de-selecting their fader assign buttons.

DIR I/P switches on the direct input to the auxiliary bus.

DIR LEVEL makes the Aux output control into the direct input level control.

MAIN OUTPUTS PANEL

The ASSIGN BUTTON on each Main fader calls the Main output to the Assign Panels to allow; routing (of one Main to another - indicated on the routing leds above the faders), Insert on/off, and control of the Compressor and Direct input.

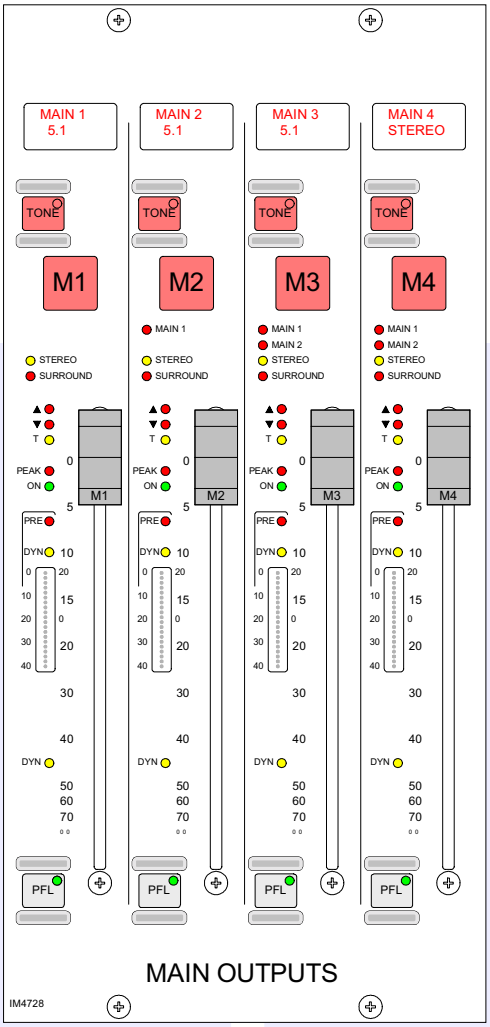
Each Main output can be pre-set to be either Surround or Stereo. Surround Mains are 5.1 plus a Rear downmix to allow a simultaneous LCRS. There is also a Stereo downmix and a Mono downmix (potentially 10 outputs for each Surround Main).

The Insert and Direct Input are also Surround.

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

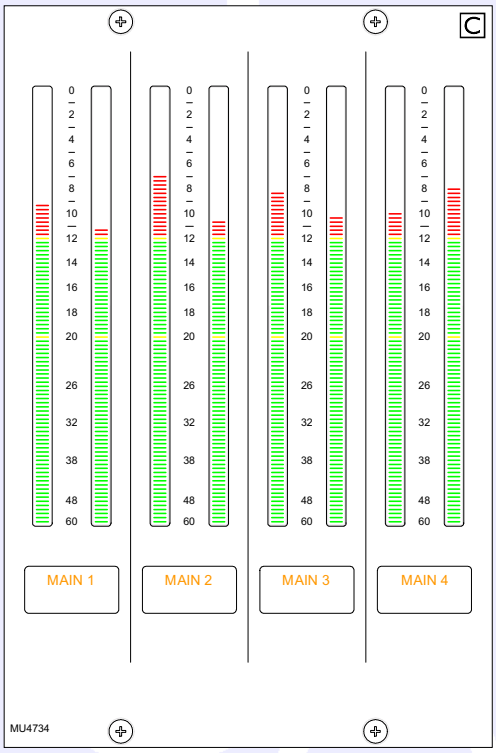
The Main Output Meters display the stereo downmix if the output is Surround.

If the Main Line Monitor is set to be fed back from the Studio Distribution via external inputs to the desk, then the meters will display this instead.



MAIN OUTPUTS

MAIN METERS

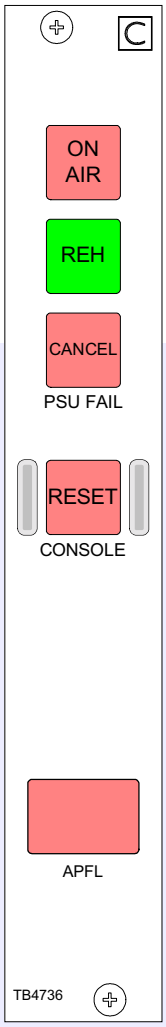


The MAIN METERS can be Stereo only, Surround only, or Surround plus Stereo (displaying a downmix of the Surround signal). There can be a separate M/S meter (fed from the same downmix). They can be PPM's, VU's, Bargraphs, Phase display incorporating bargraphs, or a mixture of these.

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

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

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 OPTO screen.

The OPTIONS-TX REH screen allows the condition switching for the system to be set up, whereby many different functions can be set to be active, or not, in any of the three states. This can significantly reduce the risk of human error when in the various modes, making the whole system a more robust, less stressful, user friendly environment for operators to work in.

Power Supply Monitoring

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

AWACS

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

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

Console Reset

Pressing the CONSOLE RESET button resets the Control System only. Independent DSP operation ensures audio continuity during console reset. The most recent console settings will be fully restored in less than 10 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.

MONITOR SELECTOR & LS PANELS

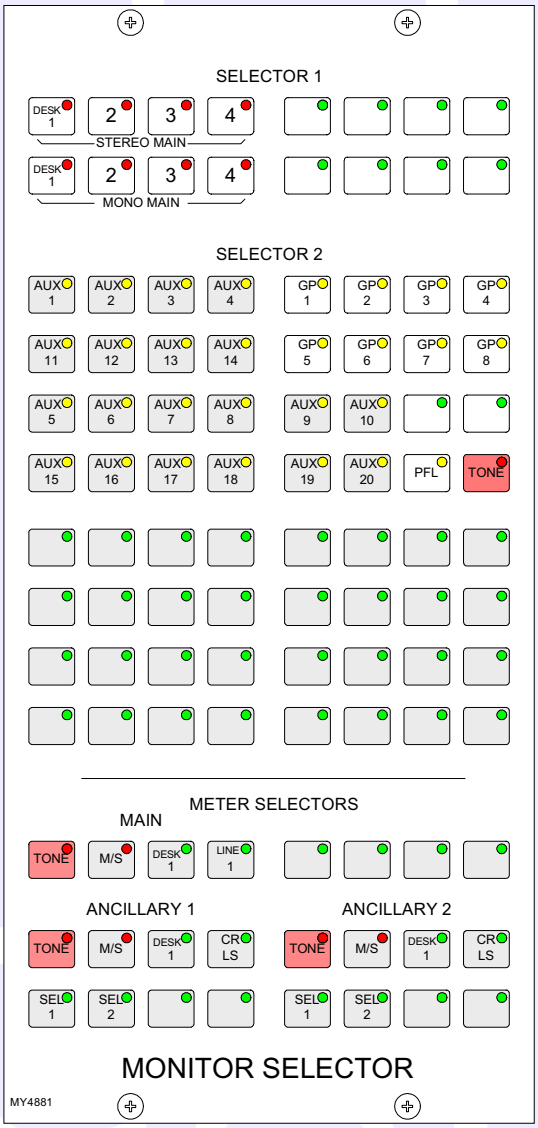
All SELECTOR external inputs can be Mono, Stereo, LCRS, or 5.1. Mono inputs are fed to L + R. SEL 1 & SEL 2 are sub-selectors which feed the other selectors.

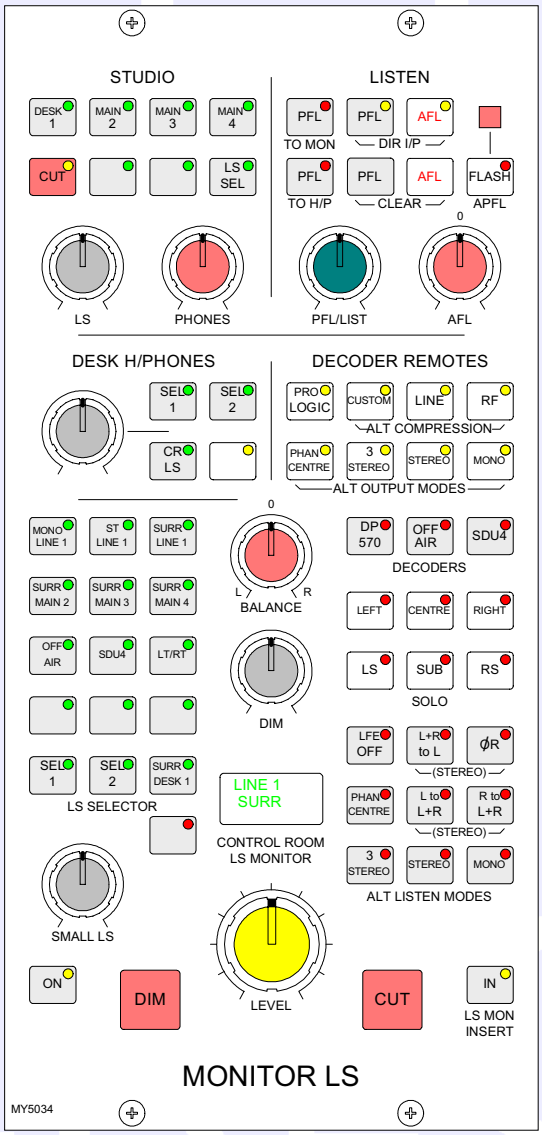
The Main meter is in addition to the four stereo Main Output meters, which meter the stereo downmix of the Main output, if the Main is surround.

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.

Both the Main and Anc 1 meters have a Tone switch to send Tone directly to the meter. They can both be Stereo only, Surround only, or Surround plus Stereo, with an optional separate M/S (L-R sum/difference) meter. If the M/S meter is fitted to either of them, their M/S button will be blank.

The Ancillary 2 Meter can be selected to meter the Control Room LS monitor selection, Main 1 Desk, Sel 1 or 2, or 2 external inputs. It is stereo only with an optional separate M/S (L-R sum/difference) meter. When metering surround signals, it displays the stereo downmix.





The SMALL LS level control can be in series with or seperate from the Main LS level control. The ON 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.

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 surround signal is monitored on a stereo LS or Meter, only the L & R signals will be monitored. If a Main o/p is surround, the surround monitor buttons for that Main o/p will work but the stereo ones will not. If a Main o/p is stereo, the stereo monitor buttons for that Main o/p will work but the surround ones will not.

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

ALTERNATIVE LISTENING MODES: All off indicates NORMAL (Mono, Stereo or Surround depending on the source selected and the LS arrangement).

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

ØR, L+R to L, L to L+R, and R to L+R will work in any mode, but are really designed for use in STEREO mode or when monitoring Stereo sources.

MONO feeds L, C, R, LS & RS to L + R.

An INSERT point is provided after the LS SELECTOR, for a Dolby DP570.
Any of the selector signals can be fed through this. Alternatively, the DP570 can be wired to the Main LS output, before the LS amplifiers.

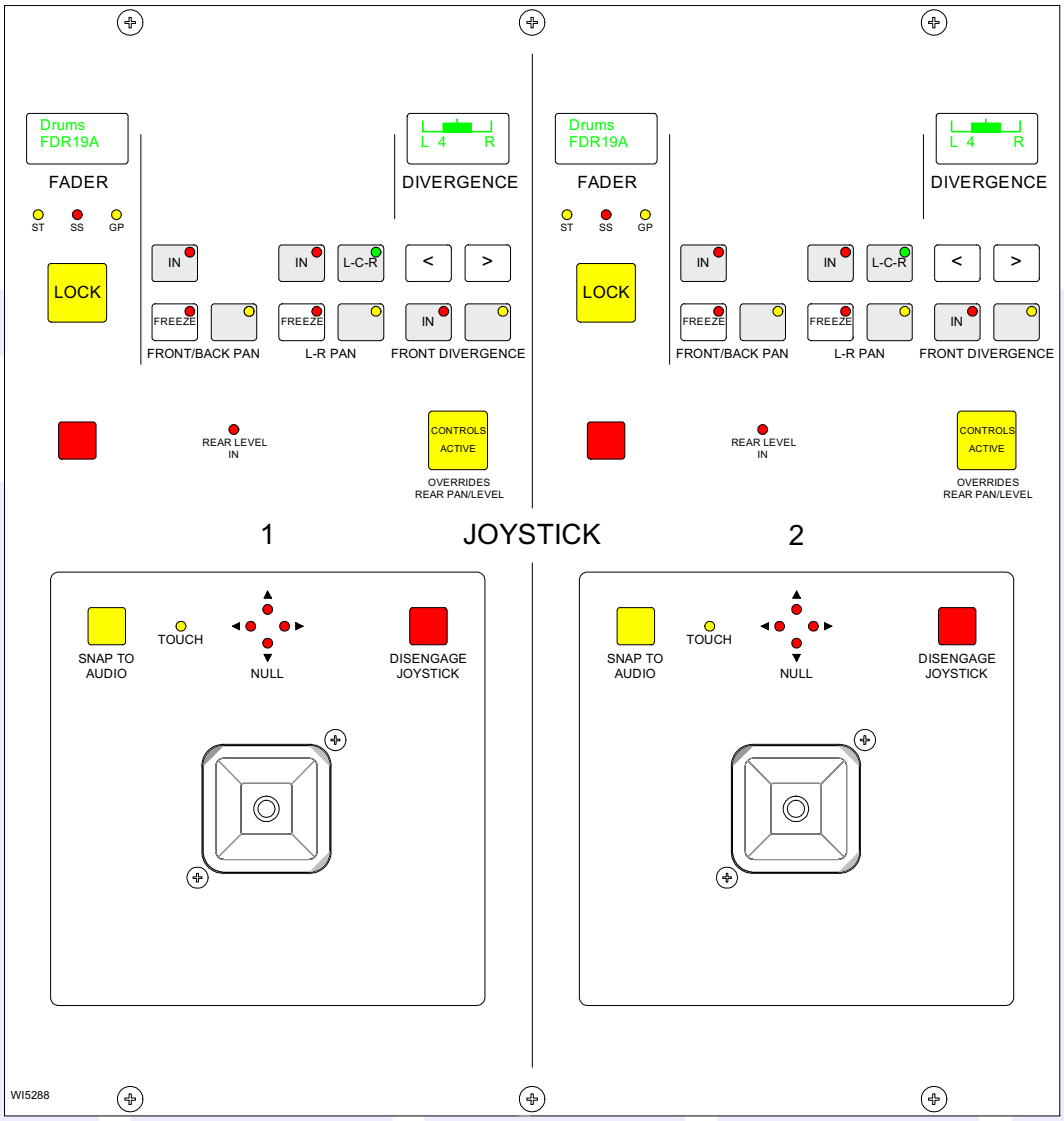
AFL feeds the Control Room LS outputs (post the surround panning controls), overriding the LS SEL. PFL can also do this if PFL TO MON is selected (overrides AFL). If PFL to MON is not selected, PFL can override the Small LS (if it has been set to do this). Alternatively, there can be a separate stereo PFL LS output. An external RTB input can mix with PFL to the PFL LS output. PFL clear & AFL clear, clear any latched buttons.

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

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

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

JOYSTICK PANEL (OPTIONAL)



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

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

LEDs show the type of path being controlled:

SS - Indicates a surround sound main.
ST - Indicates a stereo source.
GP - Indicates a group.

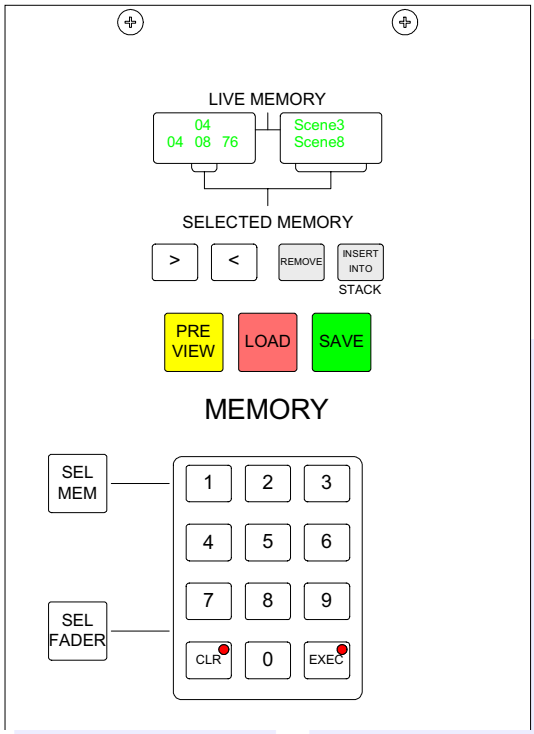
Front/Back pan, L/R Pan and Front Divergence each have a set of dedicated controls. Each has an IN button to enable the function. The IN buttons and L-C-R button work in parallel with the buttons on the Input/Output panel. The blank buttons are there so that additional features can be implemented in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

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

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

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

MEMORIES



99 memories can be held in the Flash ROM for different console arrangements. In addition to this, the PC back-up can allow an unlimited number of memories, which can be called into the Flash ROM quickly and easily. Memories can be stored to removable media such as floppy disk. This can be useful for when many different operators use the same console (for example an Outside Broadcast vehicle), or when the console is used to broadcast many different weekly productions.

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

The Live Memory is the current memory loaded onto the console.

The Selected Memory can be thought of as the “Ready” position, where the operator can place the next required memory until it is needed. The buttons on this panel will affect the Selected Memory.

Pressing LOAD will instantaneously launch the Selected Memory into the Live Memory position, overriding the previous console settings.

The Selected Memory can be chosen using the I/O Matrix Panel, or by using the Memories Screen (shown opposite). The Select Memory (SEL MEM) button plus the keypad, allows any memory number to be called into the Selected Memory position. Press SEL MEM, and enter the two digit memory number followed by EXEC to call up any memory. The Selected Memory can also be chosen by clicking on the required memory in the Flash Rom list (1) on the left of the Memories Screen.

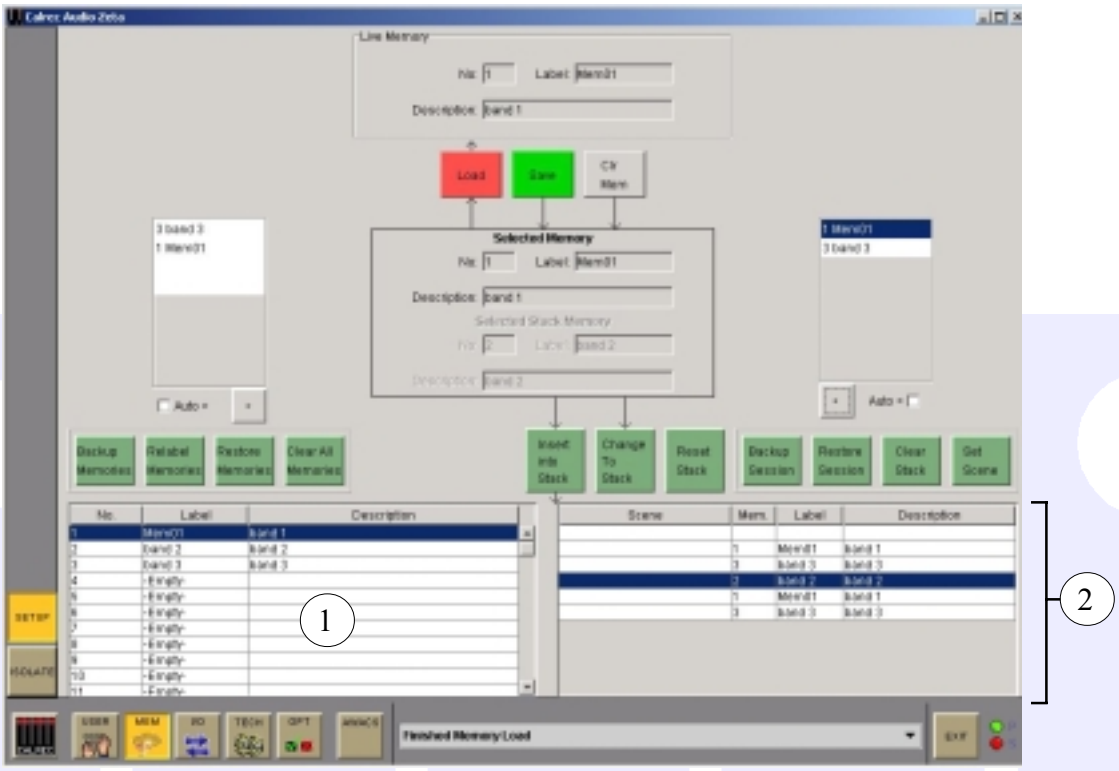
The Save button will save console settings to the Selected Memory. Therefore, the memory to which you want to save must be in the Selected Memory position when Save is pressed. Alternatively, SAVE+Memory Number + EXEC will save into that memory number.

To save to a new memory, call an empty memory into the Selected Memory position either by selecting it from the Flash ROM list on the screen (1), or by pressing SEL MEM and typing it’s number on the keypad. SAVE will now save changes to the new memory, and the PC can be used to change the title of the memory being saved. If however, you wish to simply update changes you have made to the Live Memory, it must be showing as both the Live Memory and the Selected Memory in the display.

The contents of the Selected Memory can be cleared by pressing SEL MEM + CLR on the keypad or clicking on Clear Memory on the screen.

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

Stacked Memories



(2) The memories can be arranged into a Pre-set list, known as a Stack. This can be useful for setting up an easy-to-access shortlist of specific memories for use during a show.

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

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

The > and < buttons scroll through the Stack. Pressing both > and < together, will reset the position so that the last number loaded is back in the central position. To add a memory to the stack, ensure it is in the Selected Memory position, and press INSERT INTO STACK. Pressing REMOVE will remove a Stack memory from the Stack, or will remove a non-stack memory from the Selected Memory position. Inverse text in the display indicates that the memory is not part of the Stack.

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

Isolation

Some console settings can be isolated from memory recall, so that they will not be over-written when a memory is loaded onto the console. This is done using the screens.

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.

INPUT DELAY PANEL (OPTIONAL)

The Input Delay panel is available as an option, and allows the user to apply specific amounts of delay to each channel path.

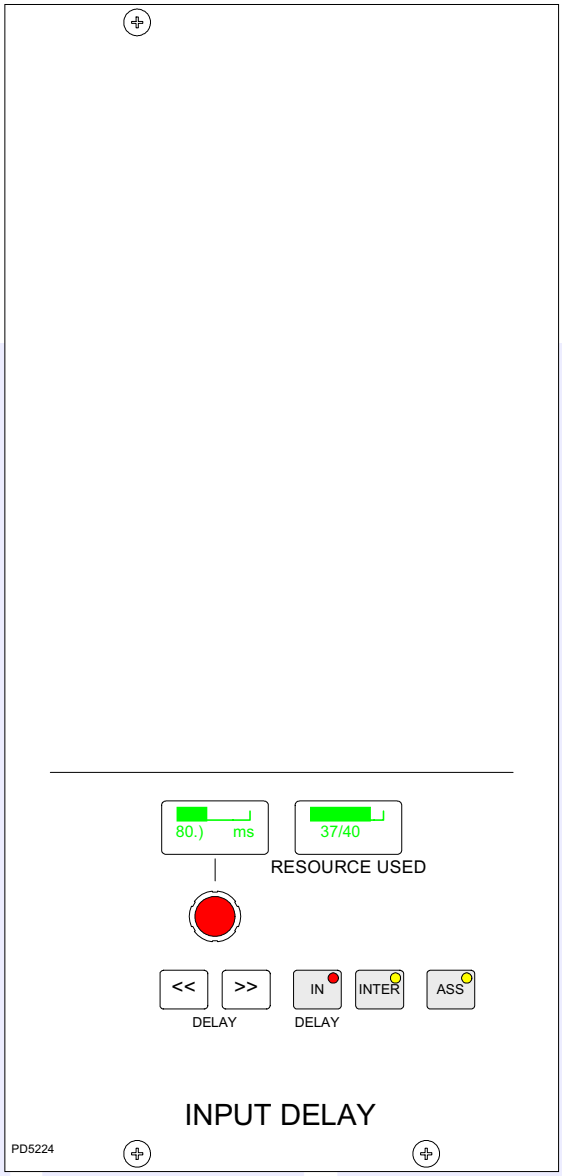
There are 42 legs of delay available for channel assignment. Stereo channels use two legs. Each leg provides up to 250 ms of delay, adjustable in 0.1ms steps using the rotary control, and 10ms steps using the nudge buttons.

The RESOURCE USED display shows how many legs are already assigned.

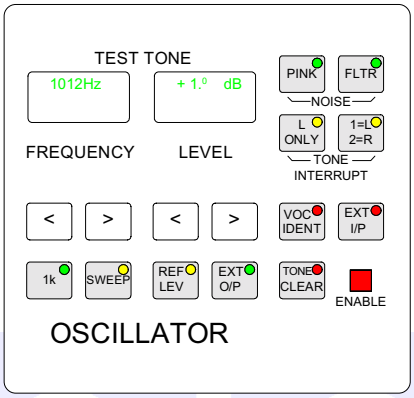
ASS : To Assign delay to a channel, select the fader path by pressing it's assign button (A or B), and then press ASS on the Delay panel. Once delay is assigned to a channel, a delay value can be setusing the rotary control or nudge buttons.

IN : Switches the set value of delay in and out of the channel's path.

INTER : Holding down the interrogate button will indicate the channels which have delay assigned by lighting their fader assign buttons.



OSCILLATOR CONTROLS



The Oscillator controls are located above the Functions controls, and are used to generate test tones with which the monitoring and metering system can be tested.

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

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.

The oscillator can be set to generate pink noise instead of a tone, by selecting the PINK noise button. The FLTR button filters out frequencies below 400Hz and above 1500Hz from the pink noise generated.

The Tone Interrupt buttons are useful for testing stereo monitoring and metering because they allow the tone to be interrupted on the Left side only, or on the Left and Right sides in an alternating pattern.

VOC IDENT replaces the tone with a vocal sequence, allowing testing with a human voice.

EXT I/P when pressed replaces the tone with an external source of your choice. This allows for external oscillators to be used if preferred.

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

The Enable LED is lit to show that the Oscillator controls are enabled.

Oscillator controls are also adjustable using the Oscillator Screen.

METERING OPTIONS

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

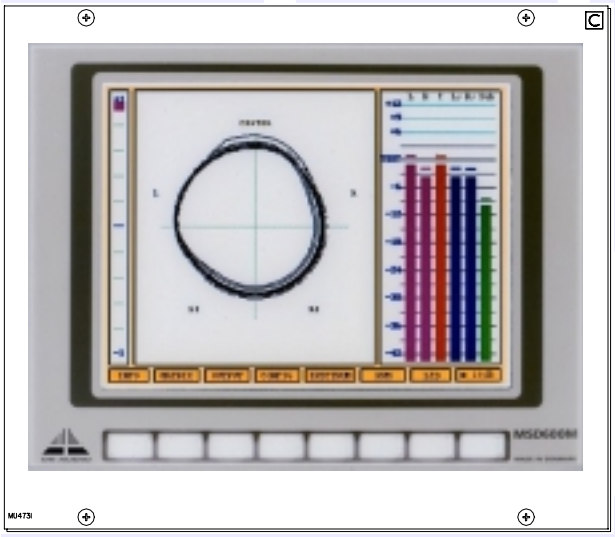
- Track Bargraphs displaying the Track output levels, post Tone &TB. The number fitted would depend on the number of Track output paths fitted.
- ANCILLARY 2 Meter: This is Stereo only. It can be PPM's, VU's or Bargraphs.
- Stereo or Surround APFL Bargraph. AFL is monitored post the channel/group panning and PFL on a surround Main output is in surround. If the APFL meter is stereo on a desk being used for surround, it will display the stereo downmix of these signals.
- MIX MINUS: Single Bargraph displaying signal on the Mix Minus bus (Mono).
- GROUPS: 8 Stereo bargraphs for the Groups. For Mono groups, the meter will display the left bar only.It is possible to rearrange the meters to put the Group meters further to left at the expense of the positions of the other meters.

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

Calrec bargraphs provide a bar which can be either VU, PPM, or selectable between the two. In addition, there can be a True Peak spot (which incorporates a long release time). Together, these allow the operator to see the level of the signal using a familiar meter and at the same time to see how close the peaks of the signal are to the digital maximum. If it is the customer's policy to use a peak limiter in the programme output, the peak spot can be disabled.

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

The Meter Bridge is continental height allowing alternative European bargraph meters to be fitted. These would need additional audio outputs from the DSP.



OPTIONAL THIRD PARTY METERING

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

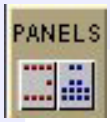
This meter can show Stereo only, Surround only, or Surround plus Stereo (displaying a downmix of the Surround signal). There can be a separate M/S meter (fed from the same downmix). They can be PPM's, VU's, Bargraphs, Phase display incorporating bargraphs, or a mixture of these.

Screen Operation

SCREEN USAGE & LAYOUT

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

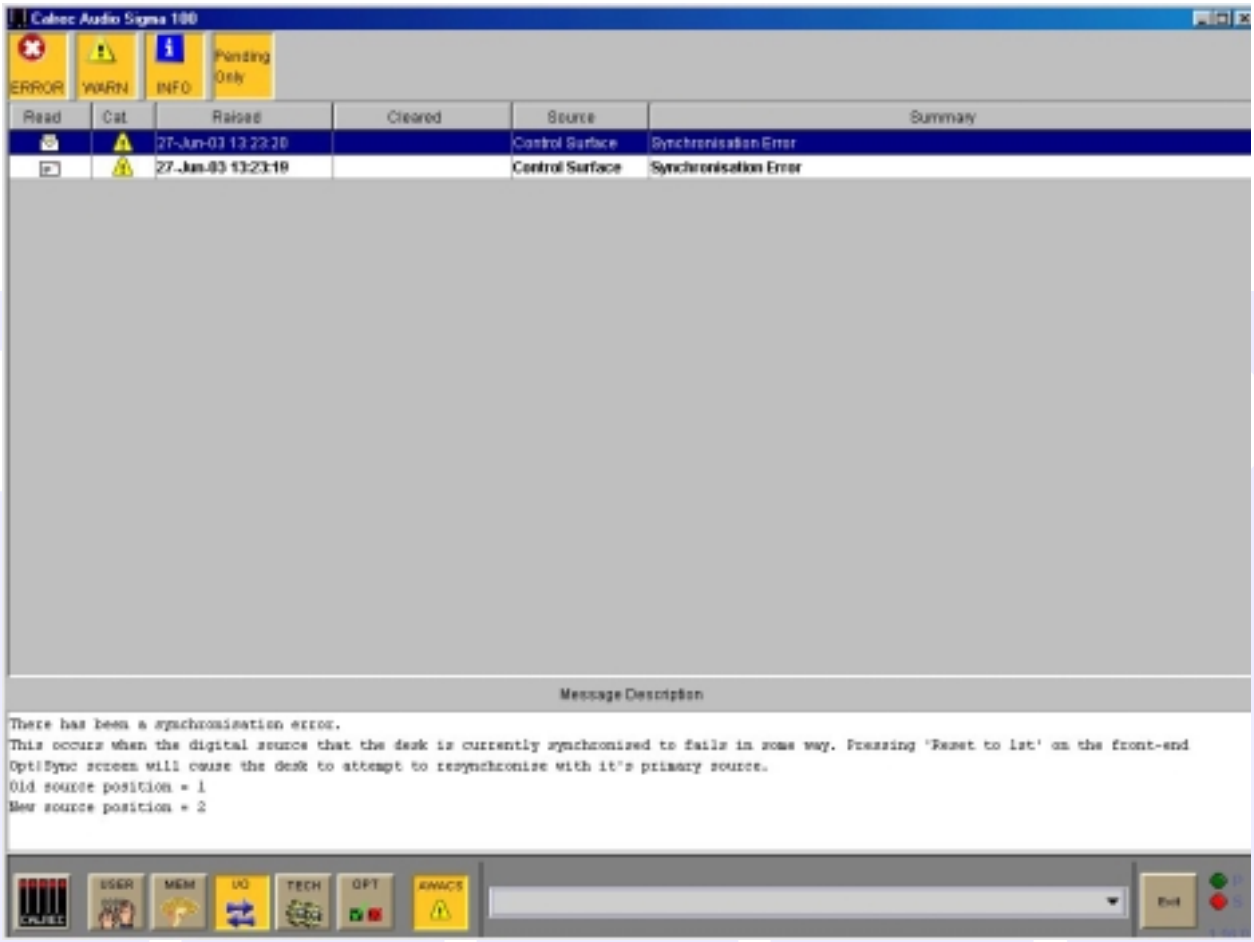
The Alpha 100 screens are divided into groups which are accessed using the buttons along the bottom of the display. There are groups for:

	Panels	Operational reproductions of the console panels for off-line work or in case of a panel failure.
	User	Operational screens which enhance the controls on the console and for setting options which are stored with the memories.
	Mem	Memory control screens to supplement the panel controls.
	I/O	Set up and display of all the I/O connections stored with the memories.
	Tech	Entry to and control of password-protected operational modes, trouble-shooting screens.
	Opt	Options screens for pre-set items which are not stored with the memories.

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

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

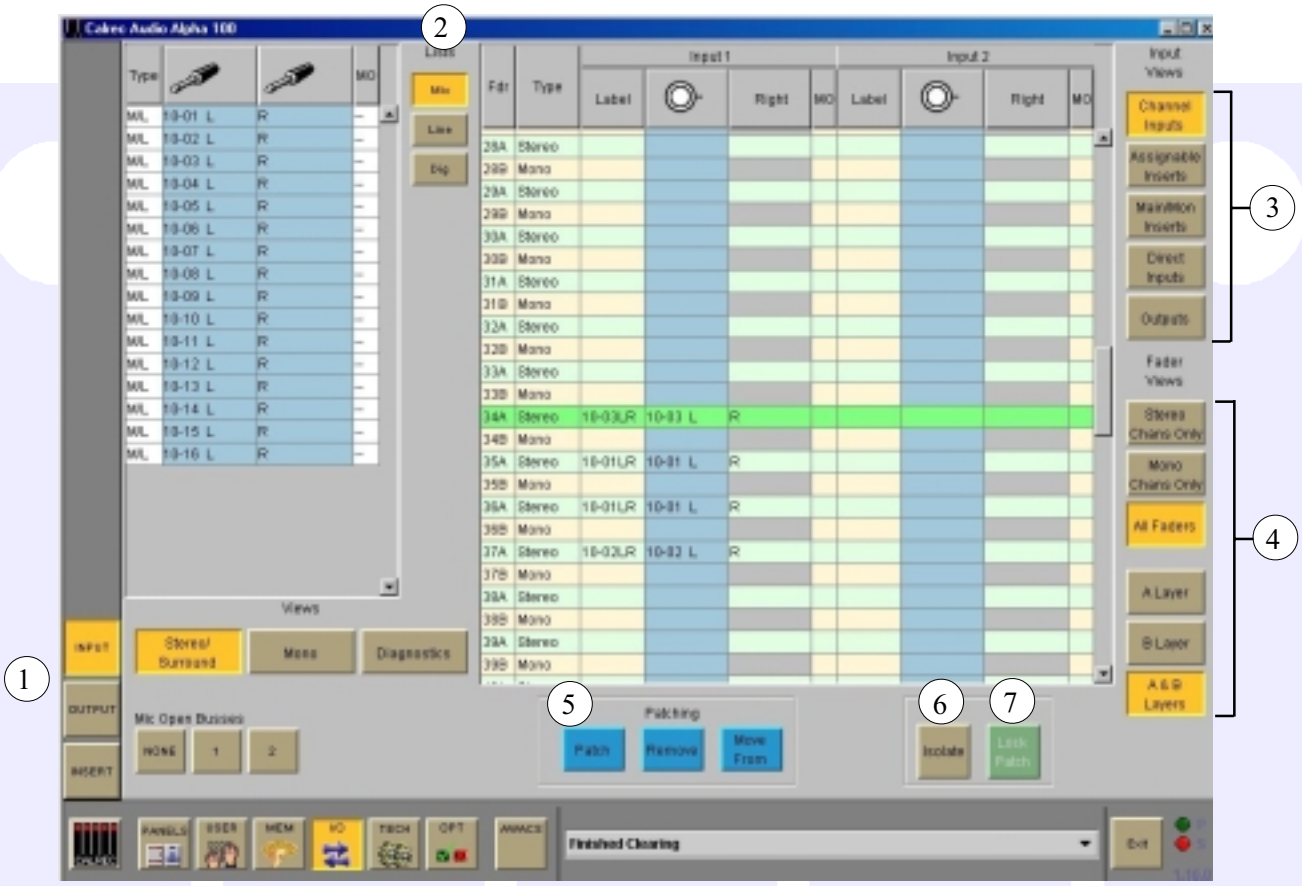
Fatal Error messages, where the system cannot recover by itself (perhaps because the back-up is already in use)

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.

INPUT/OUTPUT PORTS SCREENS

This screen allows:

- "Patching" of input sources to channel inputs, Insert Returns, Direct Inputs or Outputs
- "Patching" ofconsole output signals to Main, Auxiliary and Track output ports, Insert Sends and Direct Outputs
- "Patching" of Insert Sends and Returns to channels and groups



Ports are normally assigned using the I/O Matrix panel, but these screens provide an alternative set of controls, which can be useful if the control surface were to develop a fault. The screens automatically scroll to follow the Assign button (A and B) presses on the faders.

(1) Input, Output or Insert

These buttons select between three screens - Input Ports, Output Ports or Inserts.

(2)Source Lists

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

(2) Viewing Options

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

(3) Input Views

These buttons select the different console path types which can have input ports attached (Channel Inputs, Insert Returns, Direct Inputs or Outputs). They will then be displayed in the main section of this screen. Selecting a source from the source list and a channel, insert return or output, then selecting PATCH will assign that source to the channel.

(4) Fader Views

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

(5) Patching

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

Connections can also be made using the I/O Matrix panel, available as an option for those who would prefer a set of controls on the control surface.

The Input Source label will appear in the Channel Input NAME field and on the fader on the console (if that input, 1 or 2, is selected on the Input/Output panel). By selecting one of the name cells, 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.

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 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 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

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

(7) Locking

Certain elements of each desk configuration may need to be 'locked' once they have been set up to avoid accidental removal. For this reason, Calrec provides a system of software locks to protect critical parts of each configuration. The Alpha 100 can be in one of three modes, "User", "Technician" and "Supervisor". Operation of the locking system is only available in "Technician" or "Supervisor" mode, which are password protected to add an extra layer of security. Modes are selected using the TECH screen. If a lock is active, the port name will be highlighted in bright green text.

CHANNEL FUNCTIONS SCREEN

This screen provides alternative controls for channel functions already available on the control surface. It provides a back-up set of controls, which can be used should the control surface develop a fault.

(1) The right side of the screen shows the channels with buttons for paths A and B. To make changes, click on the required channel path and use the controls on the left side of the screen.

(2) The path type can be selected as Mono or Stereo, normally selected on the I/O Matrix panel.

(3) Routing to groups can be controlled from here in addition to the Routing panel.

(4) The ability to Move paths is available, found also on the I/O Matrix panel. Paths can also be cleared altogether.

(5) & (6)Wild Assignment and choice of information for display on the fader bargraphs are selectable from this screen in addition to the controls found on the Functions panel.

Assigning Wild Controls from the Channel Functions Screen.

The Wild controls are assigned from either the Functions Panel, or from the Channel Functions screen. All the Assign Panel rotary controls incorporate a switch which is operated by pushing the control. These switches are used to assign the control to a Wild control as follows:

1) Select a Fader Path by pressing its Assign Button (A or B).
2) Select WILD ASSIGN 1, 2, 3 or 4 on the Channel Functions screen.
3) Push one Assign Panel rotary control. For example, Aux 1 Send.

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

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. Clicking on the button above HOLD will toggle between SELECT mode and REGIONS mode.

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

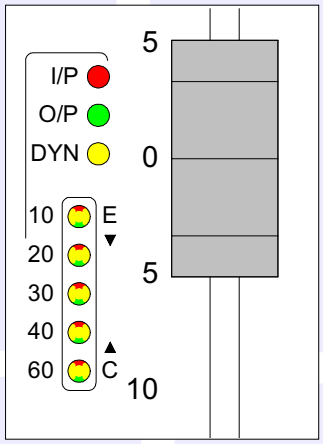
In REGIONS mode, a block or region of faders can be defined by clicking HOLD and then pressing the fader assign buttons of the first and last fader path in the required region. Pushing an Assign Panel rotary control will assign that control to all fader paths in the selected region.

It is possible to assign the same control to Wilds 1, 2, 3 or 4 for all fader paths by selecting ALL before pushing the required Assign Panel rotary control.

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

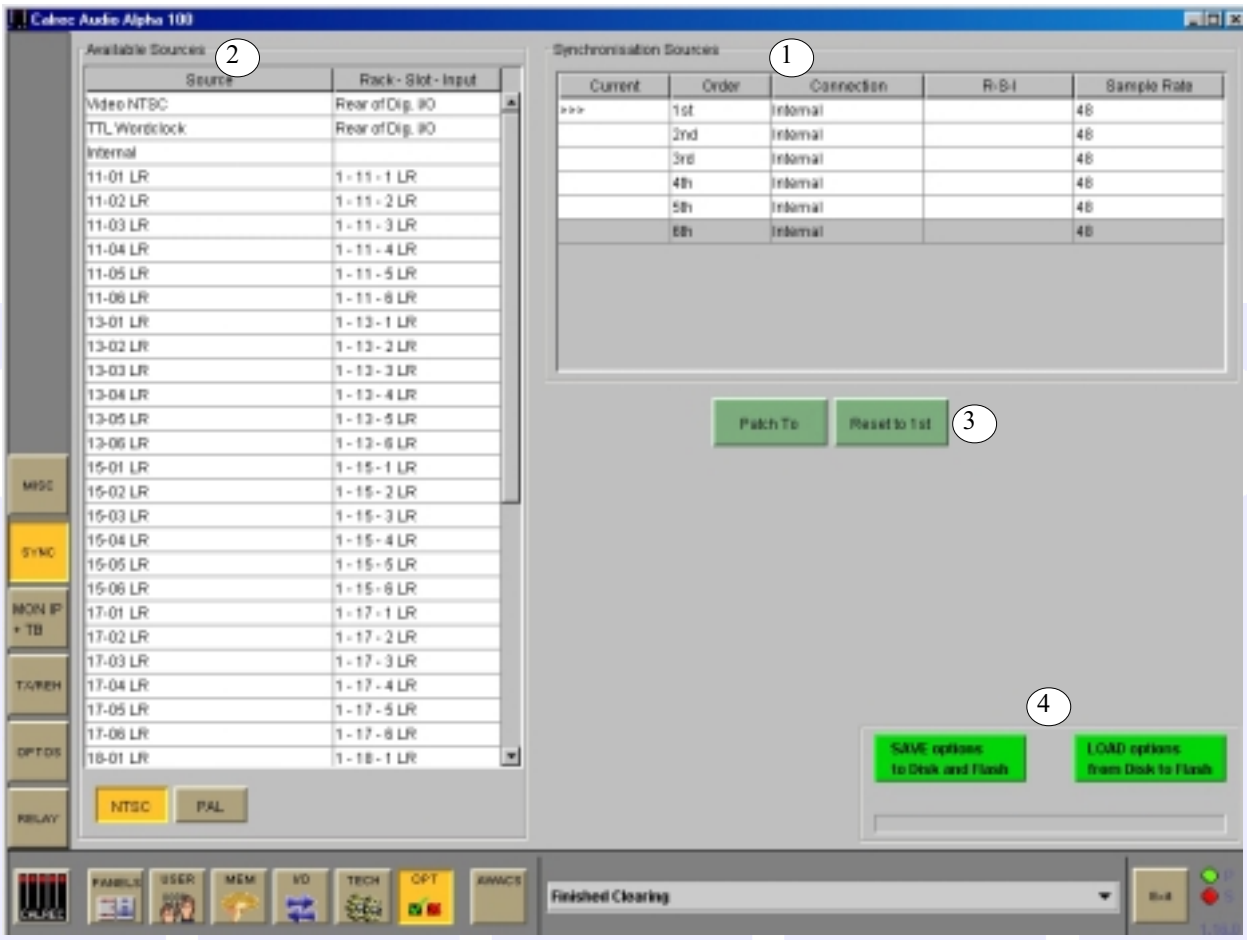
Fader Bargraph Assignment

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



Fader Bargraph assignment can also be altered using the Functions Panel

SYNCHRONISATION SCREEN



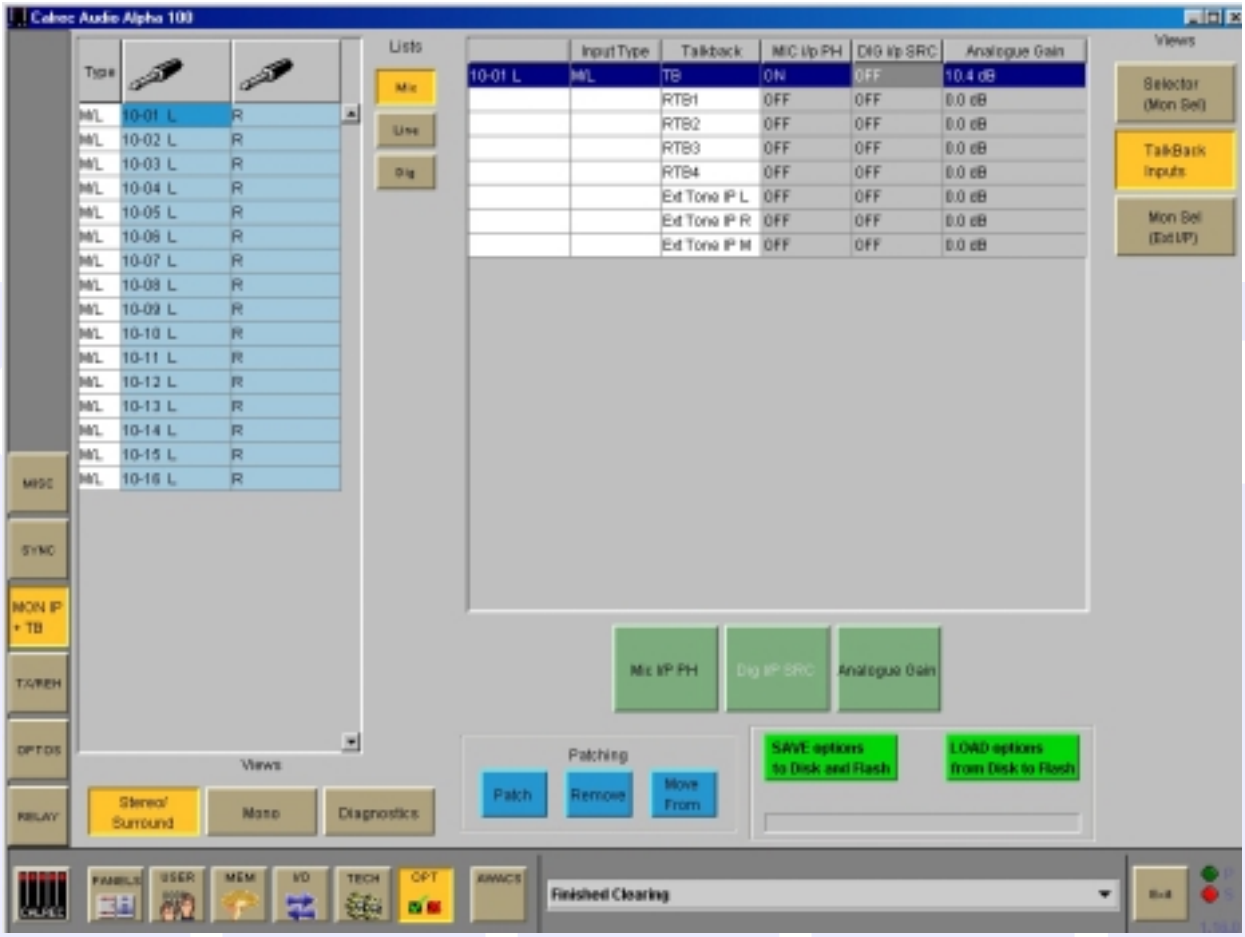
(1) The system can be pre-set with up to five external sync sources, plus internal, such that if the 1st source fails, it will automatically switch to the 2nd, and so on. One of the external sources can be Video, (PAL or NTSC). TTL wordclock is another possible external source.

(2) Digital 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. These can be patched to the five selections using the Patch button. 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.

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

(4) 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 separately using these buttons. This allows options to be changed without invalidating any saved memories.

MONITOR I/P & TB SCREEN - TALKBACK INPUT PORTS VIEW

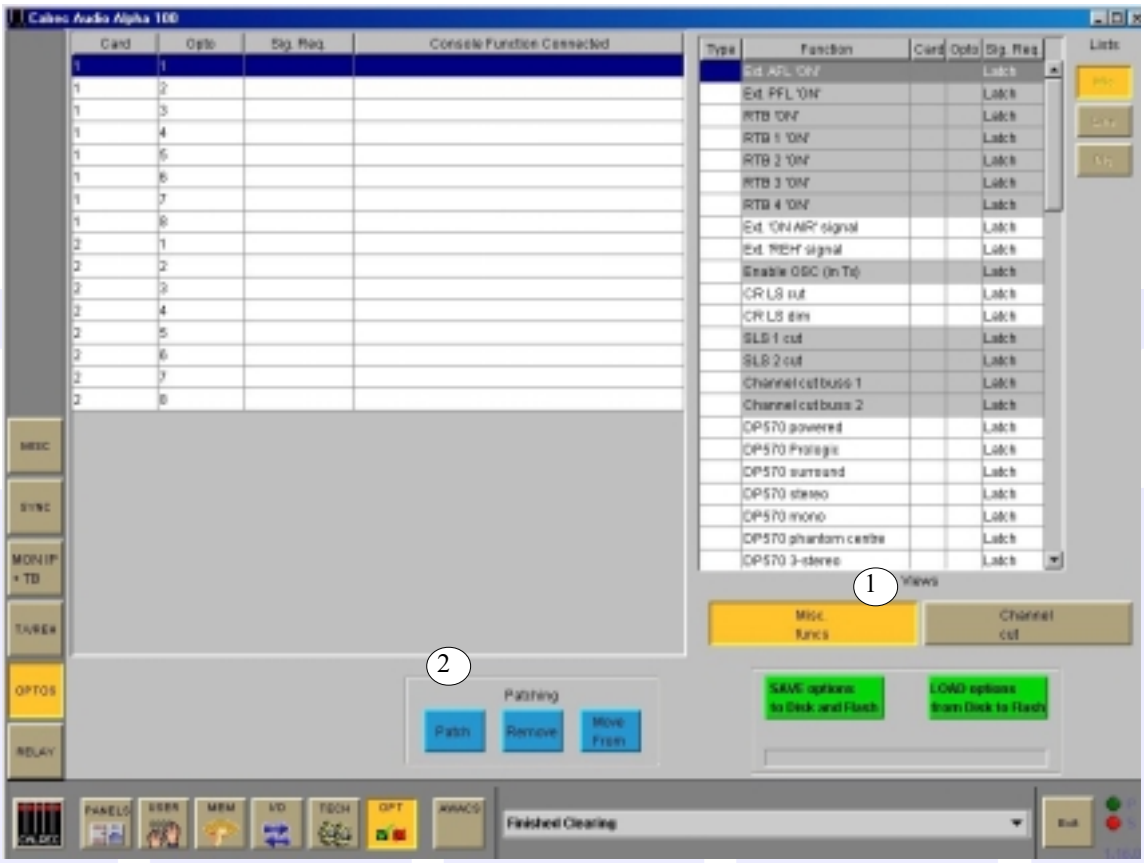


The Input Sources for Talkback and Reverse Talkback can be patched here in the same way that channel inputs are patched. Talkback input ports can be any kind of port.

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

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 separately to disk and Flash ROM using the green Save and Load buttons. This allows options to be changed without invalidating any saved memories.

OPTO SCREEN

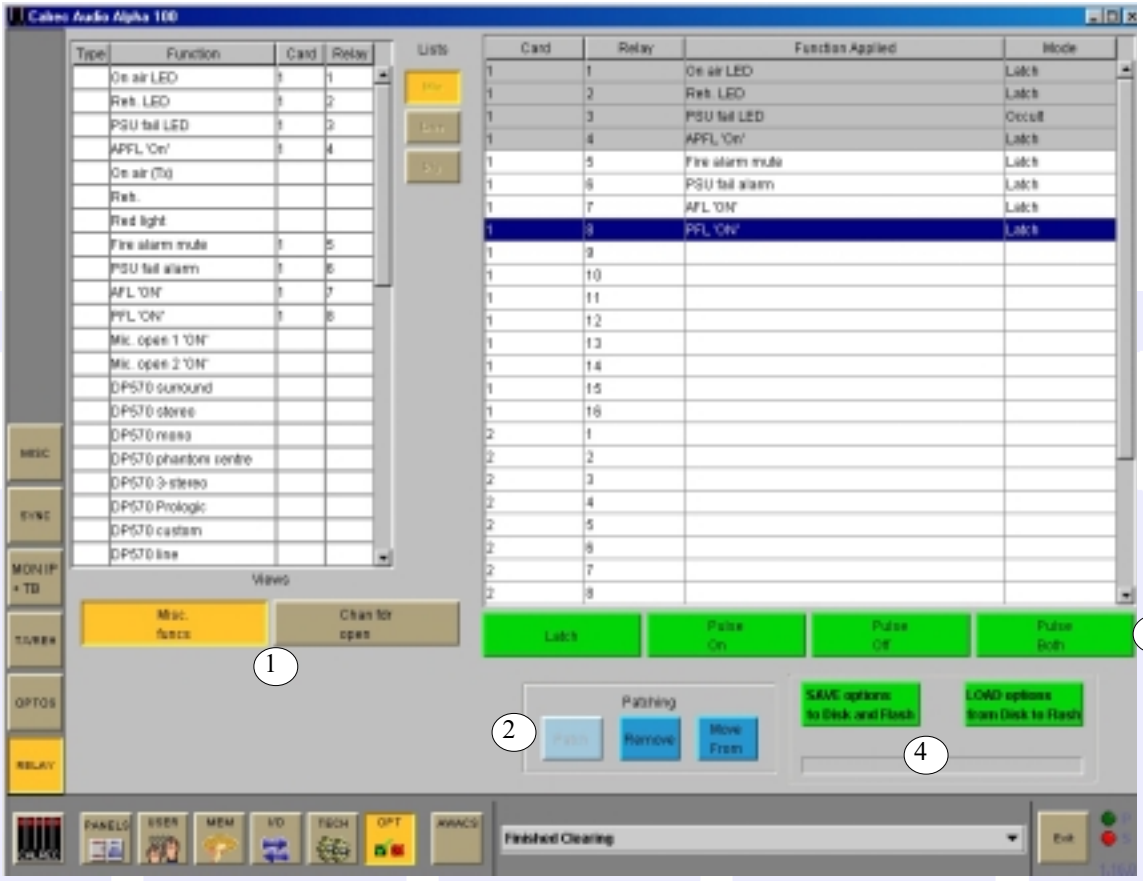


(1) The Opto-isolated Inputs can be assigned to various console functions (with 'Misc Functions' selected), or they can be set to cut channels (with 'Channel Cut' selected).

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

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

RELAY SCREEN



The Relay-isolated Output connections for various Console Functions can be assigned here in the same way that Opto-isolated Inputs are assigned.

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

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

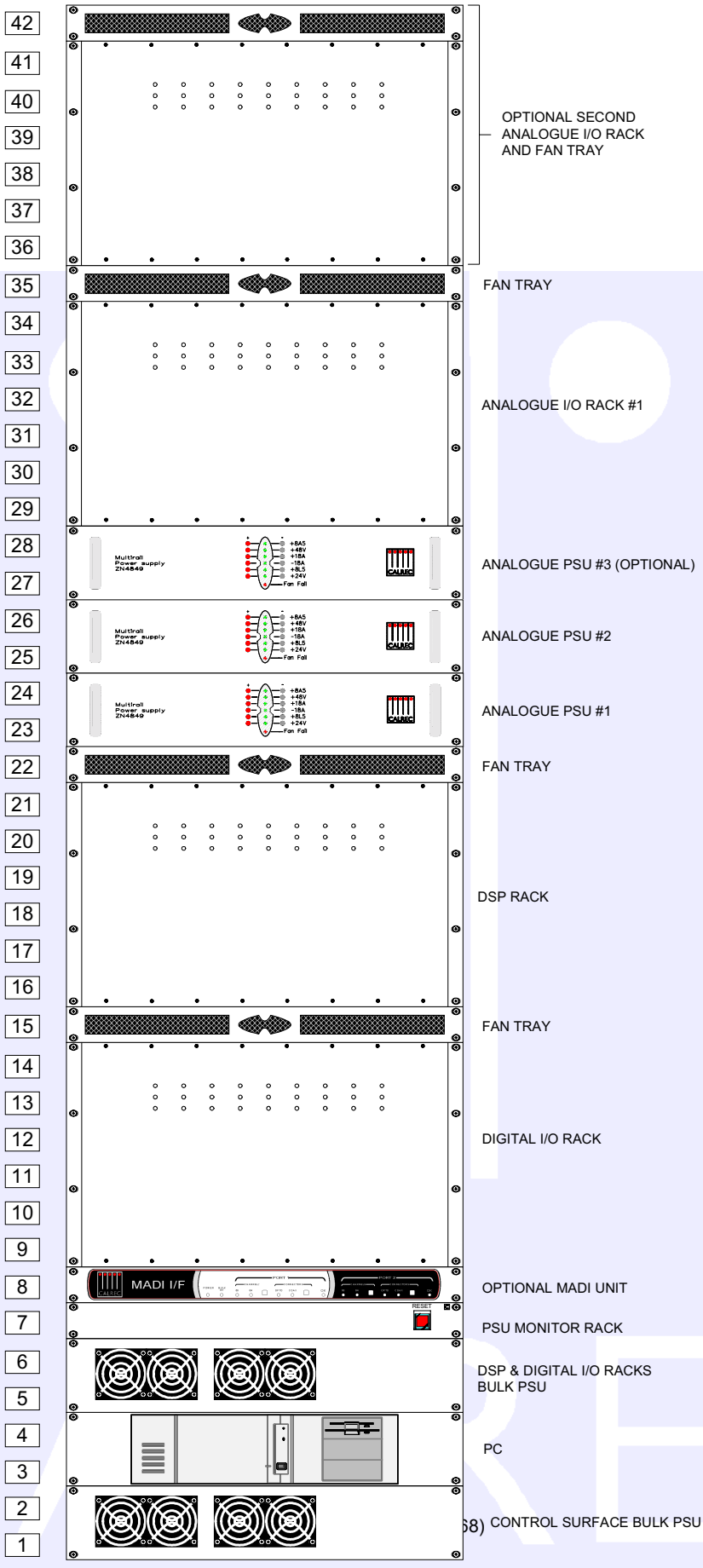
(3) The relay can be set to latch or pulse for 100 ms, when the Console Function is activated. When setting the relay to pulse, there are three different options.

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

(4) 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 separately to disk and Flash ROM using the green Save and Load buttons. This allows options to be changed without invalidating any saved memories.

Technical Information

TYPICAL RACK LAYOUT



RACK COOLING & SIZES

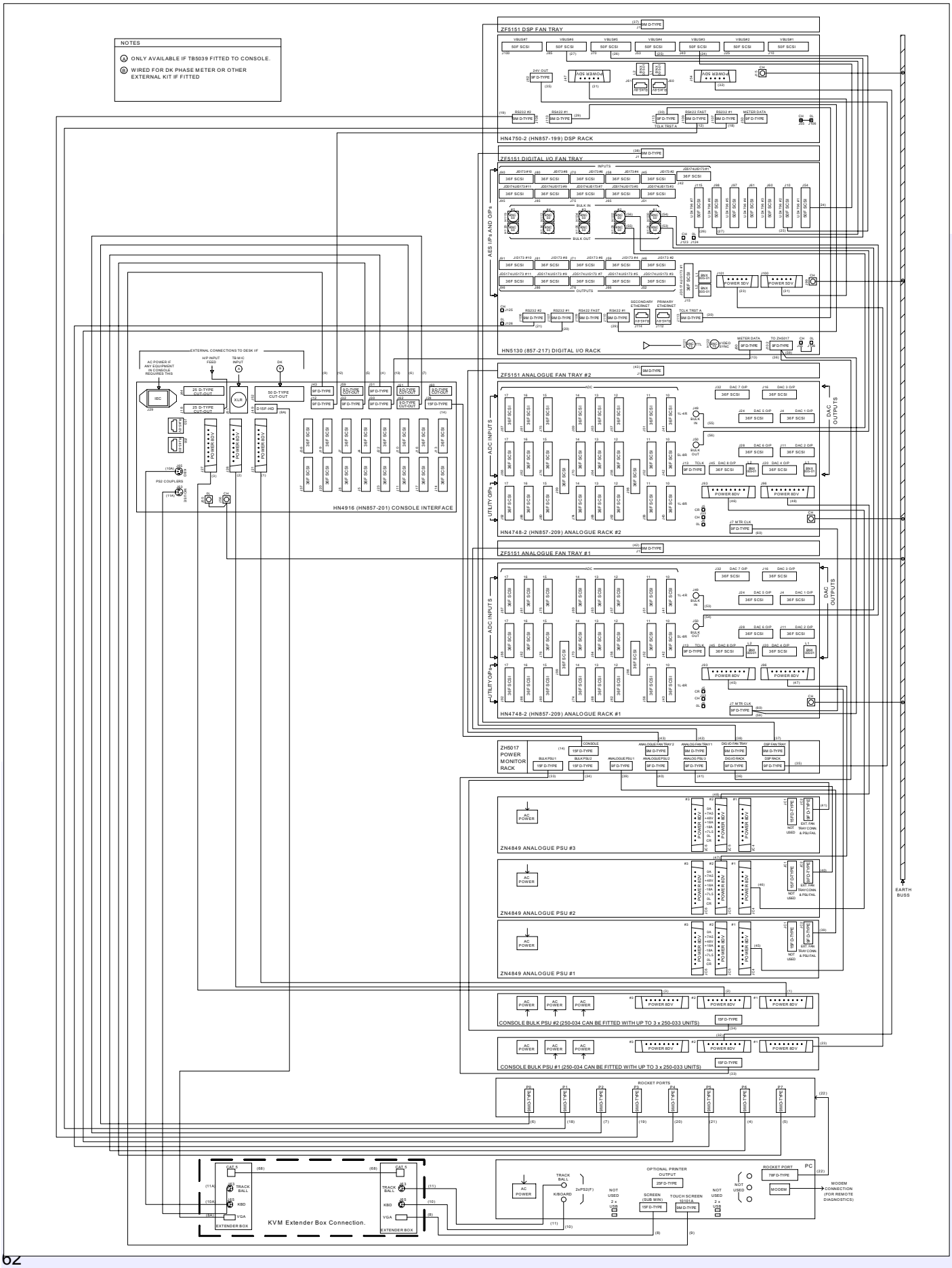
Each audio rack (DSP, Digital I/O, and Analogue) is supplied with a 1U low noise fan tray which should be positioned immediately above the rack. The fan tray incorporates a baffle such that warm air is sucked up out of the rack and out through the rear of the fan tray. A vent in the front of the fan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

Rack (incl cards)	Height	Approx depth (incl. mating cons)		Approx weight		Number of PSU's required (excl. hot spares)
		inches	mm	lbs	kgs	
DSP (with cards for an average size system)	6U	18.9	480	26.0	11.8	1
DSP (with cards for the largest system)	"	"	"	38.4	17.4	1
Digital I/O (with cards for an average system)	6U	18.1	460	29.8	13.5	Incl. in DSP
Digital I/O (with cards for the largest system)	"	"	"	42.6	19.3	Incl. in DSP
Analogue I/O (1/2 full)	6U	18.1	460	26.0	11.8	1 x Analogue
Analogue I/O (full)	"	"	"	35.7	16.2	1 x Analogue

Other Items	Height	Approx depth (incl. mating cons)		Approx weight		Approx Power Output (W) (full load)	Approx AC Power (VA) (full load)
		inches	mm	lbs	kgs		
Bulk PSU rack * with one PSU	2U	18.5	470	17.4	7.9	1000	1250
Extra PSU for Bulk rack	-	-	-	7.3	3.3	1000	1250
Analogue racks PSU *	2U	18.1	460	22.1	10.0	460	660
Power for Hot spare (any type)	-	-	-	-	-	No extra	Less than 5% extra
Fan Tray	1U	19.7	500	6.6	3.0	-	-
PSU Monitor box	1U	6.7	170	4.4	2.0	-	-
PC	2U	16.9	430	23.4	10.6	-	400

* Note: PSU's have handles protruding approx. 1.3" (32mm) from the surface of the front panel.

TYPICAL CONSOLE & RACK WIRING INFORMATION



CABLE No	CABLE TYPE	FROM	CONNECTOR	CONN TYPE	TO	CONNECTOR	CONN TYPE	CIRCUIT	NOTE
1	8C2.5 (310-372)	Bulk PSU 2	1	8way D (M)	HN4916	J21	8way D (F)	Console DC pwr 1	CONSOLE
2	8C2.5 (310-372)	Bulk PSU 2	2	8way D (M)	HN4916	J26	8way D (F)	Console DC pwr 2	CONSOLE
3	8C2.5 (310-372)	Bulk PSU 2	3	8way D (M)	HN4916	J27	8way D (F)	Console DC pwr 3	CONSOLE
4	BEL5 8135 (310-377)	PC	PORT #6	9way D (F)	HN4916	J31	9way D(M)	Console RS232-1	CONSOLE
5	BEL5 8135 (310-377)	PC	PORT #7	9way D (F)	HN4916	J32	9way D(M)	Console RS232-2	CONSOLE
6	BEL5 8135 (310-377)	PC	PORT #0	9way D (F)	HN4916	J61	9way D(M)	Console debug 1	CONSOLE
7	BEL5 8135 (310-377)	PC	PORT #2	9way D (F)	HN4916	J62	9way D(M)	Console debug 2	CONSOLE
8	(491-020/1) VGA	PC	SCREEN	15way HD D (M)	HN4916	J49	15way HD D (M)	Console screen	CONSOLE
9	BEL5 9505 (310-379)	PC	10101A	9way D (F)	HN4916	J43	9way D(M)	C.Touch Screen	CONSOLE
10	(491-022/3) PS2	PC	KBD	PS2	HN4916	J65	PS2	Console keyboard	CONSOLE
11	(491-022/3) PS2	PC	MOUSE	PS2	HN4916	J63	PS2	Console trackball	CONSOLE
12	BEL5 9505 (310-379)	HN4750	J109	9way D (F)	HN4916	J12	9way D(M)	C.RS422 FAST	CONSOLE
13	BEL5 9505 (310-379)	HN5130	J50	9way D(M)	HN4916	J30	9way D(M)	C.Meter Data	CONSOLE
14	DMP10 (310-366)	ZH5017	CONSOLE	15way D (M)	HN4916	J28	15way D (M)	Console PSU fail	CONSOLE
15	PSF4/1 (310-140)	HN4748	???	SCSI36	HN4916	J51	XLR 3 (F)	C.TB mic out	CONSOLE
16	BEL5 9505 (310-379)	HN4748	???	SCSI36	HN4916	J18	25way D (M)	Console H/P in	CONSOLE
17	DMP10 (310-366)	HN4748/5130	???	SCSI36	HN4916	J52	50way D (M)	C.Phase Mtr In	CONSOLE
18	BEL5 8135 (310-377)	HN4750	J107	9way D (F)	PC	PORT #1	9way D (F)	DSP RS232-1	PC
19	BEL5 8135 (310-377)	HN4750	J108	9way D (F)	PC	PORT #3	9way D (F)	DSP RS232-2	PC
20	BEL5 8135 (310-377)	HN5130	J107	9way D (F)	PC	PORT #4	9way D (F)	Dig I/O RS232-1	PC
21	BEL5 8135 (310-377)	HN5130	J108	9way D (F)	PC	PORT #5	9way D (F)	Dig I/O RS232-2	PC
22	Supplied	Bay PC	PORTS 1-8	8x9way D(M)	PC	Rocket Port	78way HD D (F)	Rocket Port Lead	PC
23	4C2.5 (310-371)	Bulk PSU 1	1	8way D (M)	HN5130	J101	5way D (F)	Digi rack supply 1	Dig I/O
24	(312-075) SCSI50-1m	HN4750	J40	SCSI50	HN5130	J54	SCSI50	V BUSS Link 1	Dig I/O
25	(312-075) SCSI50-1m	HN4750	J53	SCSI50	HN5130	J10	SCSI50	V BUSS Link 2	Dig I/O
26	(312-075) SCSI50-1m	HN4750	J70	SCSI50	HN5130	J115	SCSI50	V BUSS Link 3	Dig I/O
27	(312-075) SCSI50-1m	HN4750	J85	SCSI50	HN5130	J98	SCSI50	V BUSS Link 4	Dig I/O
28 **	(312-075) SCSI50-1m	HN4750	J25	SCSI50	HN5130	J61	SCSI50	V BUSS Link 5	Dig I/O
29	BEL5 9505 (310-379)	HN5130	J110	9way D (F)	HN4750	J110	9way D (F)	RS 422 -1	DSP
30	BEL5 9505 (310-379)	HN5130	J113	9way D(M)	HN4750	J113	9way D(M)	TCLK	DSP
31	4C2.5 (310-371)	HN5130	J100	5way D (F)	HN4750	J47	5way D (F)	Racks DC pwr link	DSP
32	4C2.5 (310-371)	Bulk PSU 1	2	8way D (M)	HN4750	J54	5way D (F)	DSP DC pwr	DSP
33	BEL5 9505 (310-379)	Bulk PSU 1	D1	15way D(M)	ZH5017	BULK PSU 1	15way D(M)	Racks PSU mon	Pwr Mon
34	BEL5 9505 (310-379)	Bulk PSU 2	D1	15way D(M)	ZH5017	BULK PSU 2	15way D(M)	Console PSU mon	Pwr Mon
35	BEL2 9502 (310-380)	HN4750	J62	9way D(M)	ZH5017	DSP RACK	9way D(M)	DSP fan pwr	Pwr Mon
36	BEL2 9502 (310-380)	HN5130	J102	9way D(M)	ZH5017	DIG RACK	9way D(M)	Dig I/O fan pwr	Pwr Mon
37	BEL2 9502 (310-380)	ZF5131-DSP	D1	9way D (F)	ZH5017	DSP FAN	9way D (F)	DSP fan fail ind	Pwr Mon
38	BEL2 9502 (310-380)	ZF5151-I/O	D1	9way D (F)	ZH5017	DIG FAN	9way D (F)	Dig I/O fan pwr/fail mon	Pwr Mon
39 *	BEL2 9502 (310-380)	ZN4849-No.1	EXT FAN	9way D(M)	ZH5017	ANALOGUE PSU 1	9way D(M)	A1 fan pwr / PSU fail	Pwr Mon
40 *	BEL2 9502 (310-380)	ZN4849-No.2	EXT FAN	9way D(M)	ZH5017	ANALOGUE PSU 2	9way D(M)	A2 fan pwr / PSU fail	Pwr Mon
41 *	BEL2 9502 (310-380)	ZN4849-No.3	EXT FAN	9way D(M)	ZH5017	ANALOGUE PSU 3	9way D(M)	A3 fan pwr / PSU fail	Pwr Mon
42 *	BEL2 9502 (310-380)	ZF5151-An1	D1	9way D (F)	ZH5017	ANALOGUE FAN 1	9way D (F)	A1 fan pwr / fail ind	Pwr Mon
43 *	BEL2 9502 (310-380)	ZF5151-An2	D1	9way D (F)	ZH5017	ANALOGUE FAN 2	9way D (F)	A2 fan pwr / fail ind	Pwr Mon
44 *	BEL2 9502 (310-380)	ZF5151-An3	D1	9way D (F)	ZF5151-An2	D1	9way D (F)	A3 fan pwr / fail ind	Pwr Mon
45 *	8C1.5 (310-373)	ZN4849-No.1	O/P 1	8way D (M)	HN4748-No.1	J93	8way D (F)	Analogue PSU 1/1	Analogue Rack 1
46 *	8C1.5 (310-373)	ZN4849-No.2	O/P 1	8way D (M)	HN4748-No.2	J93	8way D (F)	Analogue PSU 2/1	Analogue Rack 2
47 *	8C1.5 (310-373)	ZN4849-No.2	O/P 2	8way D (M)	HN4748-No.1	J96	8way D (F)	Analogue PSU 2/2	Analogue Rack 1
48 *	8C1.5 (310-373)	ZN4849-No.3	O/P 2	8way D (M)	HN4748-No.2	J96	8way D (F)	Analogue PSU 3/2	Analogue Rack 2
49 *	8C1.5 (310-373)	ZN4849-No.3	O/P 1	8way D (M)	HN4748-No.3	J93	8way D (F)	Analogue PSU 3/1	Analogue Rack 3
50 *	8C1.5 (310-373)	ZN4849-No.1	O/P 2	8way D (M)	HN4748-No.3	J96	8way D (F)	Analogue PSU 1/2	Analogue Rack 3
51 *	8C1.5 (310-373)	ZN4849-No.1	O/P 2	8way D (M)	HN4748-No.2	J96	8way D (M)	Analogue PSU 1/2	Analogue Rack 2
52 *	8C1.5 (310-373)	ZN4849-No.1	O/P 2	8way D (M)	HN4748-No.1	J96	8way D (F)	Analogue PSU 1/2	Analogue Rack 1
53 *	(312-083) SMB50-1m	HN5130	H101	SMB	HN4748-No.1	J49	SMB	Bulk Link in 1	Analogue Rack 1
54 *	(312-083) SMB50-1m	HN5130	H100	SMB	HN4748-No.1	J50	SMB	Bulk Link out 1	Analogue Rack 1
55 *	COAX 50 Ohm (310-374)	HN5130	H103	SMB 50 (P)	HN4748-No.2	J49	SMB 50 (P)	Bulk Link in 2	Analogue Rack 2
56 *	COAX 50 Ohm (310-374)	HN5130	H102	SMB 50 (P)	HN4748-No.2	J50	SMB 50 (P)	Bulk Link out 2	Analogue Rack 2
57 *	COAX 50 Ohm (310-374)	HN5130	H105	SMB 50 (P)	HN4748-No.3	J49	SMB 50 (P)	Bulk Link in 3	Analogue Rack 3
58 *	COAX 50 Ohm (310-374)	HN5130	H104	SMB 50 (P)	HN4748-No.3	J50	SMB 50 (P)	Bulk Link out 3	Analogue Rack 3
59 *	BEL2 9502 (310-380)	HN5130	J102	9way D(M)	HN4748-No.1	J7	9way D(M)	Analogue Reset 1	Analogue Rack 1
60 *	BEL2 9502 (310-380)	HN4748 - 1	J7	9way D(M)	HN4748-No.2	J7	9way D(M)	Analogue Reset 2	Analogue Rack 2
61 *	BEL2 9502 (310-380)	HN4748 - 2	J7	9way D(M)	HN4748-No.3	J7	9way D(M)	Analogue Reset 3	Analogue Rack 3
62 *	BEL2 9502 (310-380)	ZF5151-An1	D1	9way D (F)	ZN4849-No.1	EXT FAN	9way D(M)	Analogue Fan 1	Analogue Fan 1
63 *	BEL2 9502 (310-380)	ZF5151-An2	D1	9way D (F)	ZN4849-No.2	EXT FAN	9way D(M)	Analogue Fan 2	Analogue Fan 2
64 *	BEL2 9502 (310-380)	ZF5151-An3	D1	9way D (F)	ZN4849-No.3	EXT FAN	9way D(M)	Analogue Fan 3	Analogue Fan 3
65 *	BEL2 9502 (310-380)	ZN4849-1	EXT FAN	9way D(M)	ZH5017	ANALOGUE PSU 1	9way D(M)	A1 fan pwr / PSU fail	Pwr Mon
66 *	BEL2 9502 (310-380)	ZN4849-2	EXT FAN	9way D(M)	ZH5017	ANALOGUE PSU 2	9way D(M)	A2 fan pwr / PSU fail	Pwr Mon
67 *	BEL2 9502 (310-380)	ZN4849-3	EXT FAN	9way D(M)	ZH5017	ANALOGUE PSU 3	9way D(M)	A3 fan pwr / PSU fail	Pwr Mon
68									
69									
70	GRN/YEL 6 (310-333)	Eqpt Bay			Console			System Earth	CONSOLE

* Note: (regarding cables 39 - 67)
on 3 analogue rack / 3 PSU systems fit cable nos 45 - 50, 53 - 67
on 2 analogue rack / 3 PSU systems fit cable nos 39 - 43, 45 - 48, 53 - 56, 59, 60
on 2 analogue rack / 2 PSU systems fit cable nos 39, 40, 42, 43, 45 - 47, 51, 53 - 56, 59 & 60
on 1 analogue rack / 2 PSU systems fit cable nos 39, 40, 42, 45,47, 53, 54 & 59
on 1 analogue rack / 1 PSU systems fit psu cable nos 39, 42, 45, 52 - 54 & 59

** Note: (regarding cable 28)
This is only fitted when the system is equipped with a large number of Inputs

MAXIMUM CABLE LENGTHS

The table below shows the maximum cable lengths permitted within the system.

Cables from	To	Maximum length	
		feet	metres
Control surface	Control Surface Bulk PSU's	100.0	30.0
Control surface	PC	500.0	150.0
Control surface *	DSP & Digital I/O racks*	100.0	30.0
PC	DSP & Digital I/O racks	100.0	30.0
DSP rack	Digital I/O rack	1.3	0.4
DSP &Digital I/O racks	Racks Bulk PSU's	100.0	30.0
Digital I/O rack	Analogue rack	33.0	10.0
Analogue I/O rack	Analogue I/O rack PSU	33.0	10.0
Analogue I/O rack PSU	Link between PSU's	1.3	0.4
MADI Unit	Digital I/O rack	16.5	5

* Optional extenders can be used to provide console data connections up to 150 metres (500 feet).

ENVIRONMENTAL CONSIDERATIONS

Temperature range:
Operating 0ºC to +30ºC, in the immediate environment
Non-operating -20ºC to +60ºC.

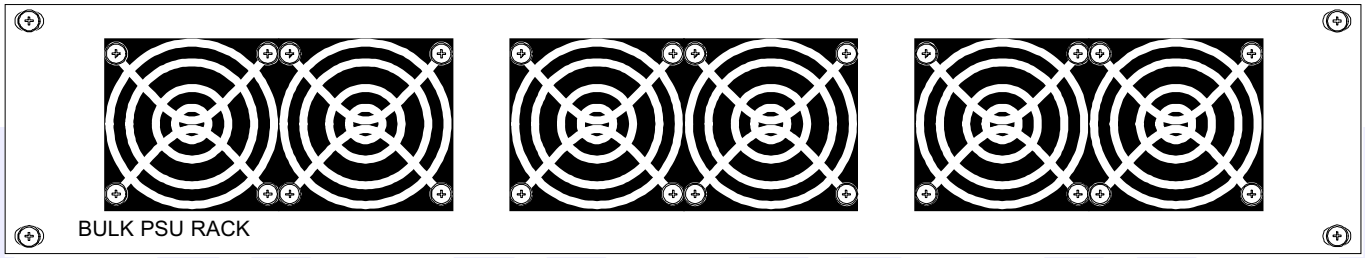
Relative humidity:
Operating 25% to 80% non condensing.
Non-operating 0% to 90% non condensing.

Altitude:
Operating: Up to 2,000 metres (6500ft). (This is the limit to which the safety tests are valid).
Non-operating: Up to 15,000 metres (49,000ft).

POWER SUPPLIES

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

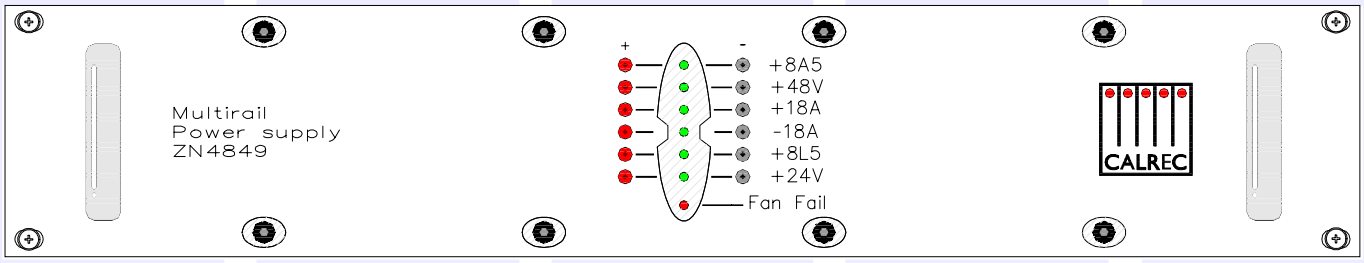
Bulk PSU (Powers Control Surface & DSP/Digital I-O Rack)



The Bulk PSU Rack is a 2U rack which can hold up to three identical plug-in PSU's. The rack has separate AC power inputs and DC outputs for each of the three PSU's. Any one PSU can be removed from the rack without disturbing the operation of the others in the rack. The rack is fan cooled with fans mounted in the front of each PSU. The warm air is directed out of the rear of the rack.
The DSP Rack & Digital I/O Rack are powered as one unit from one of these 2U racks. One PSU in this rack is sufficient for all system sizes. An optional second PSU in the rack, can act as a hot spare. The Control Surface is separately powered from another of these 2U racks. Depending on the Control Surface size, one or two PSU's are required. An optional second or third PSU in the rack, can act as a hot spare. The Control Surface hot spare cannot be the hot spare for the racks as well.

nstructions on how to install the Bulk PSU can be found on the next page.

Multi-Rail PSU (Powers Analogue Racks)



Analogue racks use a different 2U Multi-Rail PSU. The number of PSU's required will depend on the type of installation. Generally, one PSU is required for one analogue rack, and two for two or three fully populated analogue racks. An additional Multi-Rail PSU can serve as the hot spare for several racks, but only if they are housed together. If the Racks are housed in different locations, each may require a hot spare, depending upon the cable lengths involved. The Analogue racks PSU is also fan cooled but uses a very low noise fan, drawing air from side to side through the PSU instead of in from the front, to further minimise noise. Noise measurements for the fans can be found in the section entitled "Technical Specification". The Analogue PSU's are fitted with rear flanges. These allow the rear of the PSU to be bolted to the studio equipment bay.

All hot spare PSU's are optional.

TECHNICAL SPECIFICATION

DIGITAL INPUTS

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

DIGITAL OUTPUTS

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

ANALOGUE INPUTS

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

ANALOGUE OUTPUTS

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

PERFORMANCE

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

SYNCHRONISATION

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

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

SYSTEM FAN NOISE (dB SPL A-WEIGHTED)

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

Bulk PSU Rack	24V 1kW PSU	49dBA
	24V 1kW PSU (x2)	52dBA
	24V 1kW PSU (x4)	55dBA
Multi Rail PSU for Analogue Rack		29dBA

NOTES

(926-041 Iss.12)