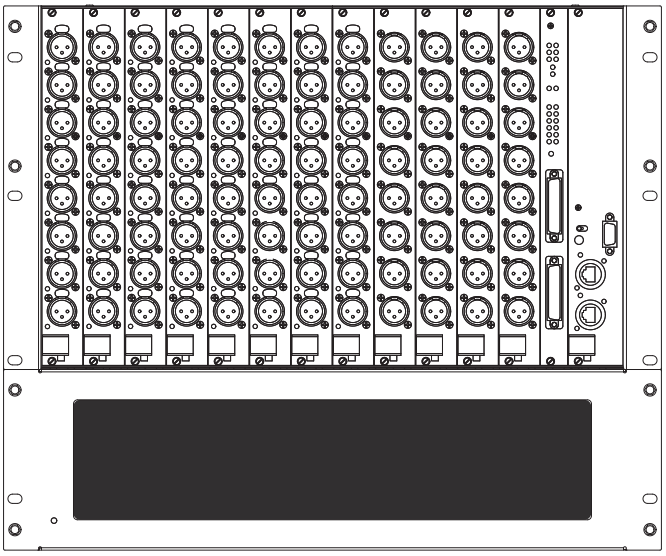
SYSTEM COMPONENTS

SYSTEM HARDWARE OVERVIEW

Stage Box

6U Stage Box

2U Fan Unit

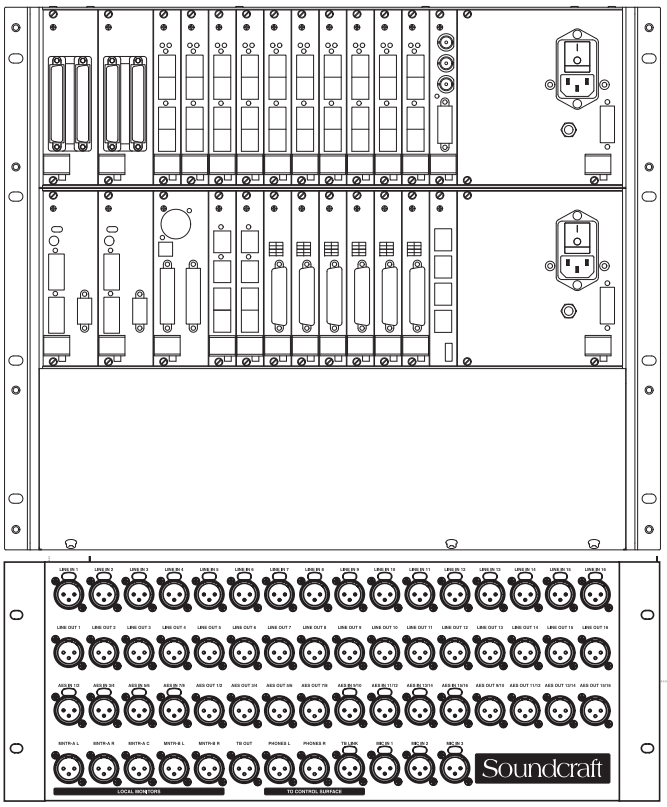


Local Rack

6U Local Rack

3U Fan/Filter Unit

4U Breakout Box



Console Surface

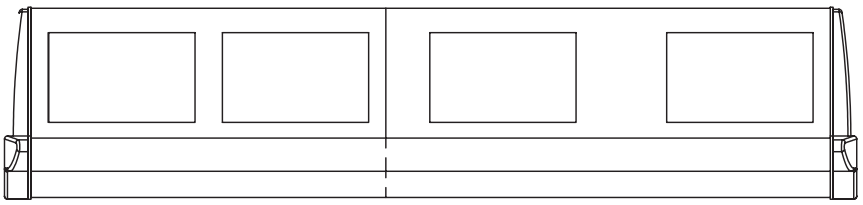


Figure 2-1. The System's Three Component Parts.

NOTE ON INSTALLATION OF THE COOLING FANS/FILTERS

The Stage Box and Local Rack may be ordered already fitted into flight cases, in which case the cooling fans/filters will already be located correctly as shown in the diagrams below.

If the system has been ordered without flightcases, in order that it can be permanently installed, please ensure that the cooling fans/filters are located as shown below.

Local Rack

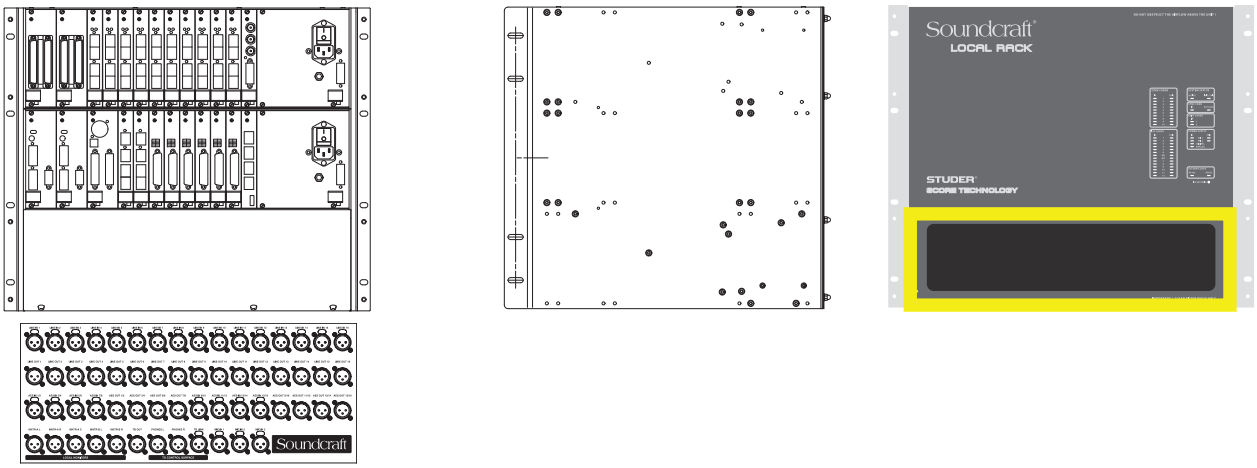


Figure 2-2a: Layout Of Local Rack.

Stage Box

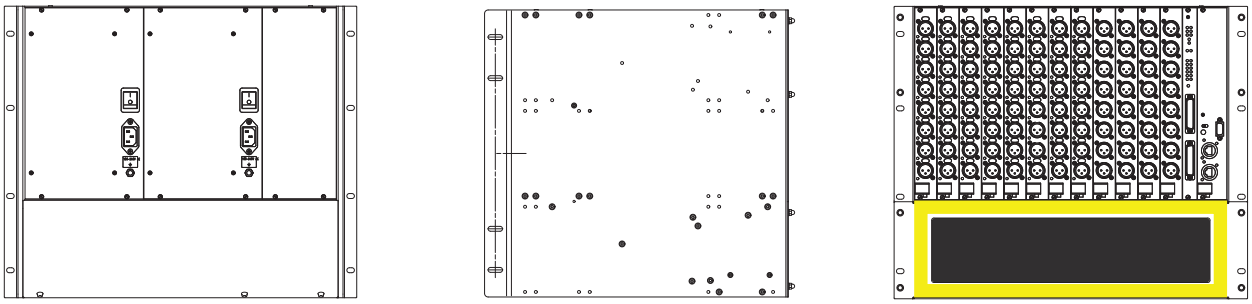


Figure 2-2b: Layout Of Stage Box.

NOTE: Ensure fan units on Local Rack and Stagebox are connected and operational.

CLEAN FILTERS REGULARLY!

The filters are outlined in yellow in the figures above.

THE CONSOLE REAR CONNECTORS

Mains Power Supply Inlet

The mains input is via an IEC connector, with an associated switch, as shown below. This feeds power to the primary PSU.

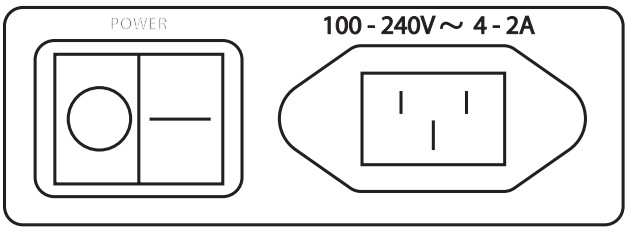


Figure 2-3a: Main Primary Supply Inlet.

An optional redundant primary supply may also be fitted. Its inlet connector is as shown below.

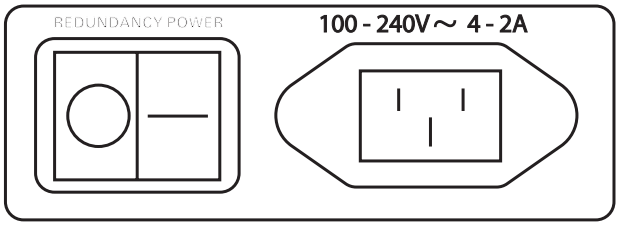


Figure 2-3b: Redundant Primary Supply Inlet.

Audio And Data Rearcon

MIDI Connectors

These are provided by the usual 5-pin DIN connectors.

HiQNet™ Connector

This is an XLR-housed EtherCon connector.

USB Connectors

Use one of these to connect a PC-type keyboard. There is another USB connector on the front panel. A memory stick can be used with either of these two free connectors.

Talkback Mic

This connector is a parallel connection to the front-panel talkback mic connector, and has an associated 48V switch for use if the microphone used requires phantom power.

TB Link, Phones L & R and Control Data

This group of four sockets (3 XLRs and an XLR-housed EtherCon connector) are used to link the console's control surface to the Local Rack. The cable to do this (part number RL0267-01) is supplied with the system. The function of each of the connectors in this cable is marked with a cable sleeve.

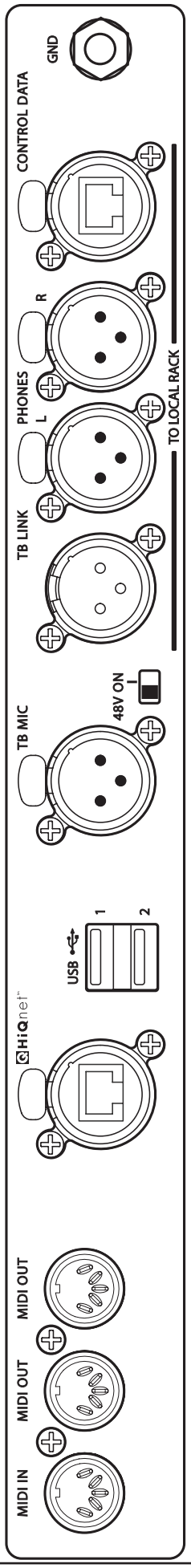


Figure 2-4: Console Rearcon Panel.

LOCAL RACK

Local Rack Description

The Local Rack is the audio 'brain' of the Soundcraft Vi Series™, it contains the DSP mixing processor and the local I/O connections.

The rack consists of a 6U processing and I/O unit, developed by Studer, called the SCore. Below this is a 3U low-noise cooling fan unit. The SCore itself consists of two sections: the upper 3U section houses the DSP mixing core, and the lower 3U section houses the local audio I/O and also the connections to the remote Stage Box.

The audio processing inside the SCore is independent of the control surface. This means that the audio will continue to pass even if the control surface is switched off or disconnected from the core.

How It Works

The control surface sends control data to the Bridge Card, which is a communication and processing hub situated in the centre of the top 3U section of the Local Rack. The Bridge Card interprets the control data and sends internal data to the two DSP Pro cards and the FX Card (when fitted). These cards actually process the audio. The audio input and output connections to the DSP cards are made via 4 short CAT 5 patch cables, which connect the DSP cards with the I/O rack in the lower 3U section of the core.

Front Panel

The front panel contains the Status LED array.

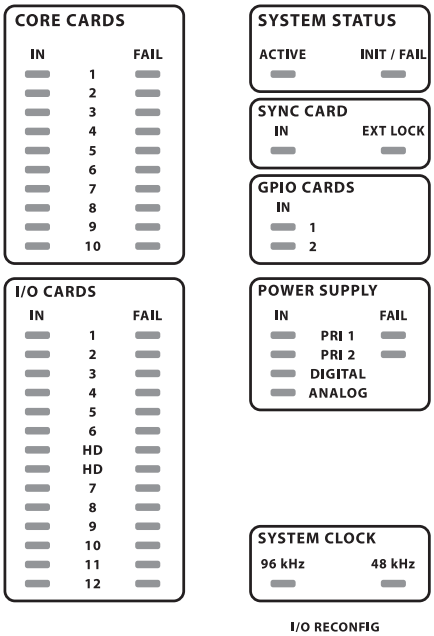


Figure 2-5: Status LEDs.

These LEDs give an at-a-glance indication that the Local Rack is functioning correctly, or that an error condition has occured. An illuminated green LED indicates the presence of a card, an illuminated red LED warns of a card error.

Note that there is a RECONFIG button behind a small hole at the bottom right of the panel. When pressed with a small screwdriver or similar a reset is applied to the lower row of cards in the local rack: this will force a re-polling of the loaded cards to reconfigure the console. This needs to be done only if the card configuration has been changed.

Local Rack Rear

The rear of the Local Rack gives access to the cards in the card frame, and to the XLR breakout box.

Primary Power Supply

The primary power supply connects directly to the IEC inlet and provides a full range ac inlet, converting 100V to 240V ac to 24V dc. The Local Rack can hold up to two power supplies, providing seamless redundancy for those that require it. The rack fan control connection is also provided by one of the power supplies.

XLR Breakout Box

This provides connectors for analogue and AES/EBU audio, and interfaces to the Line In cards, Line Out cards, Mic card and AES/EBU Card within the Local Rack card frame. All the connectors on the Breakout Box are of the XLR type.

It is possible to order the console without this part, in this case the user will have to provide suitable cabling and connectors to interface with the appropriate Local Rack cards. A complete pin list is given later in this chapter.

The Breakout Box connector labelling references are used by the patching system (see chapter 11) when the user wishes to patch the connectors to input channels or output busses.

Audio I/O Cards

The following cards are supported.

1 X Mic/Line Input card providing four electronically balanced Mic/Line Input channels, each with digitally-controlled analogue gain, a 80Hz low-cut filter, and phantom power.
2 X Line Input cards, each providing eight line input channels.
3 X Line Output cards, each providing eight line output channels.
1 X AES I/O card, providing 16 AES input channels and 16 AES output channels.
1 X MADI Stage Box interface card (normally Cat 5, but it can optionally be replaced by an optical MADI card).
1 X Optical MADI card, providing 64 MADI input and 64 MADI output channels.

See page 2-10 for more details.

Local Rack Rear View

The rear view is shown below. Note that the last remaining connector from the console surface (the RJ45 ethernet connector) goes into the top socket on the bridge card.

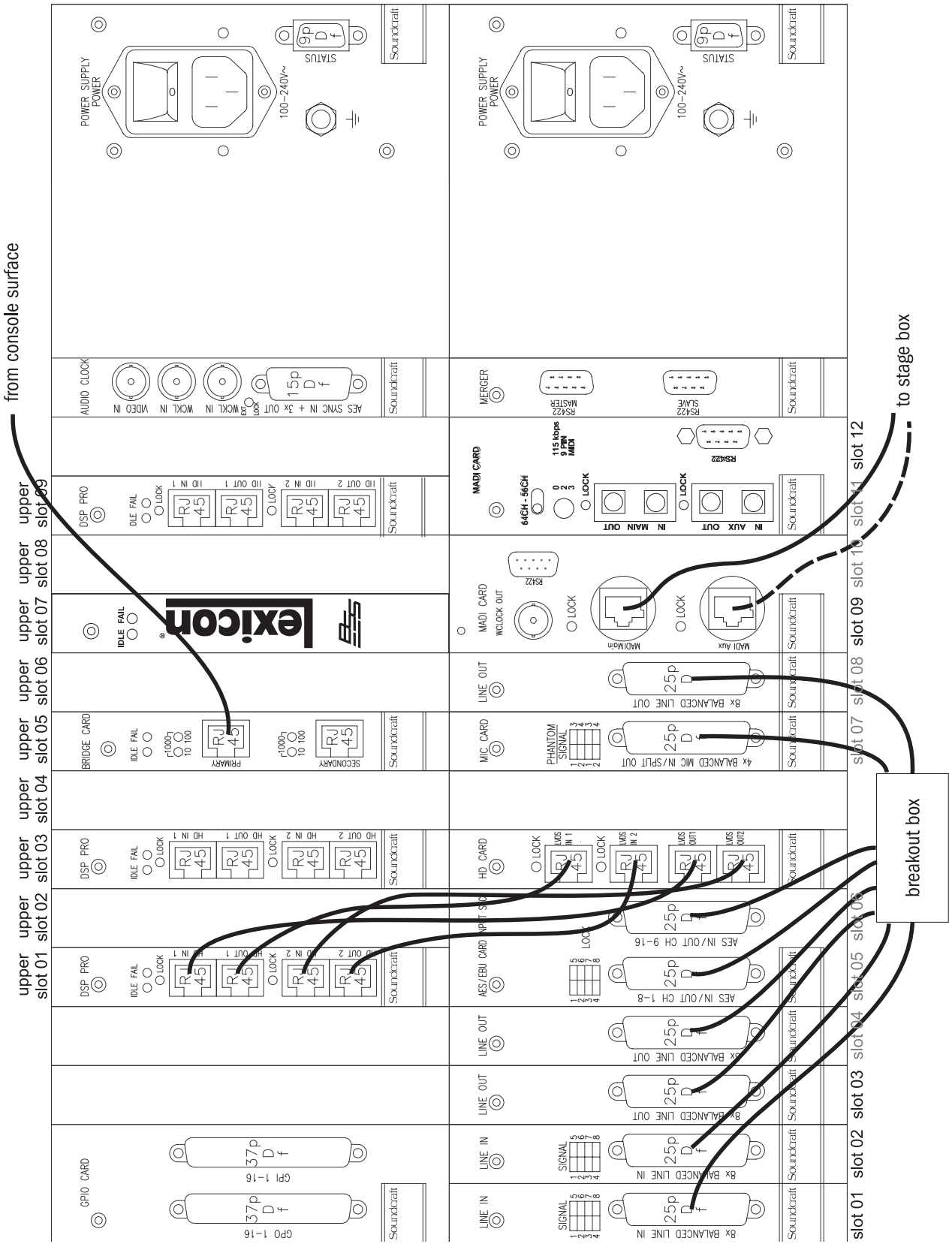


Figure 2-6: Local Rack Rear View.

SLOT 1 LINE INPUTS

Pin	Signal	Pin	Signal
		13	no connection
25	LINE IN 1 screen	12	LINE IN 1 signal-
24	LINE IN 1 signal+	11	LINE IN 2 screen
23	LINE IN 2 signal-	10	LINE IN 2 signal+
22	LINE IN 3 screen	9	LINE IN 3 signal-
21	LINE IN 3 signal+	8	LINE IN 4 screen
20	LINE IN 4 signal-	7	LINE IN 4 signal+
19	LINE IN 5 screen	6	LINE IN 5 signal-
18	LINE IN 5 signal+	5	LINE IN 6 screen
17	LINE IN 6 signal-	4	LINE IN 6 signal+
16	LINE IN 7 screen	3	LINE IN 7 signal-
15	LINE IN 7 signal+	2	LINE IN 8 screen
14	LINE IN 8 signal-	1	LINE IN 8 signal+

SLOT 2 LINE INPUTS

Pin	Signal	Pin	Signal
		13	no connection
25	LINE IN 9 screen	12	LINE IN 9 signal-
24	LINE IN 9 signal+	11	LINE IN 10 screen
23	LINE IN 10 signal-	10	LINE IN 10 signal+
22	LINE IN 11 screen	9	LINE IN 11 signal-
21	LINE IN 11 signal+	8	LINE IN 12 screen
20	LINE IN 12 signal-	7	LINE IN 12 signal+
19	LINE IN 13 screen	6	LINE IN 13 signal-
18	LINE IN 13 signal+	5	LINE IN 14 screen
17	LINE IN 14 signal-	4	LINE IN 14 signal+
16	LINE IN 15 screen	3	LINE IN 15 signal-
15	LINE IN 15 signal+	2	LINE IN 16 screen
14	LINE IN 16 signal-	1	LINE IN 16 signal+

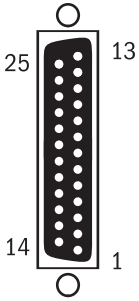
SLOT 3 LINE OUTPUTS

Pin	Signal	Pin	Signal
		13	no connection
25	LINE OUT 1 screen	12	LINE OUT 1 signal-
24	LINE OUT 1 signal+	11	LINE OUT 2 screen
23	LINE OUT 2 signal-	10	LINE OUT 2 signal+
22	LINE OUT 3 screen	9	LINE OUT 3 signal-
21	LINE OUT 3 signal+	8	LINE OUT 4 screen
20	LINE OUT 4 signal-	7	LINE OUT 4 signal+
19	LINE OUT 5 screen	6	LINE OUT 5 signal-
18	LINE OUT 5 signal+	5	LINE OUT 6 screen
17	LINE OUT 6 signal-	4	LINE OUT 6 signal+
16	LINE OUT 7 screen	3	LINE OUT 7 signal-
15	LINE OUT 7 signal+	2	LINE OUT 8 screen
14	LINE OUT 8 signal-	1	LINE OUT 8 signal+

SLOT 4 LINE OUTPUTS

Pin	Signal	Pin	Signal
		13	no connection
25	LINE OUT 9 screen	12	LINE OUT 9 signal-
24	LINE OUT 9 signal+	11	LINE OUT 10 screen
23	LINE OUT 10 signal-	10	LINE OUT 10 signal+
22	LINE OUT 11 screen	9	LINE OUT 11 signal-
21	LINE OUT 11 signal+	8	LINE OUT 12 screen
20	LINE OUT 12 signal-	7	LINE OUT 12 signal+
19	LINE OUT 13 screen	6	LINE OUT 13 signal-
18	LINE OUT 13 signal+	5	LINE OUT 14 screen
17	LINE OUT 14 signal-	4	LINE OUT 14 signal+
16	LINE OUT 15 screen	3	LINE OUT 15 signal-
15	LINE OUT 15 signal+	2	LINE OUT 16 screen
14	LINE OUT 16 signal-	1	LINE OUT 16 signal+

ALL CONNECTORS ARE
25-PIN D-TYPE FEMALE



SLOT 5 AES IN/OUT CHANNELS 1-8

Pin	Signal	Pin	Signal
		13	no connection
25	CH1/2 IN screen	12	CH1/2 IN signal-
24	CH1/2 IN signal+	11	CH3/4 IN screen
23	CH3/4 IN signal-	10	CH3/4 IN signal+
22	CH5/6 IN screen	9	CH5/6 IN signal-
21	CH 5/6 IN signal+	8	CH7/8 IN screen
20	CH7/8 IN signal-	7	CH7/8 IN signal+
19	CH1/2 OUT screen	6	CH1/2 OUT signal-
18	CH1/2 OUT signal+	5	CH3/4 OUT screen
17	CH3/4 OUT signal-	4	CH3/4 OUT signal+
16	CH5/6 OUT screen	3	CH5/6 OUT signal-
15	CH5/6 OUT signal+	2	CH7/8 OUT screen
14	CH7/ 8 OUT signal-	1	CH7/8 OUT signal+

SLOT 6 AES IN/OUT CHANNELS 9-16

Pin	Signal	Pin	Signal
		13	no connection
25	CH9/10 IN screen	12	CH910 IN signal-
24	CH9/10 IN signal+	11	CH11/12 IN screen
23	CH11/12 IN signal-	10	CH11/12 IN signal+
22	CH13/14 IN screen	9	CH13/14 IN signal-
21	CH13/14 IN signal+	8	CH15/16 IN screen
20	CH15/16 IN signal-	7	CH15/16 IN signal+
19	CH9/10 OUT screen	6	CH9/10 OUT signal-
18	CH9/10 OUT signal+	5	CH11/12 OUT screen
17	CH11/12 OUT signal-	4	CH11/12 OUT signal+
16	CH13/14 OUT screen	3	CH13/14 OUT signal-
15	CH13/14 OUT signal+	2	CH15/16 OUT screen
14	CH15/16 OUT signal-	1	CH15/16 OUT signal+

SLOT 7 MIC CARD

Pin	Signal	Pin	Signal
		13	no connection
25	TB LINK screen	12	TB LINK signal-
24	TB LINK signal+	11	MIC IN 1 screen
23	MIC IN 1 signal-	10	MIC IN 1 signal+
22	MIC IN 2 screen	9	MIC IN 2 signal-
21	MIC IN 2 signal+	8	MIC IN 3 screen
20	MIC IN 3 signal-	7	MIC IN 3 signal+
19	not used	6	not used
18	not used	5	not used
17	not used	4	not used
16	not used	3	not used
15	not used	2	not used
14	not used	1	not used

SLOT 8 LINE OUTPUTS

Pin	Signal	Pin	Signal
		13	no connection
25	MNTR A L screen	12	MNTR A L signal-
24	MNTR A L signal+	11	MNTR A R screen
23	MNTR A R signal-	10	MNTR A R signal+
22	MNTR A C screen	9	MNTR A C signal-
21	MNTR A C signal+	8	MNTR B L screen
20	MNTR B L signal-	7	MNTR B L signal+
19	MNTR B R screen	6	MNTR B R signal-
18	MNTR B R signal+	5	TB OUT screen
17	TB OUT signal-	4	TB OUT signal+
16	PHONES L screen	3	PHONES L signal-
15	PHONES L signal+	2	PHONES R screen
14	PHONES R signal-	1	PHONES R signal+

Card Function Overview

The local rack card frame contains the following components.

(Top Row)

GPIO Card with Relay Contacts

Provides a second, independent set of GPIO, which will be controlled by the GPIO page of the Control Surface. The inputs are opto-isolated and the outputs are SPST relay contacts. For a pin-out list see chapter 16.

Bridge Card

Provides the connection from the Local Rack to the Control Surface. Houses a QNX embedded processing system which controls all the audio processing in the rack.

DSP Pro (2 off)

Houses 12 x Hammerhead SHARC chips, which process all audio for the system.

Audio Clock

Provides clock connection to external equipment, both in and out. The wordclock input options are Video clock, standard wordclock or AES/EBU sync clock. Any of these can be used as a wordclock source for the console. The console permanently outputs standard wordclock and AES/EBU wordclock for sync purposes.

(Bottom Row)

Line In

Each card provides 8 x transformer isolated analogue inputs at line level. The card has a signal present indicator for each input. Analogue to digital conversion is handled by a 24 bit ADC.

Line Out

Each card provides 8 x transformer isolated analogue outputs at line level. Card provides 8 x DAC. Clock received from backplane. The 3rd card is used for the analogue monitor outputs, and to send phones L & R to the control surface.

AES/EBU Card Input SRC

Card handles 8 x AES input and 8 x AES output. Inputs are sample rate converted so no external clock is required. Inputs have signal present indication. Sample Rate Conversion (SRC) can be disabled using internal jumpers if required.

HD Card

Communicates with the first DSP Pro on the top row of cards. It passes digital audio along with control data and status information about the cards loaded into the frame. Each pair of links can handle up to 96 channels in both directions. The HD card is responsible for working out what cards are loaded into the system and configuring it accordingly. The RECONFIG button on the front panel of the Local Rack will force a re-polling of the loaded cards to reconfigure the console.

Mic Card

Provides 4 x Mic input for Talkback and local Mic input. The card has 8 indicators, 4 indicators for signal present at the mic input and 4 indicators for the phantom power status.

MADI Card 1

This card is used to connect the Local Rack to the Stagebox. This card passes up to 64 channels of audio in each direction between the stagebox and local rack, normally configured as 64 ins and 32 outs. The card also sends control data to the stagebox, as well as receiving information about the status of the stagebox cards. The second input on the card can be used to increase sample rate to 96kHz (this will also require additional DSP and isn't available yet) or provide redundancy. It also carries clock and control data. The 9-pin D-type connector can carry independent RS422 serial data from local rack to stagebox. Lock LED indicates clock lock between local rack and stagebox. Wordclock output can be used as a W/C source when connecting two consoles to one Stagebox.

MADI Card 2

A second MADI card is fitted to the right of the first card. This second card is used for connection to an external MADI device, such as a MADI recorder, and will always be fitted with optical connectors. It is possible to select either 56ch or 64ch MADI mode, depending on the connected device.

Merger Card

The D-type connectors on this card are not used. This card is used only for internal communications.

Breakout Box

The breakout box provides connections for 16 line inputs, 16 line outputs, 16 AES/EBU input channels, 16 AES/EBU output channels, 5 local monitor outputs, a talkback output, 3 mic inputs, and 3 connectors for the link cable to the control surface.

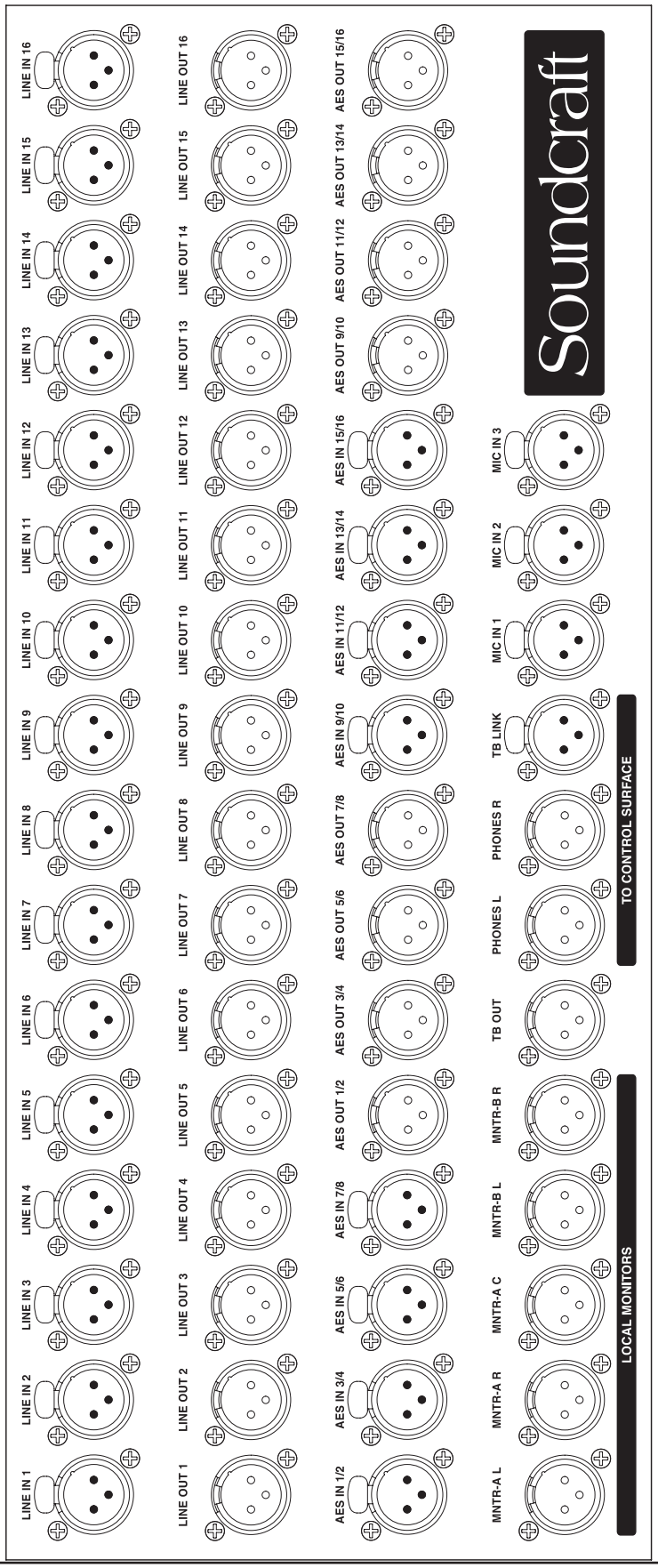


Figure 2-7: XLR Breakout Box.

Cat 5 Breakout Panel

Note that this panel was not fitted to early models.

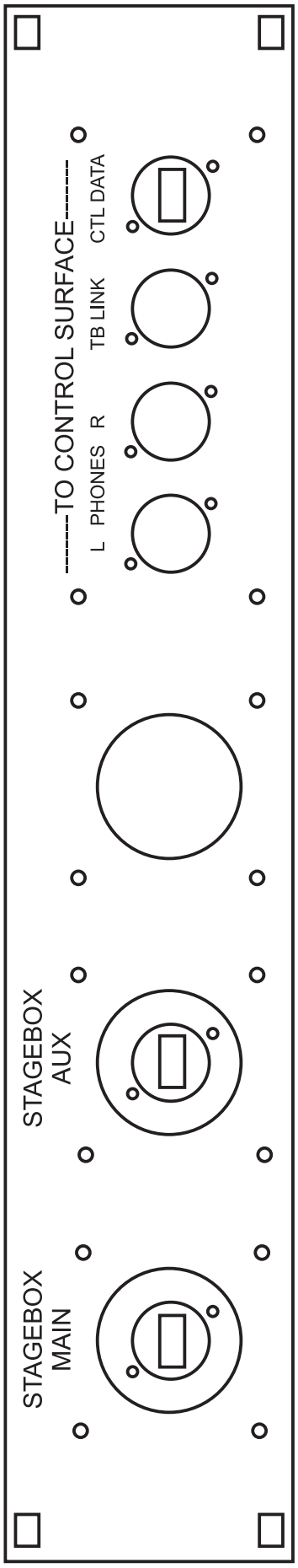


Figure 2-8: Cat 5 Breakout Panel.

STAGE BOX

The Stage Box contains 12 Slots for 6U-high Audio I/O Cards, a GPIO/LED Card and the MADI HD Card which contains the Stage Box-to-Local Rack connection.

Slots are labelled from left to right A-L, and the connectors on the cards are numbered from top to bottom 1-8. These labelling references are used by the patching system (see chapter 11) when the user wishes to patch the connectors to input channels or output busses.

The primary power supplies and the ventilation monitoring connector can be found on the rear panel.

Stage Box Description

Primary power supply
The primary power supply connects directly to the IEC inlet and provides a full range ac inlet, converting 100V to 240V ac to 24V dc. The Stage box can hold up to two power supplies, providing redundancy for those that require it.

Audio I/O Cards
The following cards are supported.

6 X Mic/Line Input cards each providing eight electronically balanced Mic/Line Input channels, each with digitally-controlled analogue gain, a 20dB pad, a 80Hz low-cut filter, and phantom power.
3 X Line Output cards, each providing eight line output channels.
Optional Cards
AES Input card, providing 8 AES input channels (replaces 1 Mic/Line Input card).
AES Output card, providing 8 AES output channels (replaces 1 Mic/Line Output card).

Card Function Overview

Input card
Input cards handle 8 x mic amp, phantom power, pad, analogue low pass filter, phase reverse and A to D. The card has an internal ID, which indicates whether it is input or output and analogue or digital. This means that the system can automatically recognise if the card configuration has been changed.

Output Card
Output cards handle 8 x D to A. The card has a set of relays, which will mute the outputs if the power fails. The module type is identified by the internal ID of the module.

Normally 3 output cards are fitted, giving 24 outputs, however, more cards, up to a maximum of 8 cards giving 64 outputs, can be fitted if input cards are removed.

LED/GPIO/Status card.
Handles GPIO, which is controlled remotely from the Control Surface. The inputs are on opto-isolators and the outputs are open collector transistor outputs. The card also has status indicators for power rails, clock status and IO, and a RECONFIG button which must be pressed if the card configuration has been changed.

MADI HD link card

This card provides audio and control connection with the Local Rack via MADI. The corresponding MADI card in the Local Rack transmits the clock for the Stagebox down the MADI stream. The second input on the card can be used to increase the sample rate to 96KHz, provide a redundant connection to the Local rack or to connect to a second system if two consoles are to be used for a monitor/FOH configuration. The MADI card indicates its clock status using the lock LED on the card. An RS422 link output is also fitted, allowing RS422 data to be transmitted via a 'pipeline' within the MADI stream from a corresponding port on the Local Rack to allow remote RS422 control. This RS422 port can also be used to control the mic preamp gain in the Stagebox if it is in stand-alone mode or digital snake mode.

Redundant MADI Cable Operation

The system can be used with either a single cable connected to the MAIN or AUX ports (usually MAIN), or, for additional security, two cables can be used to provide fully-automatic redundant operation. The 3-position INPUT SEL toggle switch on the Stagebox MADI card determines the mode of operation.



It is very important that this switch is set correctly!

For single cable operation: the switch must be set to either 'MAIN' or 'AUX', depending on which socket is being used.

For dual redundant operation: the switch MUST be set to the 'RED' position.

In redundant mode, the system will automatically switch to the other cable if a fault is detected on one cable. Note that it will then stay on the second cable even if the connection is restored on the first cable. This is to prevent intermittent switching.



NOTE: Do NOT operate with the switch in 'RED' mode when only one cable is being used. Although this may appear to work, audio may not be restored if the cable is temporarily unplugged.

Front Panel

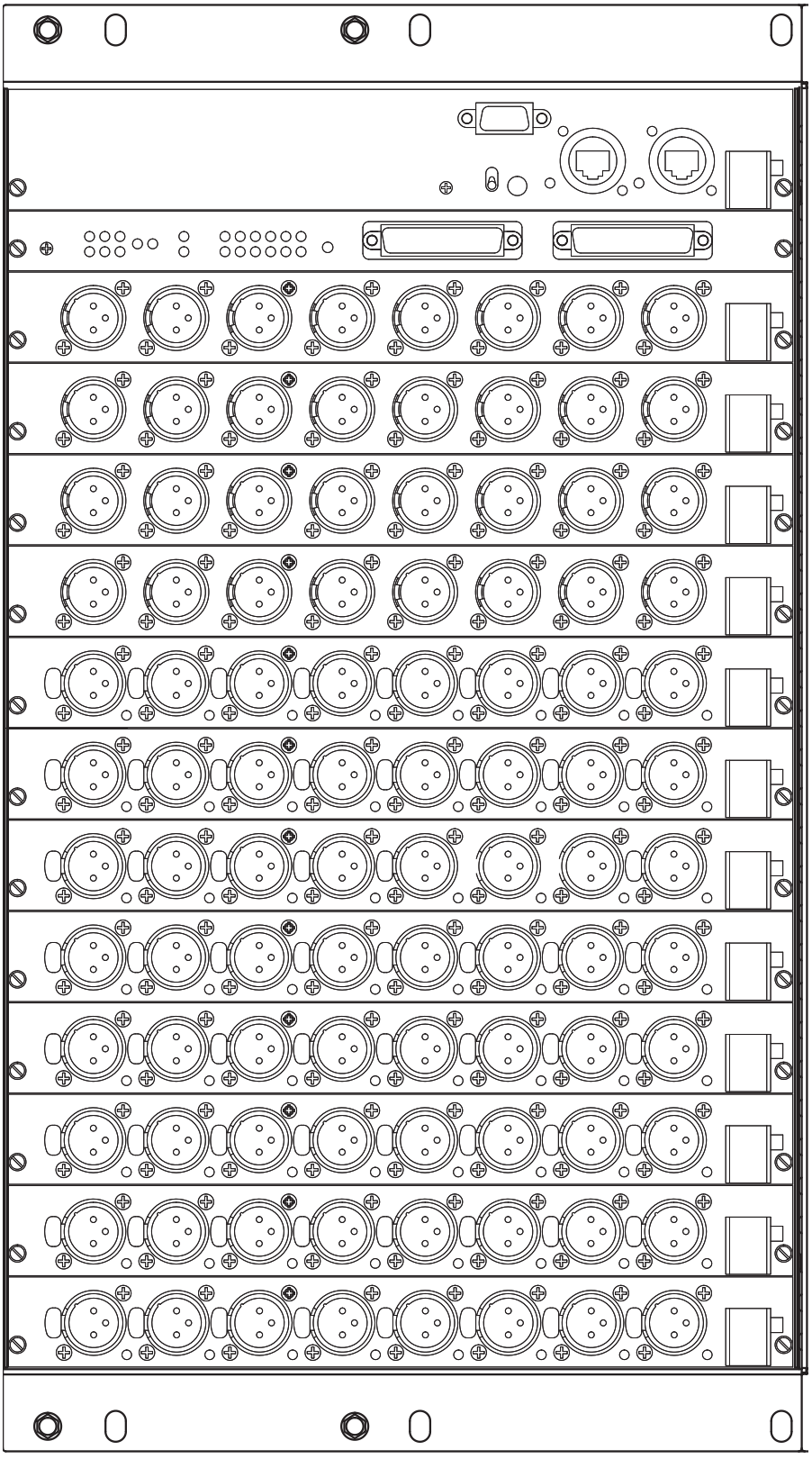


Figure 2-9: Stage Box Front Panel.

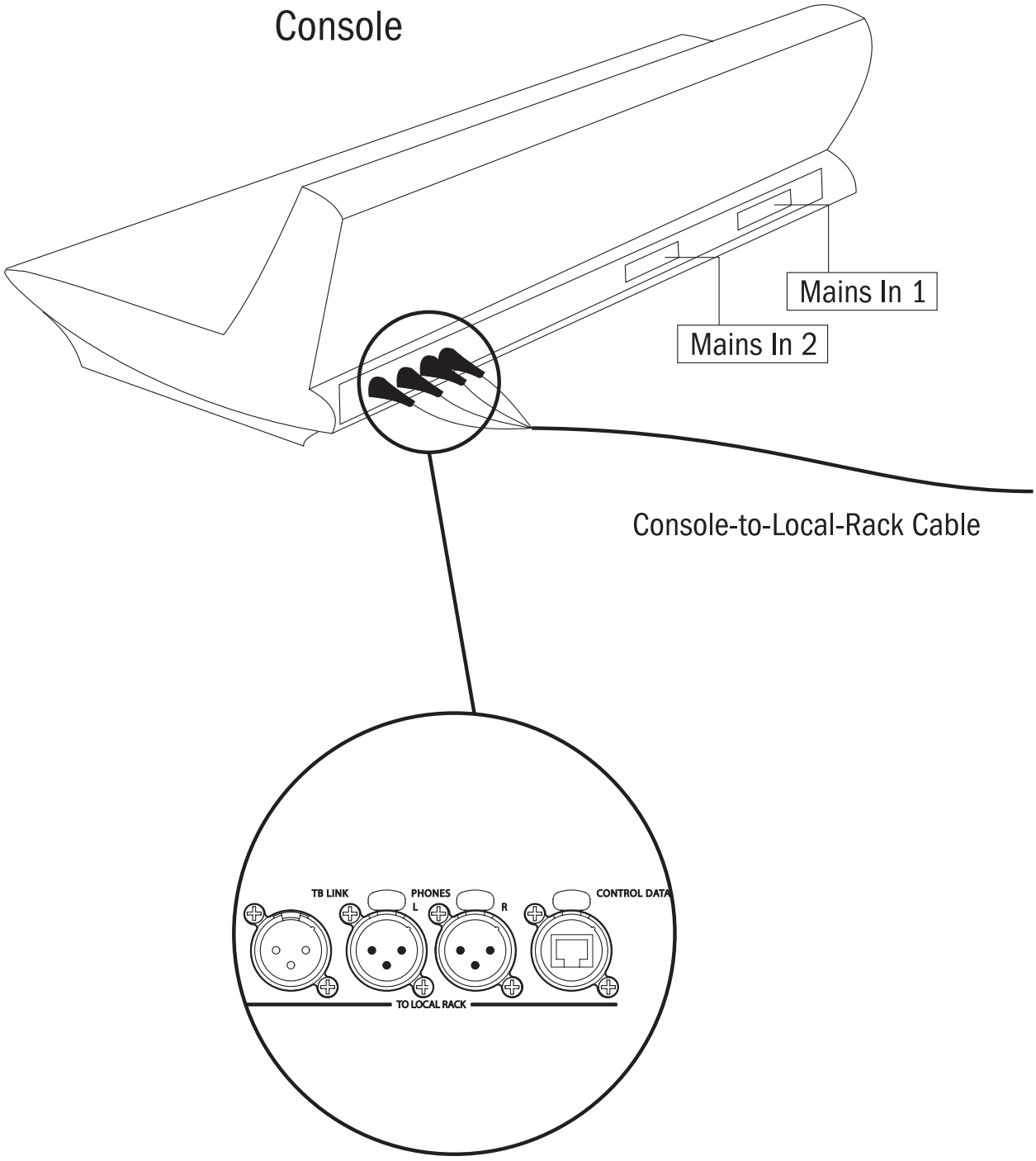
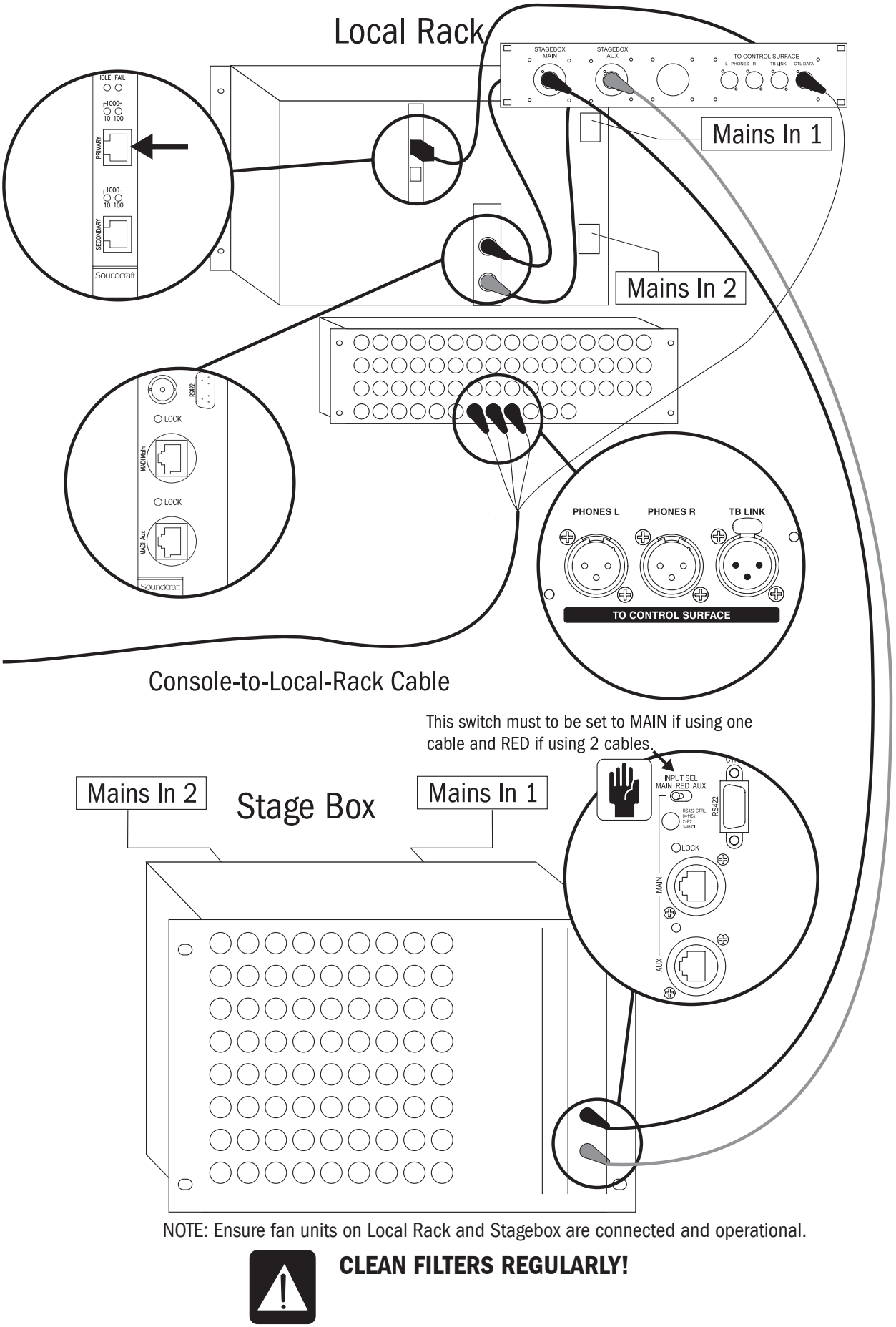


Figure 2-10a: System Interconnections.



NOTE: Ensure fan units on Local Rack and Stagebox are connected and operational.

CLEAN FILTERS REGULARLY!

Figure 2-10b: System Interconnections.