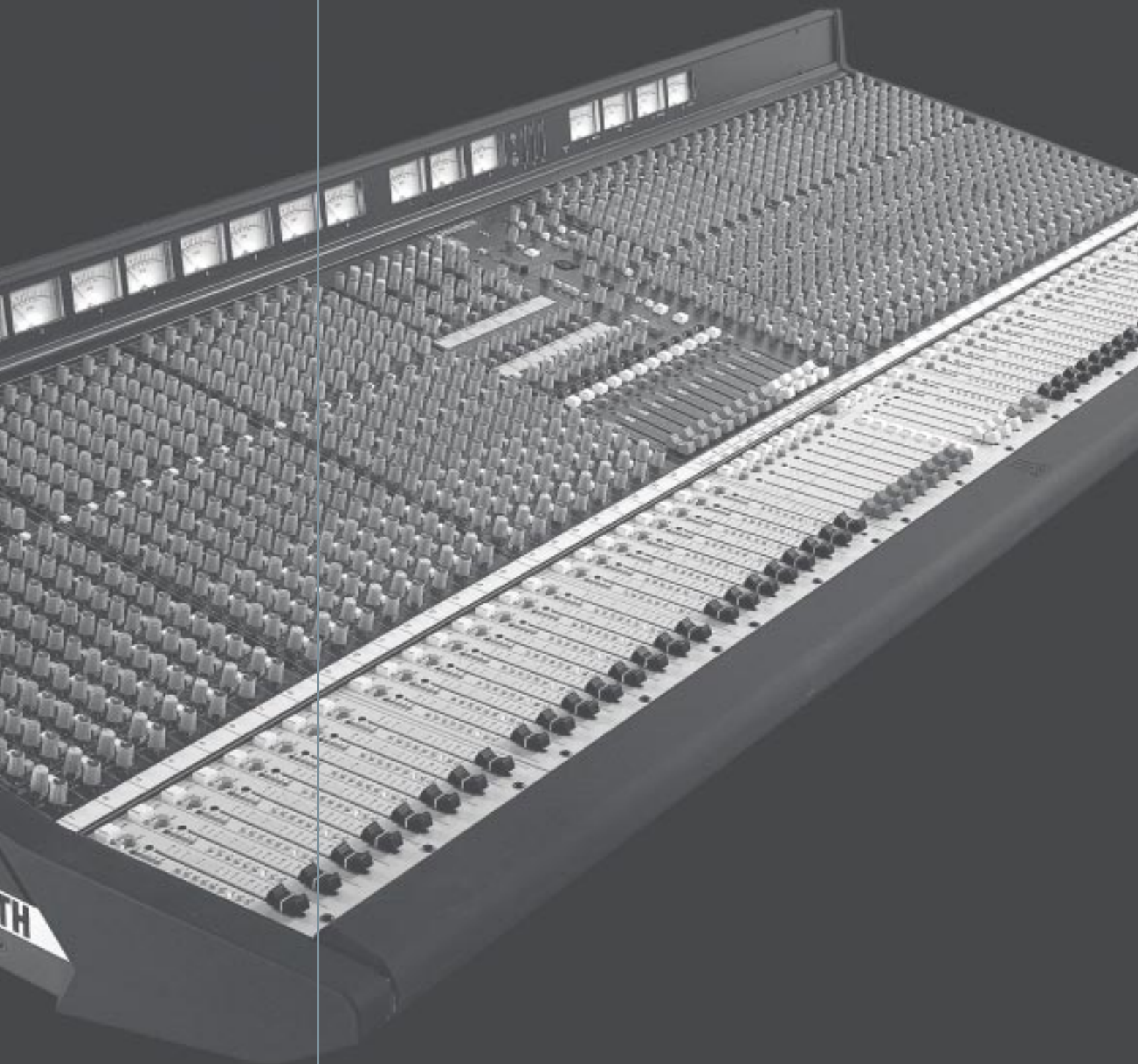


ML 4000

ALLEN&HEATH



↳ **ML4000**^[01]

foh/monitor live mixing console

↳



The **ML4000** from **ALLEN&HEATH**. The ideal all-purpose solution for install, PA hire and touring applications.

Taking the medium sized live console further up the evolutionary ladder, a robust, highly engineered and stylish package encompasses VCA groups, LCRplus blend/panning, 8 audio groups, 12 aux sends and FOH/monitor dual functionality.

ML4000 easily caters for the latest trends in live sound engineering with stereo in-ear monitoring, LCR systems, show automation plus a high quality preamp offers a clean, clear sound.

↳ **Evolution has never been so smart.**

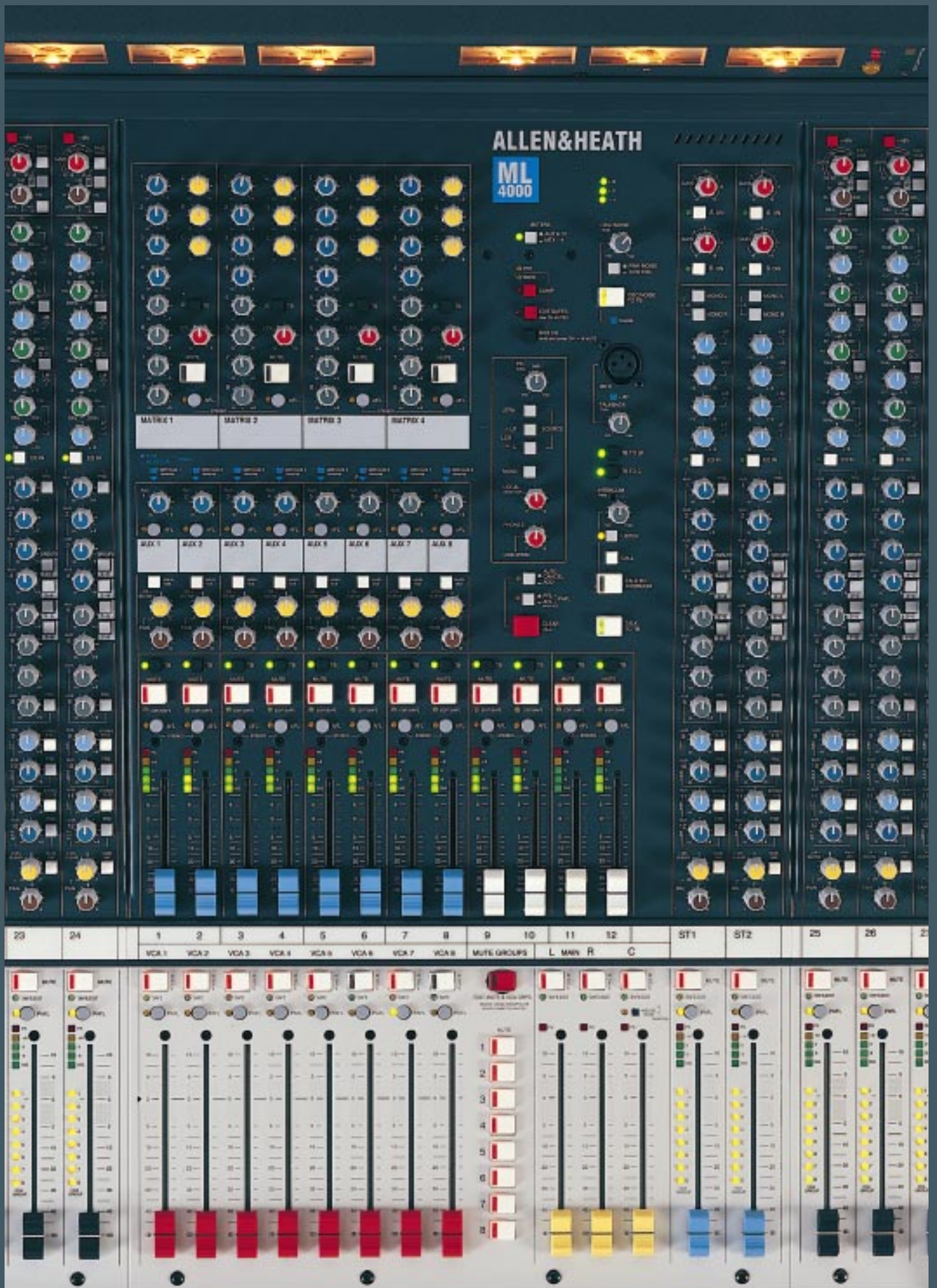
↳

- _ Dual function FOH or monitor
- _ 8 VCA Groups
- _ 8 Mute Groups
- _ Flexible 8 Group 12 Aux architecture
- _ 2 configurable Stereo Auxes
- _ 32, 40 or 48 mono mic/line input frames
- _ 2 dual stereo channels with A/B inputs and 4 band EQ
- _ LCRplus panning
- _ Engineers Wedge Monitor facility
- _ 11x4 Matrix

↳

- _ 4 band sweep EQ with switched Q
- _ New Mic Pre with sweepable filter
- _ MIDI interface for show control
- _ Intelligent P/AFL system
- _ Extensive monitoring and metering
- _ Assignable Talkback to all main outputs
- _ Built-in Intercom
- _ Oscillator and Pink Noise Generator
- _ Stand alone Sidecar Expander
- _ New generation Power Supply with built-in combiner

↳ Master Section [02]



↳ VCA Groups ^[03]

VCA's (Voltage Controlled Amplifiers) provide an important alternative to audio subgroups for simultaneously controlling the level of more than one channel using a single fader.

A VCA group controls the fader levels of assigned channels using a remote voltage from the group fader. Because audio is not routed through the group, all post fade outputs from assigned channels will be affected by the VCA master faders.

This means that the balance between the effects and direct signals is maintained. For example, the reverb level returned elsewhere in the console will also follow the group fader movements and a stereo or LCR group can be controlled using a single fader rather than the 2 or 3 that would be required if audio groups were used to retain the channel pan image.

Additionally, channels can be assigned to more than one VCA group at the same time, allowing multi-level groups, or even a 'grand master' - impossible with audio groups alone.

Conventional audio groups are still useful when you need to insert a signal processor to affect a group of signals. Fewer such groups are required on a VCA equipped console. For this reason, the ML4000 provides both types of grouping with no compromise.



↳fig.03

↳ LCRplus ^[04]

The ML4000 LCRplus system extends signal imaging beyond conventional LR and LCR panning by allowing full 3 speaker balance and positioning from each channel and group. This easily satisfies the standard requirements of mono, stereo and conventional LCR speaker systems, as well as providing a unique extended capability.

For example, a backing instrument such as a guitar typically routed to the LR speakers can be brought up in the centre speakers for the duration of a lead solo to improve focus and clarity.

Alternatively, in non-ideal situations where the three speakers do not reach all of the audience evenly, a small portion of centre cluster lead sounds such as vocals can be blended into the LR stacks to improve coverage. Or, use the C output to feed a centre fill speaker with selected sounds, for example stage mics without the front 'float' mics that would otherwise feed back if routed to the nearby fill.

All this is made possible using just two controls and a single switch:

↳**MAIN MIX**. This switch routes the audio to the 3 buss main output. The balance between the outputs is determined by:

↳**BLEND**. This adjusts the balance between the LR and C outputs.

↳**PAN**. Provides conventional panning between L and R. The level of signal made available to LR is set using the blend control.



↳fig.04

↳ Front of House

- Provides 8 audio groups and 12 auxes
- Fader controlled auxes 9-12 can be configured as mono or up to 2 stereo pairs, ideal for monitors from FoH, more effects, recording or other special feeds.
- 3 buss main output with LCRplus panning, allowing mono, stereo or true LCR system capability.
- 4 Matrix outputs derived from groups 1-8, and the main L R & C outputs for multi speaker control, recording and other special feeds.
- 8 VCA groups, 8 mute groups, and MIDI/PC control combine to ease the job of the FoH engineer.

↳ Monitor

- Provides 12 aux mixes.
- Up to 2 stereo mixes with individual level and pan, ideal for any combination of wedge and in-ear monitors.
- All aux masters are on faders with inserts for patching in individual mix EQ and signal processing.
- Engineer's listen wedge output on balanced XLR with insert, controlled by a 100mm fader.
- Add the individual talkback assign, intelligent PAFL system, stereo local monitor and multi-point metering to ensure the monitor engineer stays in full control.

↳ MONO INPUT [08/09]

↳ **INPUT.** XLR for mic or line level signals. +48V is individually switched for phantom powered microphones.

↳ **INSERT.** Separate send and return TRS jacks, post HPF, pre-EQ

↳ **DIRECT OUTPUT.** TRS jack. Set post-fader as standard. Internal option links for pre-fade, post-fade, or level trim using aux 1 pot.

↳ **INPUT STAGE.** Carefully engineered to maintain the sonic quality of the original source, this stage matches any mic or line signal from a low -60dBu to a high +10dBu nominal operating level. With a +31dBu maximum input capability there is plenty of headroom available.

↳ **HIGH PASS FILTER.** 12dB/ octave slope with frequency adjustable from 20Hz to 400Hz. Includes an in/out switch for instant comparisons between straight and filtered signals, or to maintain minimum signal path when the filter is not required.

↳ **4 BAND PARAMETRIC EQ.** A powerful tool, tailored for corrective or creative live performance control. HF and LF are shelving response. The mids are parametric with switched Q to allow precision sound shaping whether broad-brush or tight narrow band. The 4 bands each provide extended range frequency sweep. Adjacent bands overlap so that two can be used to deal with particular problem sounds when needed, for example using low shelf and mid bell to tighten up a sloppy bass.

Again, dual-concentric pots have been avoided to ensure that you can reach the controls you need in an instant.

↳ CHANNEL

↳ **AUX SENDS 1-8** - Switched pre or post-fade in groups of four, these feed the rotary aux masters. Reverse with the groups to feed the fader masters for full output control, for example when monitor mixing

↳ **BLEND** - Balances the signal between the LR and C output. Set fully anticlockwise for stereo PA, clockwise for mono PA, or adjust as required together with PAN when driving an LR+fill or a 3 speaker LCR system.

↳ **PAN** - Conventionally positions the signal between the L and R outputs. Used with the BLEND control this can adjust the signal balance within a 3 output LCR system.

↳ **MAIN MIX** - this single switch routes the channel signal to the L, R, C main output. The required balance is seamlessly adjusted using BLEND and PAN.

↳ **MUTE** - Turns the channel signal on or off. It is also used when editing mute, VCA groups or channel safes.

↳ **SAFE/EDIT** - This LED normally displays channels made safe. In edit mode it lights if the channel is assigned to the group being edited.

↳ **PAFL** - Auditions the channel in the headphones, local monitor and wedge output (if wedge mode is selected). Sends the mono pre-fader signal or the stereo in-place post-fader signal depending on the master PFL/AFL switch.

↳ **METER** - Displays the pre fader signal on the 5 segment channel meter. The top red LED is a multi-point peak indicator which also lights if the pre-insert, pre-EQ or post-fader signal reaches 5dB before clipping.

↳ **VCA ASSIGN** - These LEDs display which VCA groups the channel is assigned to.

↳ **FADER** - 100mm Alps K-fader provides local DC control of the channel VCA.

↳ STEREO INPUT [10]

2 fully featured dual stereo channels are fitted as standard to each frame size in addition to the standard channel count.

Stereo inputs allow connection of 2 stereo sources. These can be selected individually or mixed together, for example mixing two different reverb returns into one channel. They are more suitable for effects, 2-track players and other stereo devices than conventional aux returns, as they include full EQ, can be routed to any mix, provide metering and fader control, and are part of the console mute and VCA system.

↳ **INPUT A.** TRS jacks

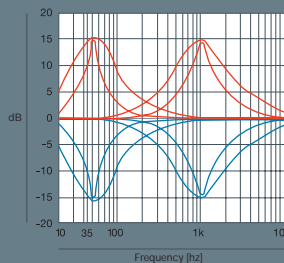
↳ **INPUT B.** XLR

↳ **INPUT STAGE.** Each input has its own gain control and on/off switch. This means that the gain does not need to be reset when switching between inputs and that the required balance can be adjusted when mixing the two sources together. The gain range of -6 to +18dB easily matches the connected line sources.

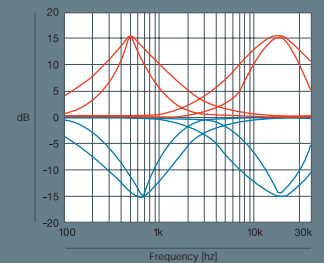
↳ **MONO LR.** with both switches up the selected source is routed through the channel in stereo. Press MONO L to select the left signal as a mono source, MONO R to select the right, or both to sum L and R together

↳ **4 BAND EQ.** LF and HF shelving response with turning point frequencies set at 60Hz and 12kHz respectively. The mid bands are bell response with centre frequencies set at 250Hz and 2.5kHz, optimised to deal with typical live sound source problems, or for creative shaping.

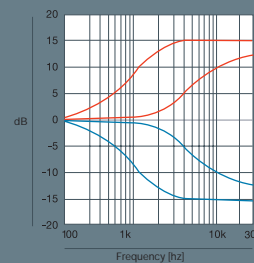
↳ fig.09



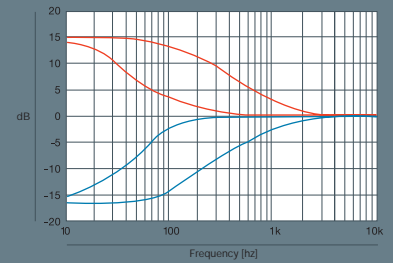
LMF sweep eq Q = in/out
[2/0.9] 35H₂ - 1kH₂



HMF sweep eq Q = in/out
[2/0.9] 500H₂ - 15kH₂



HF sweep eq 2kH₂ - 20kH₂



LF sweep eq 20kH₂ - 200kH₂

↳ ENGINEER'S TOOLBOX^[11]

Lying at the heart of the Master Section is the engineer's control panel.

↳ **METERS.** Selects whether the right hand VU meters display aux 9-12 or matrix 1-4 signals.

↳ **MONITOR SECTION.** Provides control of the headphones and stereo local monitor outputs. Source selection is LR, C or 2TRK. Pressing LR and C together mixes C into L and R, ideal for checking a 3 speaker LCR system. Pressing 2TRK overrides the LR, C selection for easy A/B comparison while P/AFL overrides any source. A PFL level trim is provided for more comfortable matching to the mix level. The source can be checked in mono. The headphones plug in under the front armrest to avoid cables trailing across the panel.

↳ **PFL/AFL.** Two switches determine the operating mode of the P/AFL system. AUTO-CANCEL where pressing a P/AFL button automatically turns off any previous selection, or ADD MODE where several buttons can be pressed to add to the mix, and INPUT PFL/AFL to select whether the input P/AFL buttons action PFL or AFL in-place.

↳ **CLEAR ALL.** This clears any P/AFL selection to quickly restore normal monitoring - ideal when you have lost track of the last P/AFL selection made.

↳ **OSC/NOISE.** The built-in generator produces either a pink noise signal for system and speaker testing, or a 1kHz sine wave for equipment line up. The large button routes it to any output with its TB assign switch selected. The recessed DISABLE switch prevents operation during live performance.

↳ **INTERCOM.** A ClearCom compatible interface is built into the console. This uses the talkback mic and monitor headphones to communicate with other stations, so preventing the annoying complication of wearing two headsets. A large lamp in the meterbridge attracts the engineer's attention when signaled. The engineer selects LISTEN to choose when to listen in to the intercom.

↳ **TALKBACK.** Plug your talkback mic in here. The recessed switch selects phantom power. Pressing the large button lets the engineer talk to any of up to 19 outputs with their TB assign switches. The button illuminates to warn if any destination is assigned.



↳fig.11

↳ SIDECAR^[12]

Up to two 24-channel sidecar expanders can be added, providing a maximum 96 channels linked via 9 way logic and 37 way audio cables.

↳ METERBRIDGE^[13]

The low profile integral meterbridge spans the full length of the console and provides no fewer than 15 illuminated VU meters, 3 LED bar meters, P/AFL active indicators and a large intercom call lamp. The 4 right hand meters can be switched to display either aux 9-12 or the matrix outputs. The main LR and C outputs are displayed simultaneously on both VU and LED peak meters giving the best of both types of metering. These automatically switch to display any active P/AFL signal in mono or stereo+mono sum as appropriate.



↳fig.12

↳fig.13



↳ POWER SUPPLY .[13]

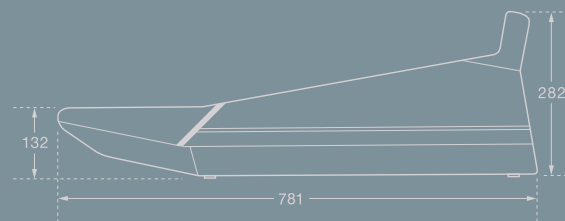
The rugged new MPS 14 slimline 2U rack mount power supply uses proven switch mode technology with linear post regulation to ensure the quietest performance. Full protection and thermal sensing fan cooling are provided. It also has a built in combiner for connection to a second supply for backup. It includes two heavy duty DC connectors for plugging to the console and linking in a redundant supply.



↳fig.13/14

↳ DIMENSIONS .[14]

	width	packed dimensions (all models)
ML4000 - 32	1451mm (57")	2300 x 650 x 1150mm
ML4000 - 40	1706mm (67")	90" x 26" x 45"
ML4000 - 48	1951mm (77")	
ML4000 - 24SC	831mm (33")	
ML4000 weights	32 Channel 65kg (143 lbs)	40 Channel 75kg (165 lbs)
	48 Channel 87kg (191 lbs)	24 Sidecar 40kg (88 lbs)
	MPS14 psu 2.5kg (5 lbs)	



↳ TECH .[15]

0 dBu = 0.775 Volts rms

OPERATING LEVELS

Channels	0dBu	Headroom +21dB
Mix	-2dBu	Headroom +23dB

FREQUENCY RESPONSE

Mic to main output	(+40dB)	20Hz to 30kHz	+0/-0.5dB
Line to main output	(0dB)	20Hz to 30kHz	+0/-0.5dB

DISTORTION @1kHz +14dBu

THD+noise	< 0.02%
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CMRR Common mode rejection @1kHz

Mic (+40dB)	> 80dB
Mic + Pad (0dB)	> 50dB

CROSSTALK Referred to driven channel @1kHz

Channel to channel	< -95dB
Mute shutoff	< -90dB
Fader shutoff	< -90dB

NOISE PERFORMANCE

Measured rms 22Hz to 22kHz unweighted	
Mic EIN with 150 ohm source	-128dB
Residual output noise	< -98dBu (-98dB SN)
Mix noise, nothing routed	< -94dBu (-94dB SN)
Mix noise, 24 channels routed	< -82dBu (-82dB SN)

METERING

Reading	0vu = 0dBu at XLR outputs
LED meters	Peak reading, 3 colours
VU meters	Ave reading, illuminated moving coil
Peak indicators	5dB before clip, multi-point sensing
Input meters	5 segment LED (sig, -6, 0, +6, pk)
Group mix meters	5 segment LED (sig, -6, 0, +6, pk)
Group/Matrix meters	VU
L,R,C meters	VU and 16 segment LED

CHANNEL FILTERS

Slope	12dB/oct high pass
Frequency	20Hz to 400Hz variable

MONO EQUALISER

HF	+/-15dB, 2kHz to 20kHz shelf
HM	+/-15dB, 500Hz to 15kHz bell, Q = 1 or 2 switched
LM	+/-15dB, 35Hz to 1kHz bell, Q = 1 or 2 switched
LF	+/-15dB, 20Hz to 200Hz shelf

STEREO EQUALISER

HF	+/-15dB, 12kHz shelf
HM	+/-15dB, 2.5kHz bell
LM	+/-15dB, 250Hz bell
LF	+/-15dB, 60Hz shelf

LAMP CONNECTORS X3

Connector	XLR-F 4pin
Rating	12V 400mA max

POWER SUPPLY MODEL MPS14

Slimline MPS14 switch-mode power supply with linear post-regulation.
Built-in combiner for connection to back-up supply.
Twin fan cooling and full protection.

↳ CONNECTIONS .[16]

INPUTS

Mic (Pad out)	XLR	balanced, pin2+	2kohm	variable -60 to -10dBu Max +11dBu
Mic (Pad in)			>10kohm	variable -40 to +10dBu Max
+31dBu				
Stereo A	TRS jack	balanced, tip+	>20kohm	variable -18 to +6dBu Max +27dBu
Stereo B	XLR	balanced, pin2+	>20kohm	variable -18 to +6dBu Max +27dBu
2-Track	TRS jack	balanced, tip+	>20kohm	+4dBu Max +25dBu
Matrix Ext in	TRS jack	balanced, tip+	>20kohm	+4dBu Max +25dBu

INSERTS

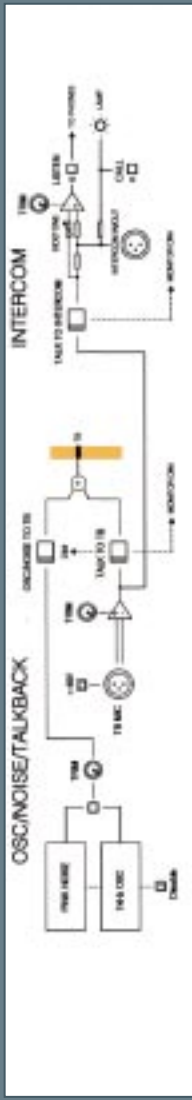
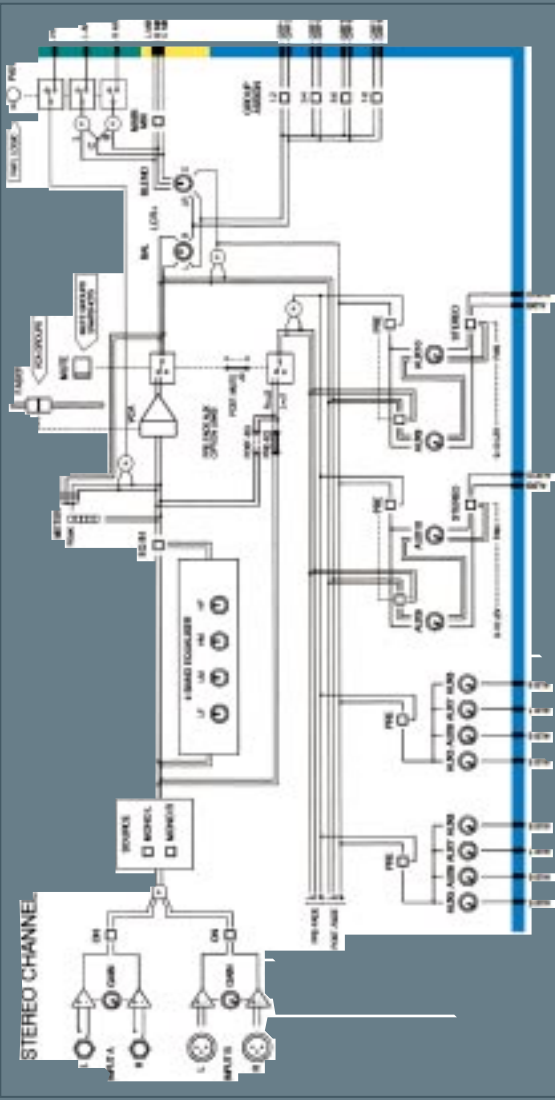
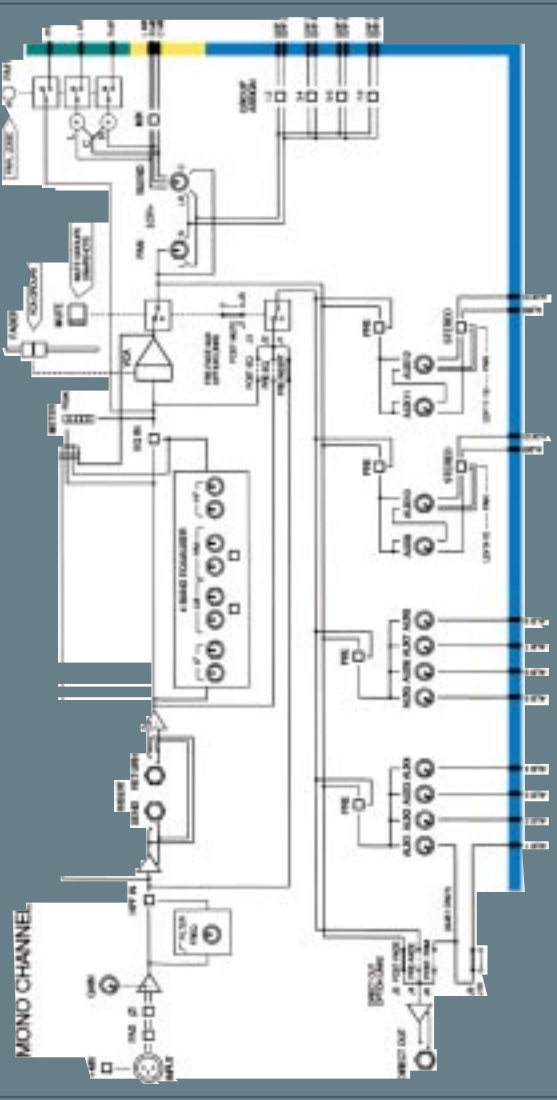
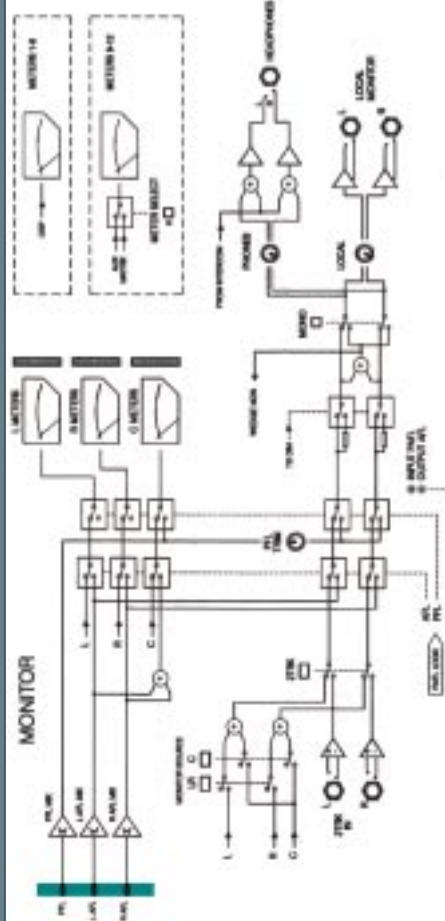
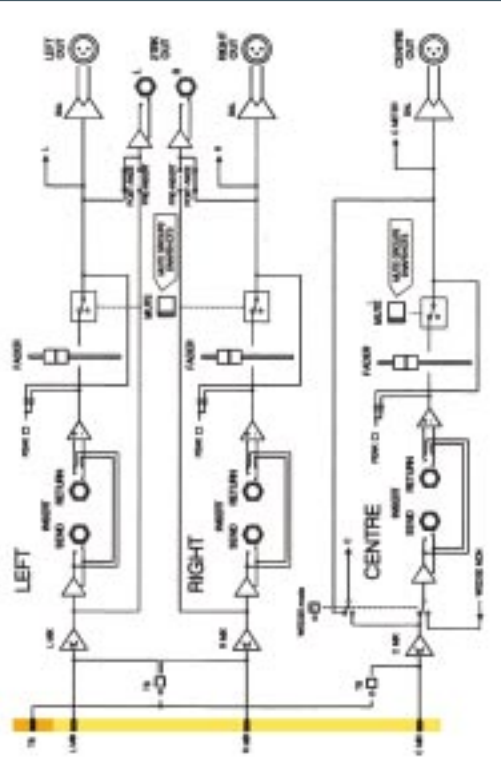
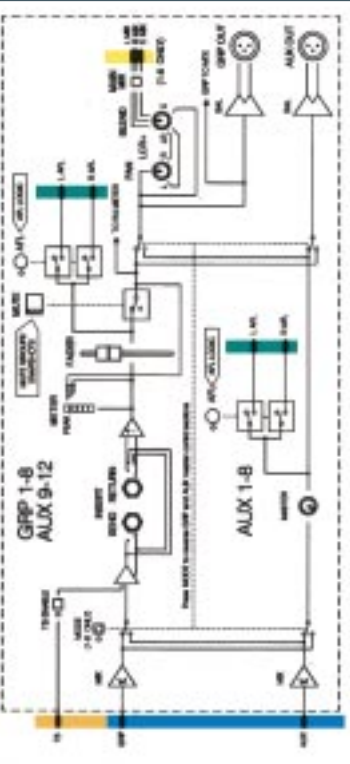
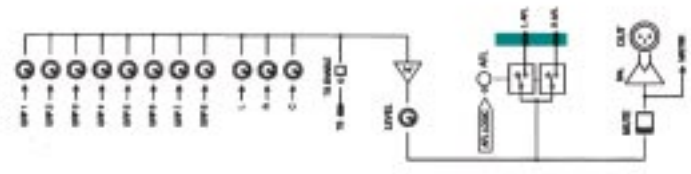
Input send	TRS jack	ground comp, tip+	<50ohm	0dBu Max +21dBu
Input return	TRS jack	balanced, tip+	>20kohm	0dBu Max +21dBu
Output send	TRS jack	ground comp, tip+	<50ohm	-2dBu Max +21dBu
Output return	TRS jack	balanced, tip+	>20kohm	-2dBu Max +21dBu

OUTPUTS

L,R,C	XLR	balanced, pin2+	<75ohm	+0dBu Max +21dBu
Grp/Aux 1-8	XLR	balanced, pin2+	<75ohm	+0dBu Max +21dBu
Matrix 1-4	XLR	balanced, pin2+	<75ohm	+0dBu Max +21dBu
Aux 9-12	TRS jack	ground comp, tip+	<50ohm	-2dBu Max +21dBu
Direct out	TRS jack	ground comp, tip+	<50ohm	0dBu Max +21dBu
2-Track	TRS jack	ground comp, tip+	<50ohm	+0dBu Max +21dBu
Local Monitor	TRS jack	ground comp, tip+	<50ohm	0dBu Max +21dBu
Headphones	TRS jack	tip left, ring right for stereo headphones	>30 ohms	



MATRIX



↳fig.15

↳ Contact

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