SERIES TWO

USER GUIDE

Soundcraft

IMPORTANT

Please read this manual carefully before connecting your Console to the mains for the first time.

Soundcraft

Series TWO

Contents

4   Console Facilities

5   Appendices

Safety Symbol Guide ·

For your own safety and to avoid invalidation of the warranty all text marked with these symbols should be read carefully.

CAUTIONS
Must be followed carefully to avoid bodily injury.

WARNINGS
Must be observed to avoid damage to your equipment.

NOTES
Contain important information and useful tips on the operation of your equipment.

Warranty

●●

1 **Soundcraft** is a trading division of Harman International Industries Ltd .

End User means the person who first puts the equipment into regular operation.

Dealer means the person other than Soundcraft (if any) from whom the End User purchased the Equipment, provided such a person is authorised for this purpose by Soundcraft or its accredited Distributor.

Equipment means the equipment supplied with this manual.

2 If within the period of twelve months from the date of delivery of the Equipment to the End User it shall prove defective by reason only of faulty materials and/or workmanship to such an extent that the effectiveness and/or usability thereof is materially affected the Equipment or the defective component should be returned to the Dealer or to Soundcraft and subject to the following conditions the Dealer or Soundcraft will repair or replace the defective components. Any components replaced will become the property of Soundcraft.

3 Any Equipment or component returned will be at the risk of the End User whilst in transit (both to and from the Dealer or Soundcraft) and postage must be prepaid.

4 This warranty shall only be valid if:

A) the Equipment has been properly installed in accordance with instructions contained in Soundcraft's manual; and

B) the End User has notified Soundcraft or the Dealer within 14 days of the defect appearing; and

C) no persons other than authorised representatives of Soundcraft or the Dealer have effected any replacement of parts maintenance adjustments or repairs to the Equipment; and

D) the End User has used the Equipment only for such purposes as Soundcraft recommends, with only such operating supplies as meet Soundcraft's specifications and otherwise in all respects in accordance Soundcraft's recommendations.

5 Defects arising as a result of the following are not covered by this Warranty: faulty or negligent handling, chemical or electro-chemical or electrical influences, accidental damage, Acts of God, neglect, deficiency in electrical power, air-conditioning or humidity control.

6 The benefit of this Warranty may not be assigned by the End User.

7 End Users who are consumers should note their rights under this Warranty are in addition to and do not affect any other rights to which they may be entitled against the seller of the Equipment.

Series TWO

1 Introduction

Introduction
•••

Thank you for purchasing a Soundcraft Series Two mixing console. The features and facilities found on the Series Two represent a new level of sophistication for a console of this size, offering greater control and higher production values to the console user and owner.

Using the classic eight-bus-eight-aux architecture first pioneered by Soundcraft in the 1970's, the Series Two incorporates state-of-the-art electronic design to achieve outstanding audio quality and flexibility of operation. The Series Two is available in 24, 32 and 40 mono input versions, each with two stereo inputs fitted as standard. The eight subgroups, auxiliary outputs and left/right/mono masters are located at the centre of the console on a single module; inputs are internally modular in blocks of eight. All connections are located at the rear of the console, including dc power connection for the DCP200 power supply unit.

The input pre-amp, which is always the starting point of a good mixing console, is a brand new design and has been optimised for ultra-low noise and improved distortion. A sweepable high-pass filter is available on every mono input to minimise unwanted stage rumble, and high-resolution LED metering gives the engineer clear visual indication of the status of the console's inputs and outputs.

The Series Two is a professional product, designed to give a lifetime's reliable service. This User Guide, as well as describing the console's facilities in detail, also offers some advice on maximising the performance of the entire audio system by the use of good system topology and professional mixing techniques. We hope that you will enjoy many productive hours at your Series Two console; by reading the User Guide now you will be able to make the most creative use of its features.

Series TWO

2 Installation

Installation

The Series Two is designed for reliability and high performance, and is built to the highest standards. Whilst great care has been taken to ensure that installation is made as trouble-free as possible, care taken at this stage, followed by correct setting up, will be rewarded by a long life and reliable operation.

Locating the Console

The console should be located at the best position for the engineer to hear what is being mixed. This is usually in the auditorium within the audience, but may be in a control room. In this case, great care must be taken to position the console centrally in the room, away from large reflective objects, as these can affect the engineer's perception of the live sound. Always ensure that enough space is available behind the console for cable connections, as they may need to be changed from time to time.

TIP:

Though the Series Two may be have to be located in a control room, an additional set of connections located in the auditorium may be useful for rehearsals or more complex productions where the positioning of the console is more critical.

Mains Power

The DCP200 power supply unit, supplied with the Series Two console, is explained in a separate User Guide. Please refer to this document for operational details.

WARNING
It is vital that the voltage setting shown on the power supply matches the AC mains supply. Incorrect supply voltage may cause damage and voids the warranty.

The DCP200 is supplied with a suitable mains lead for your region. If for some reason it is necessary to use a different connector, the following wiring code must be used:

CAUTION

Mains Wiring

Connection	Symbol	Wire colour	
Earth:	E or $\perp$	Green and Yellow	(Green and Yellow-US)
Neutral:	N	Blue	(White-US)
Live:	L	Brown	(Black-US)

Please note that for safety reasons, the Earth connection must ALWAYS be made. Power connections and cables should be checked periodically for wear and replaced immediately if damaged. To avoid risk of fire, replace the mains fuse only with the correct value fuse, as indicated on the power supply.

TIP:

To avoid excessive noise appearing at the console's outputs, do not position the console or its power supply adjacent to lighting dimmers or other high-current control gear. The mains connection for the sound system should not be shared with lighting or other control equipment. Ensure that all sound system components are connected to the same phase - if in doubt, consult a qualified electrician.

CAUTION

Mains Earthing
. . . .

A good quality mains earth connection is one of the most important aspects of any sound system installation. In a fixed installation, a 'clean earth' connection should be requested (one which is not shared by any other services and which is taken from the earliest possible point in the building. In a mobile or temporary system, great care should be taken to ensure that the earth connection, like the mains power source, is made at a single point. This enables the installer or system engineer to distribute power and earth connections in a 'star-point' configuration.

The primary function of the earth wire to the audio system is as a safety connection. It is therefore imperative that this remains intact, and has a current-carrying capacity that matches or exceeds the rating of the live and neutral feeds. The earth connection on individual pieces of equipment must NEVER be removed, even though this may temporarily solve a noise problem. Unearthed equipment is potentially DANGEROUS.

TIP:

Even though plugging the Series Two power supply or other ancillary equipment into a convenient wall-socket may be tempting, this may destroy an otherwise well-designed earthing system, and is likely to result in increased noise throughout the audio system. Extending the existing audio power distribution system is a better option.

Dimensions

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Console	Overall Width
24+4 frame	1037mm (40.83")
32+4 frame	1243mm (48.93")
40+4 frame	1449mm (57.04")
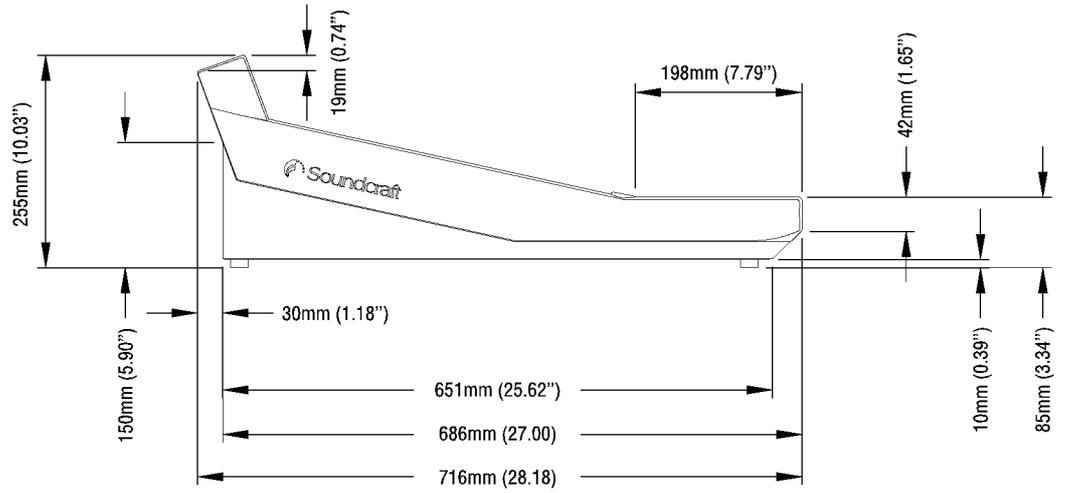
Series TWO

3 **Signal Connections**

Signal Connections

Signal connections to the Series Two fall into three groups; Inputs, Outputs and Inserts. All connections (except for the engineer's headphone socket) are located at the rear of the console.

Typical System

The typical system diagram overleaf, shows how the Series Two may be integrated into a typical sound reinforcement system. For the sake of clarity, only a few examples of external equipment are shown.

Microphones (dynamic and condenser) are on stage, with electronic instruments connected via Direct Inject boxes for balancing and isolation. Inputs may have dynamics processors inserted in their signal path, such as noise gates or compressors. The Direct Outputs may be used to feed a multitrack recorder, or even another console.

The first four Aux mixes are used here for stage monitoring, fed pre-fade from each channel. Other Aux mixes are used as effects sends; a mono mix is connected to a stereo effects processor (most of which are capable of generating a stereo output from a single input). The processor's output is routed to one of the console's Stereo Returns, where it is mixed into the relevant subgroups or main Left/Right masters.

The subgroup outputs themselves are not used in this instance, but a typical application would be an eight-track recording of the grouped signals. The group inserts points are used to add dynamics processing (usually compression) to a group of signals, such as backing vocalists, where individual processing is too costly or might be undesirable.

The console's main Left and Right outputs are sent to speaker controllers or crossovers, power amps, and the main PA system, while the Mono output is routed to a separate centre cluster. This may be used to 'localise' vocals and separate them from music programme material. In all three cases, the insert point is used to provide equalisation before the main output faders and meters.

Delays are secondary loudspeaker systems, which are usually fed from matrix outputs, enabling the engineer to modify the mix of signals being sent. The delay system would be used to cover a balcony or other far-field area and requires a time-delay to align its output with the signal from the main system.

The engineer's own monitoring is provided by a pair of small loudspeakers and an amplifier connected to the Monitor L and R outputs. To avoid confusing timing problems, it may be necessary to add a delay (not shown) to these outputs.

It should be stressed that the diagram represents a typical configuration and is by no means the only way to connect a system. Other applications may have different requirements.

EFFECTS UNIT

OUTBOARD PROCESSOR

ELECTRONIC INSTRUMENT

(STEREO RETURNS)

LOCAL MONITORS

CONDENSER MICROPHONE
(48V SWITCH 'ON')

DYNAMIC
MICROPHONE

DIRECT
INJECT
BOX

POWER
AMP

CD/MD PLAYER

(MIC INPUTS)

OUTBOARD PROCESSORS
(COMPRESSOR, LIMITER,
NOISE GATE, EQ)

GRAPHIC EQUALISER

(MONITOR O/P's)

(INSERTS)

28 27 26 25   24 23 22 21 20 19 18 17 16 15 14 13

(AUX OUTPUT)

FROM DCP200
POWER SUPPLY

TO MULTITRACK
RECORDER

(DIRECT OUTPUTS)

(L/R & MONO O/P's)

CROSSOVER

POWER AMPS

(AUX 1-4)

EQUALISERS

(MATRIX OUTPUTS)

POWER
AMPS

LEFT/RIGHT
MAIN PA

DELAY UNIT

POWER
AMP

STAGE
MONITORS

CENTRE
SPEAKER

DELAY UNIT

CROSSOVER

TO DELAY

POWER AMPS

SPEAKERS

———— FRONT OF HOUSE SYSTEM ————

Typical System Diagram

Mating (Cable) Connectors

To complete the installation of your Series Two console, you will require the following cable connectors:

Connector type	Console frame size		
	24-channel	32-channel	40-channel
3-pin XLR plug (male)	24	32	40
3-pin XLR socket (female)	3	3	3
3-pole ¼" jack plug	87	103	119
RCA phono plug	4	4	4

Note that these quantities assume that the ¼" jack line input connectors on each channel are NOT used.

Polarity

The installation of balanced connections (where the audio appears as a positive and negative signal on two cores of a 'paired' cable) requires particular care to preserve the correct signal polarity. Even though an incorrectly wired connection may appear to work on its own, the signal may be 'phase inverted', causing enormous problems when it is mixed with other, correctly-wired, signals. Problems with incorrect polarity are most commonly found in multicore cables, so a clear and logical wire colour code should be adopted and documented by the installer.

Screening

All microphone and line-level signals should be screened; that is, the signal-carrying cores should be covered by a continuous shield of conductive material, usually either copper braid, copper foil or conductive plastic. This helps to prevent the audio signal from being contaminated with unwanted interference from radio signals and nearby high-power equipment.

Under normal circumstances, connecting the screen of the cable, or the 'drain wire' that is connected to the screen, at both ends will give optimum results. However, is some instances, in order to avoid 'hum loops' (screen-borne noise caused by poor equipment earthing), it may be beneficial to disconnect the screen at the receiving end only. It should be understood that this is a last resort; if hum loops are present, earthing the audio equipment properly is the only real solution. Please refer to the earlier section on power connection for more details.

Connector Wiring

Microphone Inputs

Each mono input channel is equipped with a balanced microphone input, which uses an industry-standard 3-pin XLR socket, requiring a cable-mounted XLR plug to be used to make the connection. This input is suitable for a wide variety of sources, including low-impedance dynamic, condenser and ribbon microphones, as well as direct-inject (DI) boxes.

The Series Two XLR inputs are wired according to the following standard:

Pin 1   Screen

Pin 2   Hot   (+ve signal)

Pin 3   Cold   (-ve signal)

When phantom power is switched on using the rear panel switches, 48V dc is supplied to pins 2 and 3 of the XLR. This may be used to provide remote power for condenser microphones or some types of DI boxes.

For connection to an unbalanced source, the XLR plug should be wired as follows:

Pin 1   Screen

Pin 2   Signal

Pin 3   Link to Pin 1

Balanced Mic XLR

2. Hot(+ve)
3. Cold(-ve)
1. Screen

Unbalanced Mic XLR


2. Hot(+ve)
Link 3 to 1
1. Screen
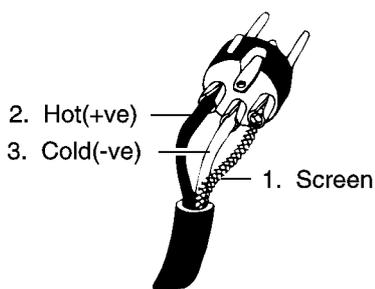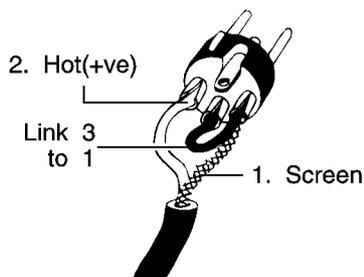
TIP:

Unbalanced microphone-level connections are not suitable for use over long runs of cable, due to their low immunity to interference. Use balanced cables wherever possible to reduce the risk of noise affecting the system.

WARNING
Do not use unbalanced connections with phantom power. The voltage between pins 1 and 2 of the XLR connector may cause serious damage.

Balanced
3 pole Jack

Hot (+ve) — Signal
Cold (-ve) — Gnd/Screen
Gnd/Screen — Gnd/Screen

Tip

Ring ———— Sleeve

Unbalanced
3 pole Jack
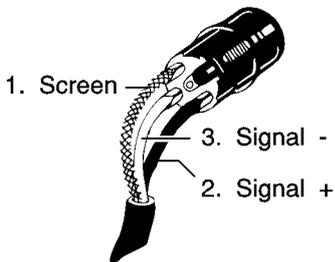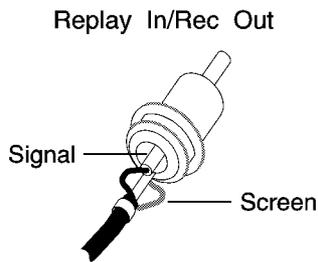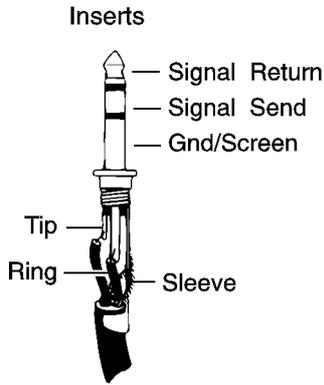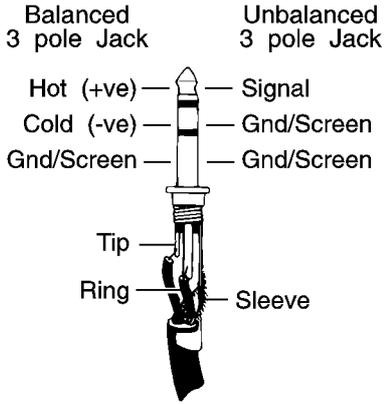
Line Inputs

Line inputs are available on all mono channels in addition to the two fixed stereo channels at the centre of the console. Other line-level input connections are the four stereo returns, which use eight connectors.

A 3-pole ¼" tip-ring-sleeve socket is used for balanced line-level inputs, requiring a 3-pole or 2-pole cable-mounted plug. Note that if a 2-pole plug is used, the source will be unbalanced and may be prone to external interference.

Wiring the ¼" jack should be done according to the following code:

Tip   Hot   (+ve signal)
Ring   Cold   (-ve signal)
Sleeve Screen

For a 2-pole jack, the following convention is used:

Tip   Signal
Sleeve Screen

3-pole jacks may be used even if the source and cable are unbalanced. Ensure that the ring and sleeve connections are linked inside the plug.

TIP:

The XLR input is low-impedance and suitable for most professional equipment. Due to the 20dB 'Range' switch fitted to each input, the XLR may also be used with line-level signals. Phantom power is not available on the ¼" jack connector. In a typical live environment, all lines from the stage would be connected to the console's XLR inputs.

Inserts

Signal Return
Signal Send
Gnd/Screen

Tip

Ring ———— Sleeve

Tape Replay Inputs

A Stereo Replay input is provided for connection to a tape machine, CD player or other line-level source. This uses RCA phono connectors wired according to the universal standard:

Inner   Signal
Outer   Screen

Inserts

Inserts are combined input/output connections, and provide a break in the signal path to allow an external processor (such as a gate, compressor or equaliser) to be used on an individual input or output. The Series Two uses 3-pole ¼" jacks to provide an unbalanced 'send' and 'return' connection, which share the same cable and screen.

TIP:

Different manufacturers use different standards for insert wiring. Please check before using any existing insert cables with your Series Two console. All Soundcraft professional consoles use the tip of the jack for the return signal, and the ring for the send.

Insert points are available on all Mono Inputs, subgroups 1-8 and the Left/Right/Mono masters. The wiring for cable connectors is as follows:

Tip   Return   Input to the console
Ring   Send   Output from the console
Sleeve Screen

Replay In/Rec Out

Signal

Screen

1. Screen

3. Signal -
2. Signal +

Mix & Group Inserts

— Signal Return
— Signal Send
— Gnd/Screen

Tip —

Ring —

— Sleeve
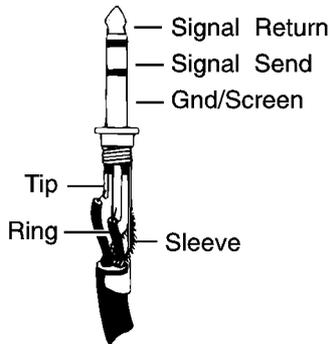
Group Outputs
Matrix Outputs
Aux Outputs
Direct Outputs

—Signal +
— Signal -
— Screen

Headphones

—Left Signal
— Right Signal
— Ground
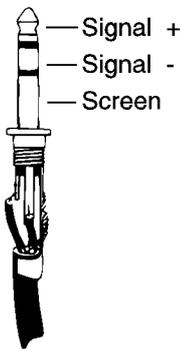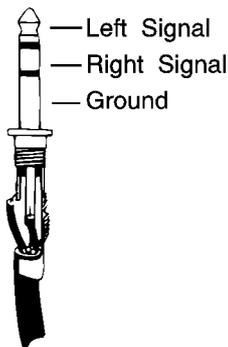
TIP:

The Series Two sends a permanent, pre-fade signal to the 'send' connection, enabling the user to tap off a feed of a channel, group or master. This can be done by using a 3-pole jack with the tip and ring shorted to keep the signal path intact.

Balanced Outputs

The centre section of the Series Two contains the console's outputs; these are electronically balanced for optimum immunity to external noise. Primary outputs (Left, Right and Mono master busses) utilise 3-pin XLR connectors; the cable-mounted mating sockets should be wired as follows:

Pin 1 Screen

Pin 2 Hot (+ve signal)

Pin 3 Cold (-ve signal)

Impedance-balanced outputs are provided on 3-pole ¼" jack sockets for Subgroup 1-8, Aux 1-8, Matrix 1 and 2, and Monitor Left and Right. Each mono channel also has an impedance-balanced direct output. These should be wired to the standard pin-out:

Tip Hot (+ve signal)

Ring Cold (-ve signal)

Sleeve Screen

TIP:

If the external device that is receiving the console output is unbalanced, the best result will be obtained by using paired, screened cable. Connect the tip of the ¼" jack to the 'hot' (+ve signal) core, with the sleeve (and ring, if using a 3-pole plug) connected to the 'cold' (-ve) core and screen. It may be advantageous to connect the cable screen at the console end ONLY.

Unbalanced Outputs

The only unbalanced line-level outputs provided by the Series Two are the Left and Right Record outputs, which use RCA phono connectors. Cable plugs should be wired in the same way as the Tape Replay connectors, shown on the previous page.

Headphone Output

The engineer's headphone socket is located on the front panel, near the group faders at the centre of the console. It is wired to standard industry convention and is compatible with most stereo headphones. Should it be necessary to re-wire a headphone cable, the following pin-out should be used:

Tip Left (often a white wire)

Ring Right (usually a red wire)

Sleeve Screen

Series TWO

4 Console Facilities

Console Facilities

The Series Two's features are divided into the following sections:

- Mono Input
- Stereo Input
- Stereo Return
- Group Output
- Aux Output
- Master Output
- Matrix Output
- Monitoring
- Talkback and Oscillator
- Scene Control

Mono Input
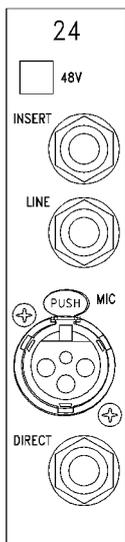
Connections (Rear Panel)

The Mono input is fitted with a 3-pin XLR (low-impedance signals) and 3-pole ¼" jack (high-impedance signals). Plugging a jack into the Line jack will override any signals connected to the XLR input. The Line jack is isolated from phantom power, even if this is switched on. Another 3-pole ¼" jack socket provides the pre-EQ insert point, while a third socket is used for the channel's direct output. This signal is normally post-fade but may be switched to pre-fade (post EQ) by the DIR PRE button on the front panel.

48V Switch

48V dc phantom power is available on the input XLR connector only, and is activated by the rear-panel 48V switch, located above the Insert connector.

TIP:

Do not plug microphones in with the phantom power switched on, as this may damage some types of microphone. Always check the status of the rear panel switch before connecting a source to the Series Two.
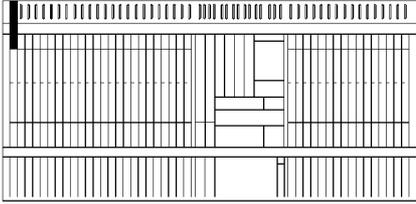
Input Level Meter

Each Mono Input has a 12-segment LED bargraph meter, located in the raised meter bridge above the channel. This indicates the pre-fade, post-EQ signal (in other words, it will be affected by any EQ or outboard processing used, but not by the fader or mute switch).

The PK (Peak) LED at the top of the meter shows the peak level at the insert send and pre-fade points - if the signal at either of these key points reaches 3dB below clipping, the PK LED will stay lit for a short period.

SENS control

The input sensitivity may be varied from -60dBu to -15dBu using this rotary control. The SENS rotary control should normally be set so that the loudest signal peaks do not quite illuminate the PK indicator at the top of the input level meter. This will ensure that there is enough gain added to the input signal, to maximise the signal to noise performance without clipping the internal circuitry.

-20 Switch

When depressed, this switch reduces the sensitivity of the input stage by 20dB. This allows high-level signals (up to +26dBu) to be adjusted via the SENS control for optimum level. Unlike many mixers, this is not a 'pad' (which can have a detrimental effect on the signal), but gives the SENS control an overall range of -60dBu to +26dBu.

Ø Switch

This switch is used to reverse the phase of the input signal to compensate for incorrect wiring or microphone placement.

TIP:

If using two microphones on a snare drum (one positioned above and one below the drum), reversing the phase of the lower microphone will prevent any low-frequency cancellation between the two inputs, and will give a fuller, richer sound.

H/P Controls

Each Mono Input is provided with a variable-frequency High Pass Filter, which may be activated by the H/P switch. The filter will progressively remove all signal below the frequency selected by the rotary control, which has a range from 40Hz to 400Hz. The 'slope' of the filter is 12dB per octave; in other words, if the rotary control is set to 120Hz, the frequency response of the channel will be -3dB at 120Hz, -15dB at 60Hz and -27dB at 30Hz. The HP filter can be used to remove stage rumble from sources that do not require low-frequency information, or to reduce 'popping' on vocal microphones.
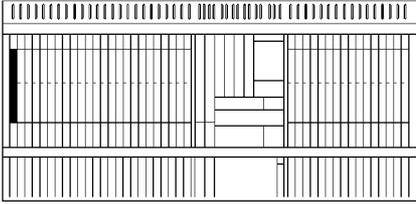
Equaliser

The equaliser fitted to the mono input is a four-band design, with fixed frequency high and low-frequency bands, plus variable frequency high-mid and low-mid sections. The four bands are defined as follows:

Type	Control Band	Frequency Range	Cut/Boost
HF	High	12kHz	+/-15dB Shelving
HMID	High-Mid	550Hz - 13kHz	+/-15dB Peak/Dip
LMID	Low-Mid	80Hz - 1.9kHz	+/-15dB Peak/Dip
LF	Low	60Hz	+/-15dB Shelving

The HF and LF sections are equipped with a single cut/boost control, which has a centre detent. The HMID and LMID sections have an additional rotary control, which is used to vary the centre frequency of the cut or boost curve.

See Appendix D for EQ curves.

TIP:

When using the equaliser to reduce the level of an excessively loud group of frequencies, it is advisable to use the cut/boost control to first emphasise the frequency. Sweep the centre-frequency to identify the worst sound; then turn down the level of the cut/boost control until the frequency band is sufficiently reduced.

An overall EQ in/out switch is provided, allowing the engineer to bypass the equaliser controls if required.

Auxiliary Sends

The Series Two provides eight aux mixes, which may be used to generate special feeds for stage monitoring, backstage foldback or effects sends for reverb units, etc.

Aux 1-8 are normally post-fade (their level is affected by the channel fader position), but each pair of aux sends may be selected to be pre-fade (post-EQ) by a switch located between each pair of controls. The pre-fade point may be changed to be pre-EQ by depressing the PRE=PREQ switch.

Typical uses for the three aux types are as follows:

Post fade	Send to effects unit	Effects mix is based on original signal mix levels
Pre fade/Post EQ	Stage monitoring	Level is set independently of FOH mix but is EQ'd
Pre fade/Pre EQ	Monitoring/Recording	Offers a fixed, uncorrected feed of input signals

Whether the aux sends are selected to be pre or post-fade, they are always muted by the channel MUTE switch (see below). Pre-fade sends (whether pre or post EQ) are taken post-insert, so are affected by any external processing that may be in use.
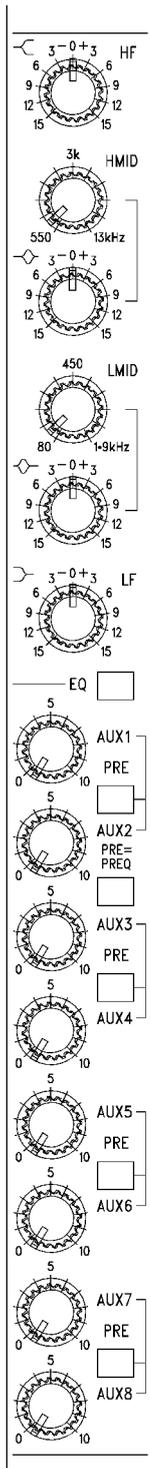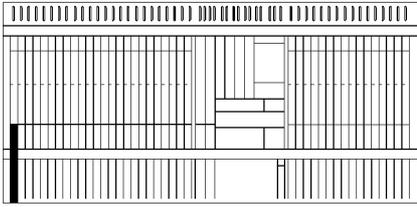
Routing and PAN Controls

The Series Two benefits from having eight subgroups for sub-mixing inputs before generating a final output mix. Each input channel may be routed to the subgroups in pairs using the four switches (1-2, 3-4, 5-6, 7-8).

Direct routing to the stereo master outputs is achieved by the MIX switch, while the MONO switch sends the signal to the mono master output.

The rotary PAN control is used to vary the relative levels of the input being fed into the left (or odd) and right (or even) outputs. This control affects all subgroups and the stereo master outputs. At its centre point, the pan control feeds the signal to both busses at -4.5dB. When the control is turned fully clockwise, the signal is sent to the even groups only; when fully counterclockwise, only the odd groups are fed.
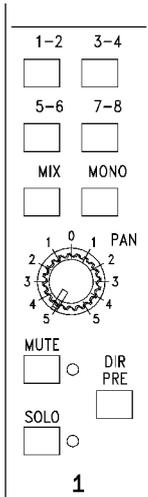
MUTE Button

The Mute switch cuts the signal to the group and master mixes, as well as any pre or post-fade aux sends. The LED next to the button is used to indicate that the mute is activated. This can be done by pressing the button or through the Scene Control system (see Scene Control, Page 4.19).

In certain circumstances, the MUTE LED is used to indicate that the channel is 'Mute Safe' (it is not affected by the automation system). Please refer to Scene Control for an explanation of this function.

DIR PRE Button

This is used to select the direct output to be pre-fade (pre-mute). This is particularly useful for recording a live performance; individual channels may be sent to a multitrack recorder using the pre-fade direct output, safe in the knowledge that the tape level will be unaffected by the mix required for the live sound.

If the button is not pressed, the direct output receives a post-fade signal.

SOLO Button

The normal function of this button is to provide a pre-fade listen feed of the channel to the engineer's headphones (which is displayed on the MONO/PFL meter). In this way, inputs may be checked while the performance or rehearsal is in progress, without interrupting the feed to the main system. However, if the SIP function is active (see Solo-In-Place), the SOLO button allows the channel to be heard exclusively at the main outputs. All channels that do not have their SOLO buttons pressed are muted. In this mode, the input signal is heard post-fade, and is affected by the PAN control. An active SOLO is shown by the adjacent LED, and also by the PFL/AFL LED on the master section.

Channel Fader

Mono Inputs are fitted with 100mm long-throw faders that control the level of signal being fed to the groups, the Left/Right/Mono masters and any post-fade auxes. At its lowest point, the fader effectively mutes the signal, while at the top of its travel, it can be used to add 10dB of gain to the channel's level. The optimum level, however, is at or close to the '0' mark. This represents 0dB or 'unity gain' - the signal passes through the fader without changing level.

TIP:

The area around the 0dB point on the fader is designed to allow the engineer to make fine adjustments to the mix. If you are operating the console with the fader near the bottom of its travel, you should use the SENS control or -20 switch to decrease the input level.
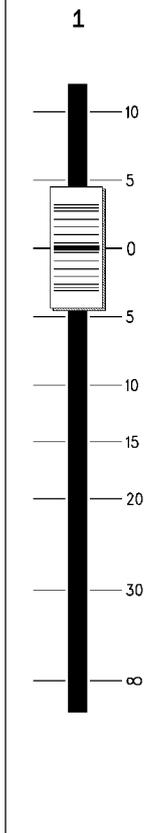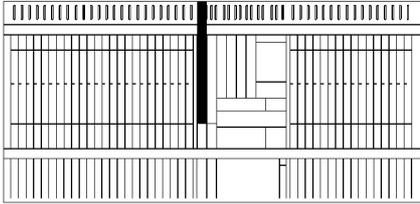
Stereo Input

Two fully-featured Stereo Inputs are fitted to the Series Two, adjacent to the central output section. Typical uses would be inputs from line-level playback devices (CD or MD players, tape machines), submixes from other sources, such as a sequencer or keyboard mixer, or returns from stereo effects units.

Connections (Rear Panel)
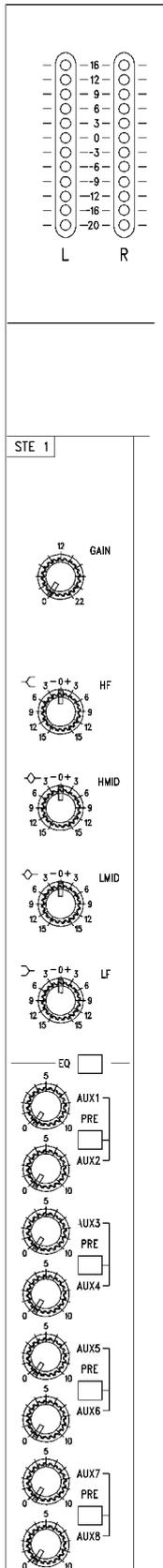
Each Stereo Input is fitted with two balanced 3-pole ¼" jacks and will accept line level balanced or unbalanced signals.

Input Level Meter

Each Stereo Input has a pair of 12-segment LED bargraph meters, located in the raised meter bridge above the channel. These indicate the left and right pre-fade, post-EQ signal (in other words, they will be affected by any EQ or outboard processing used, but not by the fader or mute switch).

GAIN control

The line input gain may be varied from 0dB to +22dB using this rotary control. The GAIN rotary control should normally be set so that the loudest signal peaks do not quite illuminate the top LED of the input level meters. This will ensure that there is enough gain added to the input signal, to maximise the signal to noise performance without clipping the internal circuitry.

Equaliser

The equaliser fitted to the Stereo Input is a four fixed-band design, with carefully selected high, high-mid, low-mid and low-frequency bands. All four sections are equipped with a single cut/boost control, which has a centre detent.

The EQ controls provide +/-15dB of cut or boost at frequencies of 12kHz, 3kHz, 320Hz and 60Hz respectively.

An overall EQ switch is provided, allowing the engineer to defeat the equaliser controls if required. This may be used to compare the equalised and 'raw' signal to verify that using the EQ has improved the sound.

Auxiliary Sends

All eight aux mixes are accessible from the Stereo Input; the stereo signal is summed to mono before being routed to these busses.

As with the Mono Input, aux sends are normally post-fade (their level is affected by the channel fader position), but each pair of sends may be selected to be pre-fade (post-EQ) by a switch located between each pair of controls.

Whether the aux sends are selected to be pre or post-fade, they are always muted by the channel MUTE switch (see next page).
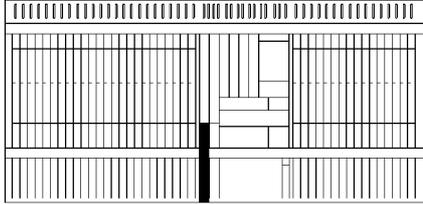
Routing and BAL Controls

Stereo inputs may be routed to the eight subgroups for sub-mixing or to the stereo (Left/Right) masters. Stereo inputs are routed so that the Left channel is sent to the odd groups, while the Right side is fed to the even busses using the five switches (1-2, 3-4, 5-6, 7-8, MIX).

The rotary BAL (Balance) control is used to vary the relative levels of the input being fed into the left (or odd) and right (or even) outputs. This control affects all subgroups and the stereo master outputs.

At its centre point, the BAL control feeds the signal to the busses at 0dB (unity gain). When the control is turned fully clockwise, the signal is sent to the even groups only and is boosted by 4dB; when fully counterclockwise, only the odd groups are fed.
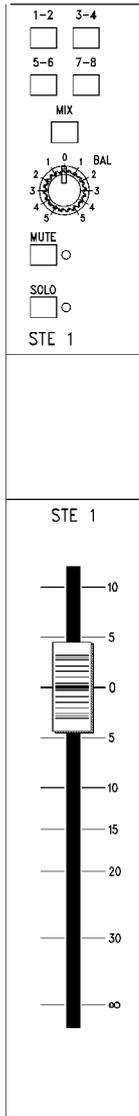
MUTE Button

The Mute switch cuts the signal to the group and master mixes, as well as any pre or post-fade aux sends. The LED next to the button is used to indicate that the mute is activated. This can be done by pressing the button or through the Scene Control system (see Scene Control, Page 4.19).

In certain circumstances, the MUTE LED is used to indicate that the channel is 'Mute Safe' (it is not affected by the automation system). Please refer to Scene Control for an explanation of this function.

SOLO Button

The normal function of this button is to provide a mono pre-fade listen feed of the channel to the engineer's headphones and the MONO/PFL meter. In this way, inputs may be checked while the performance or rehearsal is in progress, without interrupting the feed to the main system. However, if the SIP function is active (see Solo-In-Place), the SOLO button allows the channel to be heard exclusively at the main outputs. All channels that do not have their SOLO buttons pressed are muted. In this mode, the input signal is heard in stereo, post-fade, and is affected by the BAL control. An active SOLO is shown by the adjacent LED.

Channel Fader

Stereo Inputs are fitted with 100mm long-throw stereo faders that control the level of signal being fed to the groups, the Left/Right masters and any post-fade auxes.

Stereo Return

The Series Two is fitted with four stereo returns (RET1 - RET4), which accept line-level signals and may be used for submix inputs, effects returns, or as additional stereo inputs if required.

Connections (Rear Panel)
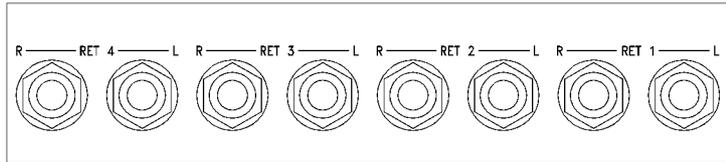
Each Stereo Return is fitted with a pair of balanced 3-pole ¼" jacks as input connectors. Balanced or unbalanced line-level signals may be used.
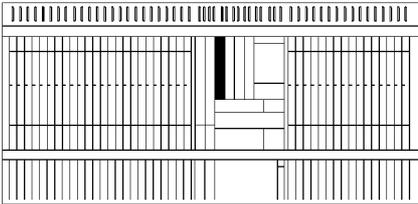
GAIN Control

Input gain may be adjusted from 0dB to +22dB using this rotary control. The GAIN rotary control should initially be set so that when the Stereo Return PFL button is pressed (see below), the normal level shown on the PFL/MONO meter is around the '0' mark.

TILT Control

This rotary control provides a tone control function over the stereo return signal. When turned clockwise, the level of high frequencies is boosted by up to 6dB, while low frequencies are attenuated by a similar amount. Turning the control counterclockwise increases the low-frequency content and reduces the HF level.

TIP:

This function may be used to 'brighten' signals being sent from effects units by boosting the high-frequency level - but beware of increasing the noise generated by outboard devices.

Aux Sends

Four rotary controls are provided on the Stereo Return for creating aux sends - these are shared between pairs of auxes, selected by two switches (3-4 and 7-8). With no switches pressed, the four controls route the signal to Aux 1, 2, 5 and 6. All aux sends from the Stereo return are post-fade.

TIP:

Great care should be taken when using the Stereo Returns as effects inputs to avoid sending a Return signal back to the aux mix that is used to feed the effect unit. This will create, at best, strange effects, and at worst will cause a feedback loop that will be uncontrollable.
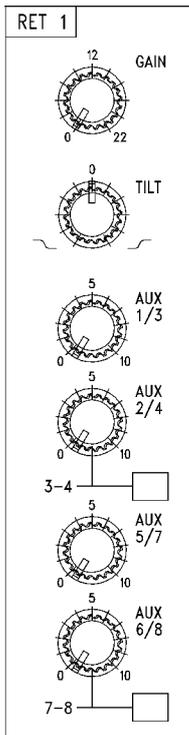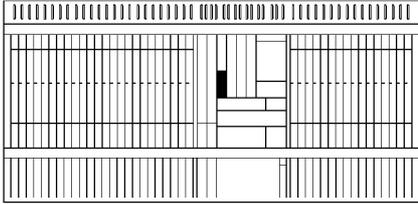
Routing Switches

The Stereo Return signal is routed in stereo using the subgroup (1-2, 3-4, 5-6, 7-8) and MIX buttons. Routing is post-fade and post-mute.

TIP:

Where a group of signals has been sent to an effects mix, routing the associated Stereo Return into the same subgroup instead of directly to mix will ensure that the effects level is mixed at a constant level with the original signals.
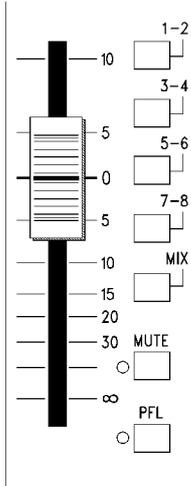
MUTE Switch

As with other inputs, the MUTE switch affects the subgroup and Left/Right master feeds, as well as the aux sends. The LED next to the button is used to indicate that the mute is activated, either by pressing the button or through the Scene Control system (see Scene Control, page 4.19).

In certain circumstances, the MUTE LED is used to indicate that the channel is 'Mute Safe' (it is not affected by the automation system). Please refer to Scene Control for an explanation of this function.

PFL Switch

This sends a mono sum of the pre-fade Stereo Return signal to the Monitoring outputs (see below) and the PFL/MONO meter. The PFL buttons cannot be used to generate a Solo-in-Place function, if this has been enabled.

Stereo Return Fader

Stereo Returns are fitted with 60mm faders, with a range from +10dB to -∞dB (muted). The fader affects the level sent to the subgroups, Left/Right masters and aux mixes.

Subgroup Output

The Series Two is an 'eight-bus' console, meaning that it has eight discrete sub-groups. These may be used to create mono mixes of signals, or may be paired to generate stereo sub-mixes. Typically, these would be used to group instruments in logical sections; for example, the numerous microphones used to cover a choir can be allocated to a stereo subgroup, allowing the engineer to use the channel PAN controls to make up a stereo submix. During the show, if the level is too high or low, the entire choir can be adjusted using just two faders.

Connections (Rear Panel)
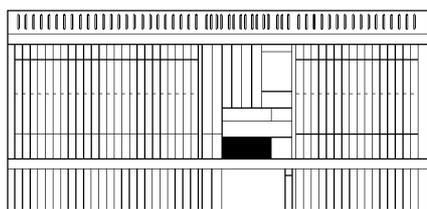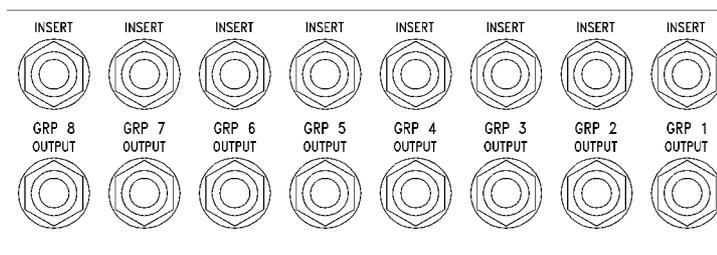
Subgroup outputs are available on the rear panel via balanced 3-pole ¼" jack sockets. These outputs may be used for 8-track recording, or for sending the subgroup mixes to another console.

Each subgroup also has an insert point; this uses another 3-pole ¼" jack, wired according to the same convention as the input insert points (see Signal Connections).

Routing and PAN Controls

The subgroup output is fed to a rear-panel connector, but may also be routed into the stereo (Left/Right) masters and/or the Mono master, using the MIX and MONO buttons. When sending the subgroup to the MIX masters, the PAN control affects the signal's placement in the stereo field.

TIP:

Where two subgroups are used as a stereo pair, the 'width' of the stereo mix may be varied by using the two associated PAN controls. Also, varying one of the PAN controls will alter the 'position' of the stereo pair in the main mix, by biasing the image to the left or right.

PFL Button

This is used to send a pre-fade subgroup signal to the Monitoring section (see below). This function is not affected by Solo-in-Place.

Insert Point

Each subgroup has a pre-fade insert point, which may be used to add an external processor (such as a compressor/limiter) to the signal path. This is especially useful where the amount of external processing is limited, or where it is important that a group of signals requires the same process. A typical example is a stereo multiple-keyboard submix; it is more important to maintain a constant keyboard level than to compress each instrument individually.

TIP:

Since the 'send' of the insert point is constantly live, it is possible to use the insert point as a pre-fade subgroup output, for example for a constant-level multitrack recording of a live performance. However, care must be taken when wiring the cables to ensure that the signal is fed back into the 'return' of the connector.
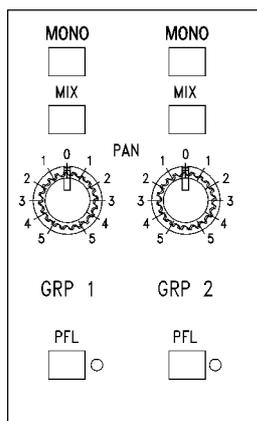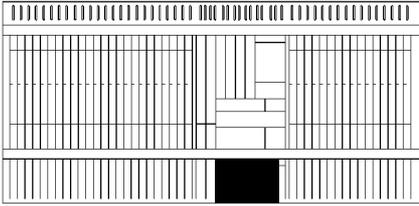
Subgroup Fader

Each subgroup has a 100mm long-throw fader, which affects the level being sent to the Left/Right/Mono masters, as well as the rear panel output connector. The fader allows up to +10dB of gain and will effectively mute the signal at the bottom of its travel.
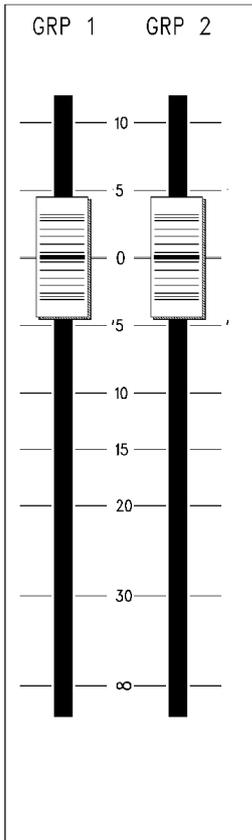
Aux Output

Connections (Rear Panel)
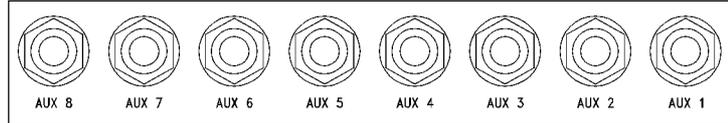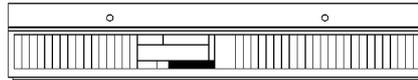
Each aux output is equipped with a ¼" 3-pole jack socket, which provides a balanced, line-level output of the aux mix.
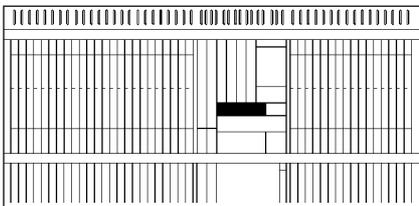
Aux Master Level Control

The Series Two is equipped with eight rotary Aux Master controls, which vary the output level of the mix from 0dB to -∞dB (off).

AFL Button

This sends a post-master fader aux signal to the Monitoring section and to the PFL/MONO meter, allowing the engineer to check that the output level is correct. This is not affected by the Solo-in-Place function.
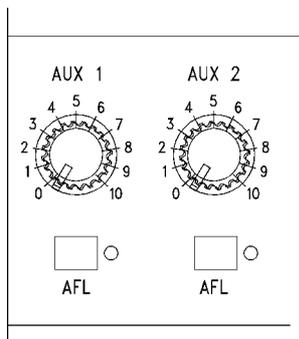
Connections (Rear Panel)
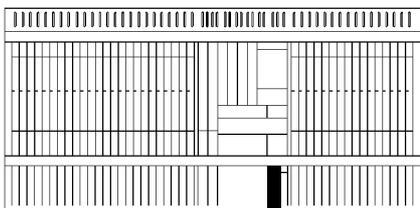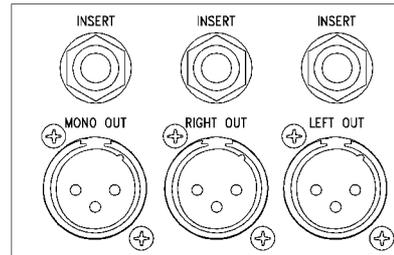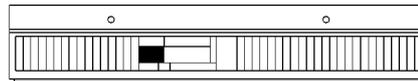
The Series Two has three master busses; Left, Right and Mono. These appear on 3-pin XLR connectors and are balanced, line-level signals. Each master bus also benefits from a pre-fade insert point, available on a 3-pole ¼" jack socket.

Insert Point

The pre-fade insert point is used to add external processing (such as a graphic equaliser) to the signal path of the master outputs. Placing outboard equipment at this point in the signal chain is important, as it enables the engineer to make level corrections after the processing has been done. Also, with a processor inserted before the fader, the true signal level is being shown on the output meters.

MIX/MONO Faders

The Left/Right outputs share a stereo 100mm long-throw fader, which affects the level being sent to the rear panel output connector. Similarly, the Mono output has a separate 100mm fader. The faders allow up to +10dB of gain and will effectively mute the signals at the bottom of their travel.
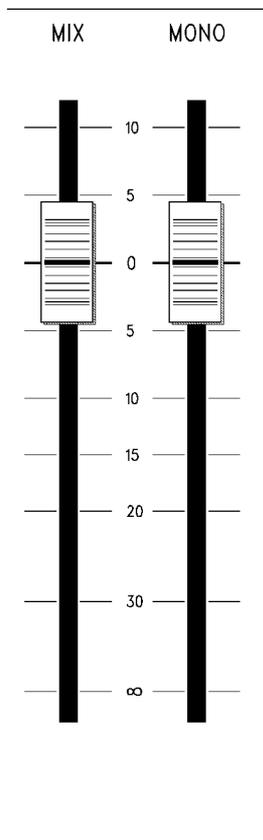
Matrix Output

Connection (Rear Panel)
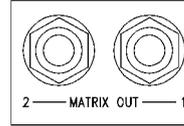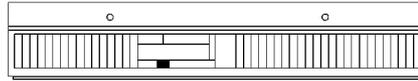
The Series Two's Matrix outputs (1 and 2) are provided with balanced 3-pole ¼" jacks for connection to delay systems or other ancillary equipment.
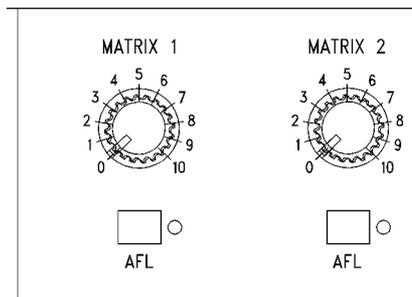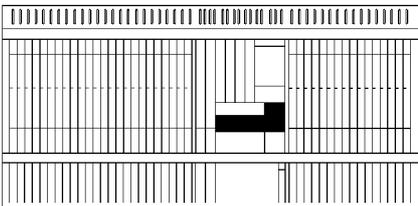
Send Controls

The eight subgroups, as well as the Left/Right/Mono masters, are able to access the two-output matrix via the rotary controls located above the subgroup outputs. These have a range from 0dB (unity gain) to -∞dB(off). The feed to the matrix is post-fade (post-mute) in each case.

Master Controls and AFL

Matrix 1 and 2 have overall rotary level controls, which can be used in association with the AFL button to ensure that the correct level is being sent. The AFL button routes the post-fade signal to the Monitoring section and the MONO/PFL meter.
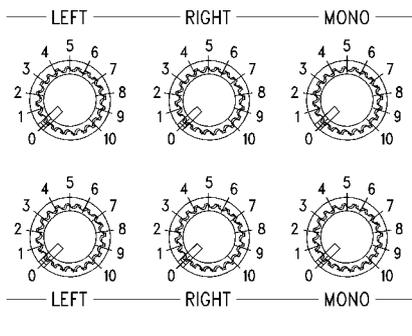
Monitoring

This section provides the engineer with the controls and functions to check that the console is operating at the correct signal levels. Dedicated metering and a separate audio output mean that monitoring may be carried out while a performance is in progress, without interrupting or affecting the main outputs. A stereo monitor output is available for connection to a local amplifier and speakers, enabling the engineer to listen to any PFL/AFL/SOLO selection.

Connections (Rear Panel)
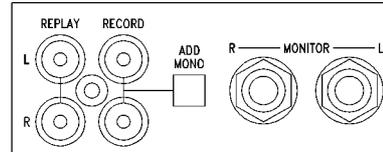
The balanced, line-level Monitor output is available on a pair of 3-pole ¼" jacks (MONITOR L and R). A REPLAY input and RECORD output, also in stereo, are provided on RCA Phono connectors.

TIP:

Though the Monitor outputs are provided in stereo, the stereo effect will only be heard if Solo-in-Place is used, if the Replay input is monitored, or if the stereo mix is being monitored inside an isolated booth or remote area. If these are not required, a mono amplifier and single speaker will suffice.
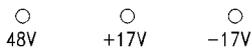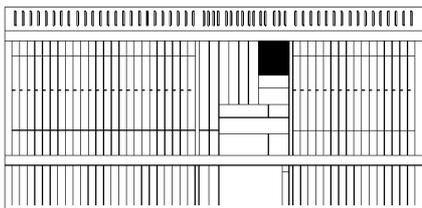
Replay Section

The Replay inputs may be used for any playback device such as a CD, MD or tape machine. Using these inputs avoids having to allocate a full stereo input for a device where no EQ is required.

There is also a Record output, in stereo, which is a duplicate feed of the Left/Right outputs, but at a reduced level suitable for most cassette or MD recorders.

TIP:

If recording a performance on a stereo machine, the Replay inputs can be used to return the off-tape signal to the console for monitoring.

ADD MONO Switch (Rear Panel)

This allows the output of the Mono master to be summed with the Left/Right mix before being sent to the recording device, via the RECORD connectors. This allows signals routed to a centre cluster, but not to the main mix, to appear in the recording as if they were panned centrally.

Replay Level

This rotary control affects the level of the Replay input and is the only level control before the signal reaches the MIX busses.

REPLAY TO MIX Switch

This routes the post-level-control Replay signal to the Left/Right master busses. Note that this switch should not be activated if the Replay input is being used for off-tape monitoring.
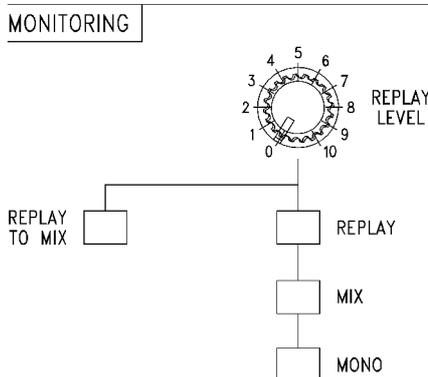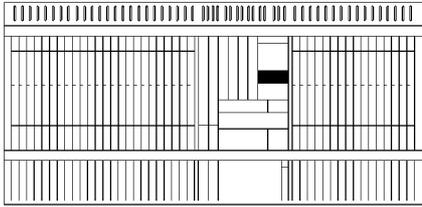
Monitor Selection Switches

The REPLAY, MIX and MONO switches are used to select the normal source for the stereo Monitor output. This selection will be overridden by any PFL, AFL or SOLO button being activated.

TIP:

*If you do not require a 'default' feed to be sent to monitors, deselect all three of these switches. This will mean that a signal is only present on the Monitor outputs when a PFL/AFL/SOLO button is pressed, and means that there is never any doubt as to what is being monitored.*

SOLO-IN-PLACE

Solo-in-Place effectively replaces the entire Left/Right mix output with an individual signal, enabling the engineer to hear the isolated input in its correct position in the stereo image (with effects returns if necessary).

The SIP function is made 'ready' by pressing the Solo-in-Place switch; this lights the amber warning LED. Following this, pressing any channel SOLO button will activate the system, as indicated by the adjacent red LED.
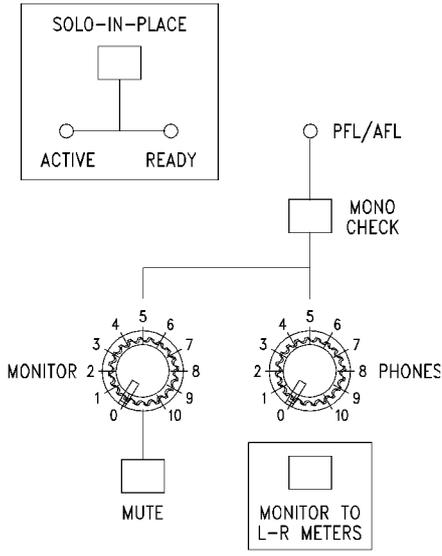
> **WARNING:**
> **This function should never be selected during a performance, as the soloed input(s) will be heard by the entire audience. Always make sure that the 'READY' LED is not lit before starting a show.**

PFL/AFL LED

This LED is illuminated whenever a PFL, AFL or SOLO button is pressed anywhere on the console. It provides a very useful indication to the engineer that the normal Monitor output has been replaced by a different signal.

MONO CHECK Switch

This switch sums the left and right halves of any stereo signal to ensure that they are 'mono-compatible'. This applies to whatever has been selected on the monitor selection switches: ie, Replay, mix or a Solo-in-Place.

TIP:

Some stereo signals may have phase problems that do not show up when monitoring in stereo. Summing the left and right signals together is the simplest way of checking that should it ever be required in mono, the signal will be heard correctly. If this is not the case, the phase of one half may have to be inverted.

MONITOR and PHONES Controls

These two level controls affect the signals being sent to the line-level and headphone outputs respectively. Additionally, the line-level output has a MUTE switch, which does not affect the headphone output.

MONITOR TO L-R METERS Switch

To provide visual confirmation that a stereo signal (eg: Replay input) is well-balanced (ie., that the levels of the Left and Right signals are not too different), the signal feeding the L and R master meters may be replaced by the stereo Monitor output. Note that this feed is pre-level-control. Great care should be taken to ensure that this switch is not accidentally left pressed when the MONITOR TO L-R METERS facility is not required. This ensures that the L and R master meters continuously monitor the main mix output, and are not interrupted by solos or selection of other monitor sources.
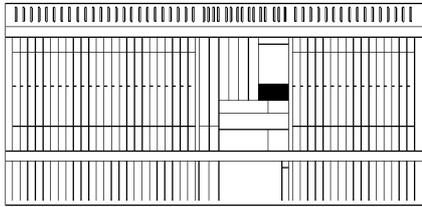
Talkback and Oscillator

Communications are a vital part of a successful production, and the Series Two allows the engineer to access the most important outputs to talk to artists or crew members. An on-board oscillator is also provided to line up any outboard equipment connected to the console.

MIC Connection (Front Panel)

The engineer may use a gooseneck dynamic microphone for talkback; this avoids having to use a full input channel for this purpose.
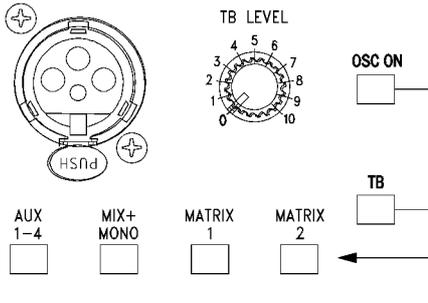
TB Level

The gain of the Talkback mic amp may be varied to match the microphone level.

TB/OSC ON Switches

These switches are used to select whether Talkback or the on-board oscillator is sent to the routing switches. Pressing the momentary TB switch allows the talkback microphone signal to be sent to the busses preselected by the routing switches below. Selecting the OSC ON switch overrides the Talkback microphone, and activates a 1kHz fixed-level tone for line-up purposes.

TB/OSC Routing

Four latching routing switches are provided (AUX 1-4, MIX+MONO, MATRIX 1 and MATRIX 2). These are used to pre select the busses that will receive the Talkback or Oscillator signal.

TIP:

In a typical live setup, Aux 1-4 would be used as pre-fade outputs for on-stage monitoring or foldback. Allocating these aux mixes in this way allows the engineer to talk to the stage using the Talkback routing.
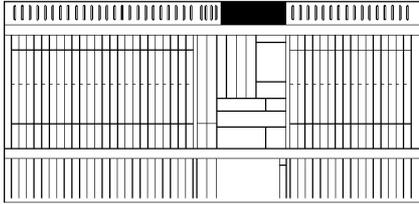
Output Meters

Subgroup Meters

Each subgroup has a dedicated 12-segment LED bargraph meter, which displays the post-fade (post-insert) output level. This enables the engineer to see the actual signal leaving the console, or being fed into the Left/Right/Mono master busses. A reading of '0' corresponds to an output level of +4dBu. The meters have a peak reading response, ie. a very fast attack, but slow decay time.
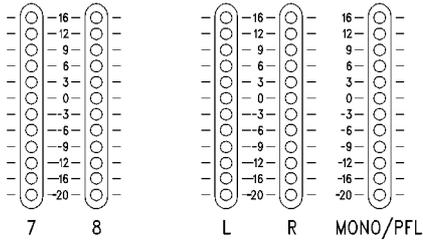
L/R Meters

These meters are normally dedicated to the Left/Right outputs, displaying the post-fade, post-insert level. However, by pressing the MONITOR TO L-R METERS button located in the Monitoring section (see page 4.16), these meters may be re-assigned to show the stereo monitor output.

A reading of '0' corresponds to an output level of +4dBu. The meters have a peak reading response.

MONO/PFL Meter

With no PFL/AFL/SOLO buttons pressed, this meter shows the Mono master output level in the same way as the adjacent Left/Right meters. As soon as any AFL, PFL or SOLO button is activated, the meter switches to show the level of the selected input or output. If this is the case, the PFL/AFL LED on the Monitoring section (see above) will be illuminated.

A reading of '0' corresponds to an output level of +4dBu. The meters have a peak reading response.

TIP:

The top LED of the output meters (labelled '16') represents an output of +20dBu, which is within 4dB of the maximum level. If this LED is frequently lit, the output signal may be 'clipped', which will cause audible distortion, and may also overload whatever equipment is connected to the output. A 'safe' operating level would show a normal signal at around 0, with any occasional peaks not quite reaching the last LED of the meter.
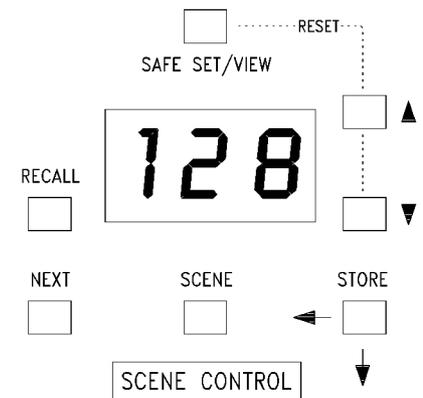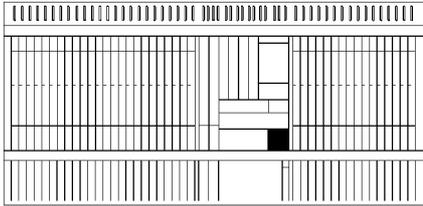
Scene Control

The Series Two benefits from an intuitive automation system that allows the engineer to store and recall up to 128 different 'scenes', comprising console input mutes and MIDI information for the control of external equipment. Each scene may be recalled in sequence, or individually if required. Individual inputs may be set to 'Mute Safe', effectively removing them from the automation system.

In addition to storing scenes, the engineer may set up eight Mute Groups, allowing multiple channels to be muted as required.

Please note that there are several Operating Modes contained within the Series Two operating system. For full details, refer to Appendix A.

TIP:

To those users who are unfamiliar with automation, it is easier to consider a Mute Group as a logical collection of inputs (eg all vocal microphones) that may need to be muted quickly when not in use, and to use the Scene memories to pre-set the console for various key points in the show (such as the beginning of each song).

Connections (Rear Panel)
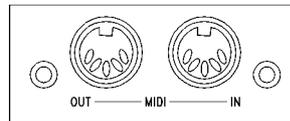
Two MIDI-standard 5-pin DIN sockets are provided, labelled IN and OUT. The Series Two can be connected to other MIDI equipment so that the engineer may use its Scene Control facilities to control outboard processing equipment, playback devices, etc.

The Series Two can accept MIDI Program Changes and Note On/Note Off messages via the IN connector. The OUT connector is used to transmit Program Change messages whenever a Mute Scene is recalled, as well as Note On/Note Off messages that correspond to individual mutes being activated manually.

Storing a Mute Scene

Firstly, switch on the MUTE buttons of the Mono Inputs, Stereo Inputs and Stereo Returns that you require to be muted; then use the ▲ or ▼ buttons to the right of the three-character display to select the memory you wish to use (1 to 128). Press and hold the STORE button then press the SCENE button. This will store the status of the console in the memory indicated by the 3-character display. You will see ' 5 ¡' 5 ヒ' ear briefly as the Mute Scene is stored.

Display

The three-digit LED display shows the scene number, numbered from 1 to 128. If the display is flashing, the number shown has been selected by the ▲/▼ buttons and does not represent the current status of the console.

Returning the Display to the Last Recalled Mute Scene

This is simply achieved by pressing the SCENE button (without pressing STORE). The flashing 3-character display will change to show the last recalled Mute Scene and will cease to flash.

Recalling a Mute Scene

This can be done in one of three ways;

1 The engineer can recall the next consecutive Mute Scene by using the NEXT button,

2 An out-of-sequence Mute Scene is recalled by using the ▲ or ▼ keys to scroll to the correct scene number, followed by the RECALL button,

3 A MIDI Program Change can be sent from an external controller to recall the Mute Scene.

Only one Mute Scene may be recalled at any one time.

TIP:

Though the Series Two uses Mute Scene numbers 1-128, these correspond to MIDI program change numbers 0-127. Remember to offset the Program Change by -1 to access the correct scene.
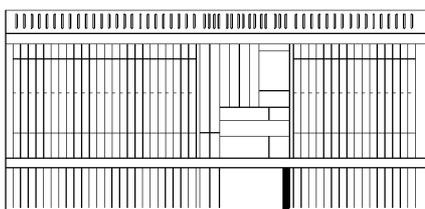
Mute Groups

The Series Two provides the engineer with eight Mute Groups (MUTE 1 to MUTE 8), which are activated by the illuminated buttons adjacent to the MONO master fader.

Storing a Mute Group

Firstly, switch on the MUTE buttons of the Mono Inputs, Stereo Inputs and Stereo Returns that you require to be muted.

Press and hold the STORE button then press the relevant Mute Group button (MUTE 1 to MUTE 8) .

Activating a Mute Group

Mute Groups can be activated at any time, and normally override the Mute Scene settings. Simply press the Mute Group button (MUTE 1 to MUTE 8). The associated LED will illuminate.

TIP:

Unlike Mute Scenes, more than one Mute Group may be active at any time. Arranging the input mutes into logical groups of sources will mean that it is easy for the engineer to mute any unnecessary signals by adding two or more Mute Groups.

SAFE SET/VIEW Button

Each channel may be set to 'Mute Safe' by pressing its MUTE button while the central SAFE SET/VIEW button is held down. In this way, individual channels may be isolated from the Scene Control system; even if they are programmed to mute in a given scene, they will remain under the engineer's control. Simply pressing the SAFE SET/VIEW button will illuminate the MUTE LED of any channel that is currently set to 'Mute Safe'.

TIP:

If you are using one or more input channels for effects returns, it is advisable to set these to 'Mute Safe' - otherwise a reverb effect may be cut short when a new scene is recalled and the return itself is muted. For this reason, the Stereo inputs 1 & 2 and the four stereo returns are set to mute safe as factory default.

MUTE 1

MUTE 2

MUTE 3

MUTE 4

MUTE 5

MUTE 6

MUTE 7

MUTE 8
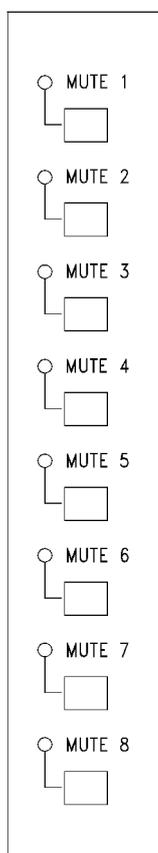
Using the Series Two to Control External Equipment

Each time a MUTE button is pressed, a single MIDI message is sent. This may be Note On or Note Off, depending on the status of the MUTE switch and the setup of the Operating Modes (see Appendix A). The message may be used to start or stop samplers (for effects playback) or to trigger other events that are relevant to the channel. Please refer to Appendix A for more details.

Every Mute Scene also has an associated MIDI Program Change message, which is transmitted every time the Mutes Scene is recalled. This is extremely useful in controlling outboard effects processors (recalling various preset effects as part of a cue) or for triggering playback, lighting cues or any MIDI-controlled events.

It is also possible to use the Series TWO's scene control system purely as a remote effects program controller, without recalling any mute scenes. This is done by selecting operating mode 7 (see Appendix A for details).

Using External Equipment to Control the Series Two

Mutes can be externally controlled either by sending a MIDI Program Change to the Series Two (to recall the associated Mute Scene), or by sending a Note On or Note Off message to change the state of an individual input mute. For a list of Note numbers and their corresponding input mutes, Program Change numbers and MIDI channel information, please refer to Appendix A.

Please refer to Appendix A for details on Operating Modes available as part of the Series Two operating system.

Series TWO

5 Appendices

Appendix A: Scene Control Advanced Information

Operating Modes

The Series Two may be set up by the user to optimise its Scene Control system for a particular application. The user has 8 options as shown below, any of which may be set by the engineer. The factory-set default for each of the Operating Modes is off.

Mode	Function	Description
1	MIDI Receive Off	Stops the console responding to external messages (either Prog Change or Notes)
2	MIDI Transmit Off	Stops the console sending any MIDI messages
3	Program Change Transmit Off	Allows Note On/Note Off to be transmitted but not Prog Changes
4	Mutes as MIDI Note On/Off	See 'Note On/Note Off' below - this selects Sampler Mode when active
5	Scenes override active Mute Groups	Allows a recalled Scene to un-mute channels that were muted as part of a Mute Group
6	Scenes override manual MUTE presses	Allows a recalled Scene to un-mute channels that were muted manually by the engineer
7	Scene recall transmits Program Change only	Recalling a scene has no effect on console mutes; this turns the Scene control system into a controller for external devices only
8	All Automation Off	

Setting an Operating Mode

The engineer can activate any of the above modes by holding down the corresponding Mute Master button (MUTE 1 to MUTE 8) while the console powers up, or while a Processor reset is performed (see Resetting the Console, Page A4). The Mute Master LEDs show which modes are active during power-up.

MUTE/MIDI Note Operation

The default factory setup allows channel Mutes to respond to MIDI Note On messages, with the Velocity determining whether the Mute is on or off. This is known as **Sequencer Mode**, as it resembles that way in which a MIDI sequencer would be used to control the Series Two. A velocity value of '0' is interpreted as 'Mute On'; any other value is seen as 'Mute Off'.

For transmission, pressing a MUTE button to activate the Mute will transmit a Note On message with a velocity of 127 ('7F'); un-muting the channel will send a Note On message with a velocity value of 0 ('00').

Message format:	<Note On> <Console Channel> <Velocity>
For 'Mute On'	<Note On> <Console Channel> <127>
For 'Mute Off'	<Note On> <Console Channel> <0>

Please refer to 'Console Channel/MIDI Note Conversion' below for details of console channel numbers.

The Series Two can be user-set to work in **Sampler Mode**, where Note Off represents a Mute being activated and Note On is equivalent to the channel being unmuted. If used with a sampler, this allows the engineer to trigger samples by simply un-muting the relevant channel - a useful method of integrating effects playback into the console itself. Velocity is set to 127 ('7F') in either case.

MIDI Message format: <Note On/Note Off> <Console Channel>
<Velocity>

For 'Mute On' <Note Off> <Console Channel> <127>

For 'Mute Off' <Note On> <Console Channel> <127>

Console Channel/MIDI Note Conversion

The following table shows how Channel numbers are mapped to MIDI Note numbers:

Console Channel	MIDI Note Number (Hex)	MIDI Note Number (Decimal)
Mono Input 1	00	0
Mono Input 2	01	1
Mono Input 3	02	2
Mono Input 4	03	3
Mono Input 24	17	23
Mono Input 32	1F	31
Mono Input 40	27	39
Stereo Input 1	28	40
Stereo Input 2	29	41
Stereo Return 1	2A	42
Stereo Return 2	2B	43
Stereo Return 3	2C	44
Stereo Return 4	2D	45

Program Change Messages

Unless Operating Modes are set to prevent MIDI transmission, recalling a Scene will send a Program Change message. The format is as follows:

<Prog Change> <Prog Number>

Transmission is on MIDI Channel 16. Program Change numbers are offset by -1 when compared with their associated Scene; Scenes 1 to 128 correspond to Program Changes 0 to 127. The same is true when receiving MIDI Program Changes.

Mute Groups and MIDI

Mute Groups are NOT connected with any MIDI messages.

Backing Up and Restoring a Show

The Series Two will allow a show (multiple Scenes and Mute Group allocations) to be saved off-line by using a MIDI System Exclusive 'Dump Out'. Similarly, a show can be loaded into the console by sending it back a Sys Ex dump.

The Dump Out is initiated by simultaneously pressing the ▲, ▼ and STORE keys. During the Dump Out sequence the normal console operation is suspended (including manual Mute On/Off) and the 3-character display will display 'do'. During Sys Ex reception, the display will display 'dl'. The Sys Ex dump is best stored using Sys Ex librarian software, recorded on a sequencer track, or saved to a MIDI data filer.

Resetting the Console

In the unlikely event of a software failure, the processor can be reset without powering down the console by simultaneously holding down the SAFE SET/VIEW, UP and DOWN keys. This **Processor Reset** will restart the processor, but will not clear either Mute Groups or Scene memories. The Scene Control display and functions will return to their pre-reset states.

If the engineer wishes to clear the console's memories, it is possible to perform a **Hard Reset**, by pressing and holding the NEXT, SCENE and STORE buttons during power-up. This will restore the factory default settings, which are shown below:

| Function	Default State
Mute Groups	All empty, all deselected
Scenes	All Mutes Off, displayed Scene = 1
Safes	All channels not Safe, except Stereo inputs 1&2 and stereo returns 1-4.
Mutes	All Mute Off
Operating Modes	All Off

Software Version

The three-character display will show the software version number for a couple of seconds during power-up. A display showing '_10' refers to Version 1.0.

Appendix B: Cable Wiring Diagrams

INPUTS

Balanced Mic
XLR
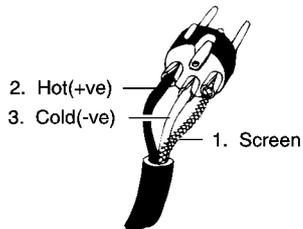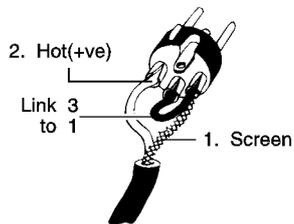
2. Hot(+ve)
3. Cold(-ve)
1. Screen

Unbalanced Mic
XLR

2. Hot(+ve)
Link 3 to 1
1. Screen

Line Inputs

Balanced 3 pole Jack	Unbalanced 3 pole Jack
Hot (+ve)	Signal
Cold (-ve)	Gnd/Screen
Gnd/Screen	Gnd/Screen

Tip
Ring
Sleeve

Inserts

— Signal Return
— Signal Send
— Gnd/Screen

Tip
Ring
Sleeve

Replay In/Rec Out

Signal
Screen

OUTPUTS

Mix Outputs

1. Screen
3. Signal -
2. Signal +

Mix & Group Inserts

— Signal Return
— Signal Send
— Gnd/Screen

Tip
Ring
Sleeve
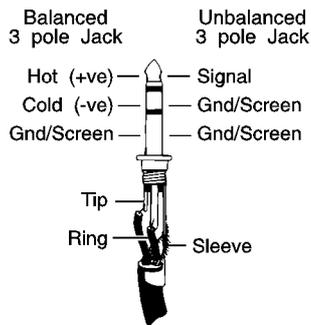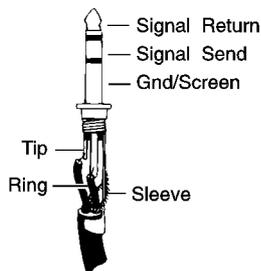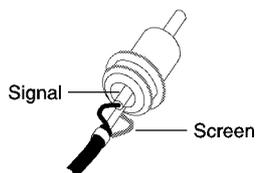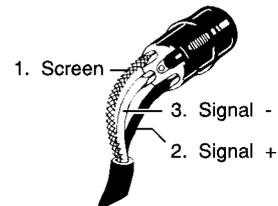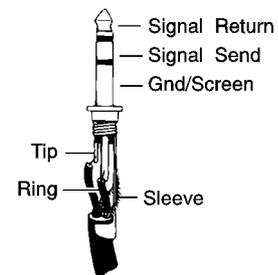
Aux Outputs
Group Outputs
Direct Outputs
Matrix Outputs

—Signal +
—Signal -
— Screen

Headphones

—Left Signal
—Right Signal
— Ground
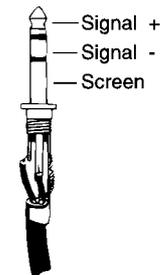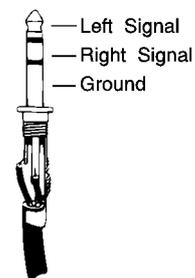
Appendix C: Technical Specifications

| Performance Data	
Frequency Response	XLR input to any output: +0/-0.5dB, 20Hz-20kHz
T.H.D. and Noise	Measured at +4dBu output, 1kHz
	XLR in to Mix Output @ +20dBu: <0.0065%
Mic Input E.I.N	22Hz-22kHz bandwidth, unweighted,
	(200Ω source): <-127dBu
Residual Noise	Mix Output; no inputs routed, Mix fader@0dB: -88dBu
Bus Noise	Mix Output; 40channels routed,
	input faders @ -∞, Mix fader 0dB: -79dBu
	Group Output; 40 channels routed,
	input faders @ -∞, Mix fader 0dB: -80dBu
Crosstalk	1kHz
	Input channel muting: 90dB
	Input fader cutoff: 90dB

| Mono Input EQ and Filter		
High Pass	Freq	40-400Hz
	Slope	12dB/octave
HF	Freq	12kHz
	Gain	+/-15dB
HMID	Freq	550Hz-13kHz
	Gain	+/-15dB
	Q	1.3
LMID	Freq	80Hz -1.9kHz
	Gain	+/-15dB
	Q	1.3
LF	Freq	60Hz
	Gain	+/-15dB

Connections		
Connection	Impedance	Level
Low Impedance Input (XLR)	2kΩ	-60dBu to -15dBu /-40dBu to +5dBu (+27dBu max)
High Impedance Input (jack)	>10kΩ	As low impedance input.
Insert (jack)	Unbalanced send/return 75Ω/10kΩ	0dBu (+22dBu max)
Direct Out (jack)	75Ω Impedance balanced	0dBu (+22dBu max)
Stereo Input/Return (jack)	>10kΩ balanced	+4dBu (+26dBu max)
Replay Input (RCA phono)	>10kΩ unbalanced	-10dBV (+14dBu max)
Record Output (RCA phono)	75Ω unbalanced	-10dBV (+22dBu max)
Group Insert (jack)	Unbalanced send/return 75Ω/10kΩ	0dBu (+22dBu max)
Group Output (jack)	75Ω Impedance balanced	+4dBu (+22dBu max)
Aux Output (jack)	75Ω Impedance balanced	+4dBu (+22dBu max)
Matrix Output (jack)	75Ω Impedance balanced	+4dBu (+22dBu max)
L/R/Mono Insert (jack)	Unbalanced send/return 75Ω/10kΩ	0dBu (+22dBu max)
L/R/Mono Output (XLR)	75Ω balanced	+4dBu (+26dBu max)

Appendix D: Input Equaliser Curves

HF Section

HMF Section

LMF Section

LF Section
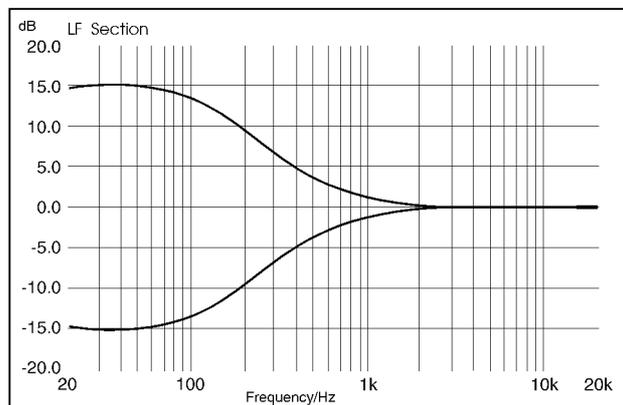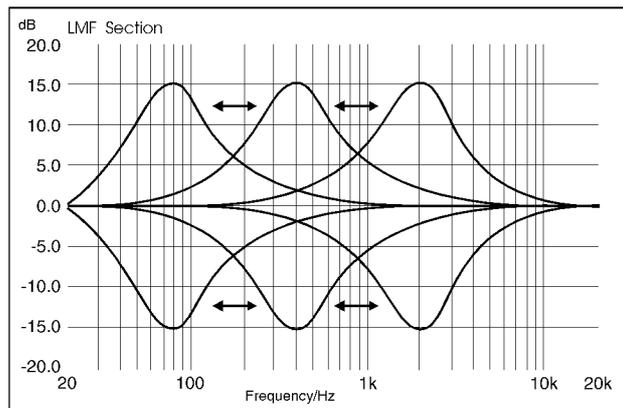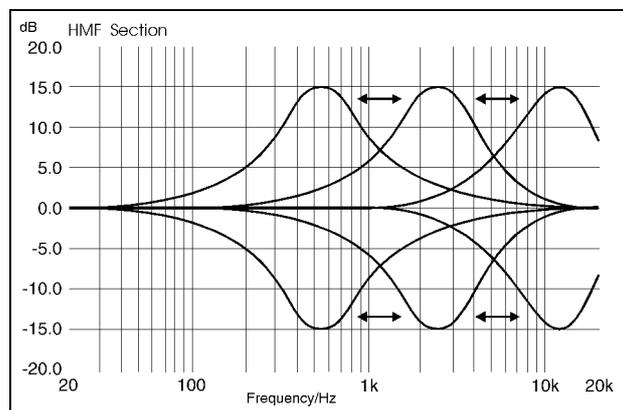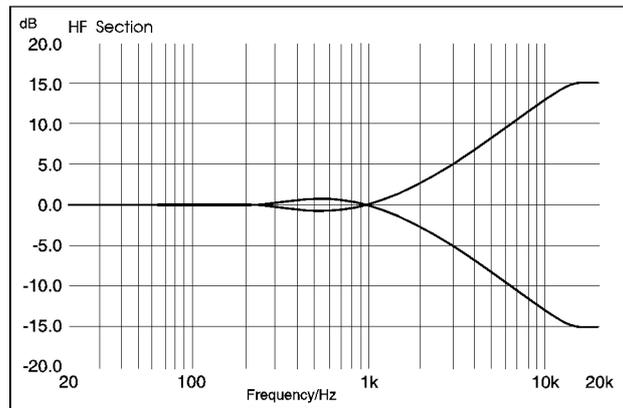
Appendix E: Troubleshooting Guide
. . . .

Correct installation and operation of your Series Two console should result in many years of trouble-free mixing; however, the console is part of a larger and sometimes complex system, which may occasionally present the user with a problem. This section is a guide to the most common system difficulties, and should give the user a few hints on how to avoid their repetition.

An input sounds distorted

Firstly, check the input meter. If the level is constantly lighting up the top LEDs ('12' and '16/PK'), then the input level is too high. Turn down the SENS control until the top LEDs stop illuminating. If the SENS control is already fully counter-clockwise, press the -20 switch to reduce the input gain, and adjust the SENS control again.

An output sounds distorted

Subgroup or Left/Right/Mono master outputs are permanently displayed on dedicated meters, so excessive level should be obvious. In the case of an Aux or Matrix output, press the AFL button for that output to check the level on the PFL/AFL meter. If the top LED on the meter ('16') is constantly illuminated, reduce the output level control.

An input is 'noisy'

Increasing the gain of a low-level input also increases the noise level of the signal; this may be heard as a hiss or even buzz. The console itself is engineered to add no appreciable noise to the signal, so try to adjust the level at the source first (for example, at the guitar amplifier or keyboard output) before adjusting the level at the console. It may be worth checking the cable that connects the source to the input; if one signal core of a balanced pair is broken, the signal level will be reduced and noisy.

Even with the SENS control fully clockwise, there is not enough signal level

This problem is similar to the noisy input; if a source is too quiet, the best way to make up the level is at the source. Check, though, that the -20 switch is not pressed, as this will reduce the maximum gain that you can apply to the signal.

The input signal does not reach the subgroups or master outputs

Apart from checking that the subgroup/master routing switches are set correctly (and that the channel's MUTE is not active), you should check whether the input has an external processor connected to its INSERT point. Disconnect the jack if this is the case; if the signal returns, the processor or insert cable is at fault.

When the system is connected, 'hum' is heard

This can be a complex problem to solve, as hum can be picked up almost anywhere in the system. To isolate the probable cause, mute all the input channels one-by-one and listen to the system. If the hum disappears, the problem is in the source, the input section or the outboard equipment connected to it, in which case each INSERT point should be checked (by removing the jack). If not, turn down the subgroup faders and aux master controls one by one. If the hum persists, remove any jacks from the INSERT points of the Left/Right/Mono outputs, to check whether outboard processing equipment is the cause. If not, pull down the Left/Right/Master faders. If the hum is still present, check the system 'downstream' of the console, especially the mains power connections - often the problem is caused by plugging the console into a different supply from the rest of the system.

DO NOT AT ANYTIME REMOVE MAINS EARTH CONNECTIONS TO GET RID OF UNWANTED HUM.

When the system is connected, radio noise is heard

This is usually the result of an unbalanced connection somewhere in the system. Repeat the sequence above, and when the input or output is identified, swap the connecting cables with a working input or output.

The input fader is at '+10', but there is still not enough level

This is the result of insufficient gain at the input amplifier. Decrease the fader level to '0', then adjust the SENS control so that the input meter shows a normal level. If this makes the input's noise audible, adjust the level at the source (see above). If the input signal is known to be good, but the meter level is low, check that any outboard equipment connected to the INSERT point is not responsible for reducing the signal level.

With the subgroup and master faders at '0', the output is too loud

This is the result of overloading the subgroup mix busses by having the input levels too high. A common reason is that individual fader levels are often increased to boost solos, but are not necessarily reduced by the same amount. This will mean that input faders are approaching the top of their travel (+10dB), requiring the output faders to be pulled back. In this case, reduce the level of every input fader - remembering that this will also affect any post-fade aux sends. If the input faders are more-or-less at the '0' mark, reduce the SENS level of each channel by the same amount to preserve the balance of the mix.

Inputs are routed correctly, but no signal is present at the Left/Right outputs.

Check that the SOLO-IN-PLACE LEDs are not lit - if the ACTIVE LED is illuminated, there is an active SOLO button somewhere on the console that is overriding the normal Left/Right outputs. (This should be obvious due to the illumination of most of the console's mute switches).

A stereo source sounds unnaturally 'thin'

Lack of low frequencies may be a result of one half of the stereo signal being 'phase-inverted' - either by a mis-wired cable, an incorrectly set-up source or by the Ø button on the Mono Input. If the stereo source is connected to two Mono Inputs, press the Ø button of one channel and listen for an improvement in signal quality (this is best done with a full range source like modern music). If the input is connected to a Stereo Input, re-connect to two spare Mono Inputs and repeat the check.

Even with no solo's pressed, there is still a signal at the Monitor outputs

This is a result of selecting MONO, STEREO or REPLAY as the monitor default feed. Select an unused feed (usually REPLAY) or deselect all three source buttons to mute the Monitor output when no SOLO, PFL or AFL buttons are pressed.