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The SM16 is a 16 bus dedicated monitor console to complement the Vienna and Europa FOH desks.

The key features of the SM16 are:

- 16 mono sends
- stereo send
- individual ON and PRE/POST fade switching on all sends
- 4 programmable mute groups
- 4 band sweep EQ
- linear faders on all inputs and outputs
- sophisticated solo system with autocancel, central global clear and switchable input priority.
- metering for all inputs
- external inputs for all group and stereo mix buses, with level control and solo facility
- balanced inserts on all outputs with bypass switching, and preinsert solo facility

Frame Sizes

The SM16 is available in three frames sizes, 32, 40 and 48 channels. The frames are configured, from left to right:

- inputs 1 - 24
- master
- groups 1 - 8
- inputs 25 - 32 (32 channel)
- inputs 25 - 40 (40 channel)
- inputs 25 - 48 (48 channel)

Power Supplies

All frame sizes will use the CPS900 PSU. Connection to the console is via an 8way and a 16-way SRC connector below inputs 21-24. The SRC panel also carries a ground binding post.

Lamps

Three BNC connectors for lamps are fitted to all frame sizes - one on the master module, and one at either end of the console on the infill panels. These are suitable for Littlite or similar 12V lamps taking up to 330mA each. The voltage supply to the lamps can be varied between 1.5v (dim) and 12v (bright) by the dimmer control, mounted under the armrest in front of the master module.
**Metering**

Each input module has its own bargraph meter in the overbridge. The groups are metered by bargraphs which are next to the faders on the output modules.

The stereo mix/solo metering is by two illuminated VU meters, with integral peak LEDs, in the overbridge above the master module.
Precautions and Safety Instructions

General Precautions
Avoid storing or using the mixing console in conditions of excessive heat or cold, or in positions where it is likely to be subject to vibration, dust or moisture. Do not use any liquids to clean the fascia of the unit: a soft dry brush is ideal. Use only water or ethyl alcohol to clean the trim and scribble strips. Other solvents may cause damage to paint or plastic parts.

Avoid using the console close to strong sources of electromagnetic radiation (e.g. video monitors, highpower electric cabling): this may cause degradation of the audio quality due to induced voltages in connecting leads and chassis. For the same reason, always site the power supply away from the unit.

Caution! In all cases, refer servicing to qualified personnel.

Handling and Transport
The console is supplied in a wooden crate. If it is necessary to move it any distance after installation it is recommended that this packing is used to protect it. Be sure to disconnect all cabling before moving. If the console is to be regularly moved we recommend that it is installed in a foamlined flightcase. At all times avoid applying excessive force to any knobs, switches or connectors.

Power Supplies & cables
Always make sure that the power supply unit (PSU) has been set to the same voltage as the mains supply.

Always use the power supply and cable supplied with the mixer: the use of alternative supplies may cause damage and voids the warranty; the extension of power cables may result in malfunction of the mixing console.

Warning! Always switch the power supply off before connecting or disconnecting the mixer power cable, removing of installing modules, and servicing. In the event of an electrical storm, or large mains voltage fluctuations, immediately switch off the PSU and unplug from the mains.

Always ensure that you use the correct PSU for your mixer. The SM16 uses a CPS900 power supply.
**Signal Levels**

It is important to supply the correct input levels to the console, otherwise signal to noise ratio or distortion performance may be degraded; and in extreme cases, damage to the internal circuitry may result. Likewise, on all balanced inputs avoid sources with large commonmode DC, AC or RF voltages, as these will reduce the available signal range on the inputs. Note that $0\text{dBu} = 0.775\text{V RMS}$.

The microphone inputs are designed for use with balanced low impedance (150 or 200 ohms) microphones.

**Caution!** DO NOT use unbalanced microphones or battery powered condenser microphones without isolating the +48V phantom power: degraded performance or damage to the microphone may result.

The sensitivity of the XLR inputs is variable from -2dBu to -70dBu and +10dBu to -20dBu in two ranges (for +4dBu at the Mix outputs). The maximum input level is +28dBu.

The Hi-Z inputs have a sensitivity variable between +10dBu and -20dBu. The maximum input level is +30dBu.

The main outputs of the console (stereo mix, groups, wedge and mix and group insert sends) are balanced at a nominal level of +4dBu, with a maximum output level of +26dBu.

The input insert sends and direct outputs are ground compensated at a nominal level of -2dBu, with a maximum output level of +20dBu.

All external inputs and mix and group insert returns have a nominal level of +4dBu, and a maximum input level of +26dBu.

Input insert returns have a nominal level of -2dBu, and a maximum input level of +20dBu.
Installation

The SM16 is designed for reliability and high performance, and is built to the highest standards. Whilst great care has been taken to ensure that installations are made as troublefree as possible, care taken at this stage, followed by correct setting up will be rewarded by a long life and reliable operation.

Wiring Considerations

A For optimum performance it is essential for the earthing system to be clean and noisefree, as all signals are referenced to this earth. A central point should be decided on for the main earth point, and all earths should be ‘star-fed’ from this point. It is recommended that an individual earth wire be run from each electrical outlet, back to the system star point to provide a safety earth reference for each piece of equipment.

B Install separate mains outlets for the audio equipment, and feed these independently from any other equipment.

C Avoid locating mains distribution boxes near audio equipment, especially tape recorders, which are very sensitive to electromagnetic fields.

D Where possible ensure that all audio cable screens and signal earths are connected to ground only at their source.

Power Supply (CPS900)

Always ensure that you use the correct PSU for your mixer. The SM16 uses a CPS900 power supply.

Warning! Before switching on your SM16 console, check that the mains voltage selectors on the power supply unit is set to the correct mains voltage for your area, and that the fuse is of the correct rating and type. This is clearly marked on the case of the power supply. Do not replace the fuse with any other type, as this could become a safety hazard and will void the warranty.
Wiring conventions

The SM16 uses two different types of audio connector: 3-pin XLR and $\frac{1}{4}$" 3-pole jacks. The latter are used in several configurations, as shown below.

1/4" ‘A’ Gauge Stereo Jack Plug used as balanced input:
Line inputs, insert returns

- Tip: HOT (IN PHASE SIGNAL)
- Ring: COLD (OUT OF PHASE SIGNAL)
- Sleeve: GROUND (SCREEN)

1/4" ‘A’ Gauge Stereo Jack Plug used as ground compensated output:
Input insert sends, Input direct outputs

- Tip: HOT (SIGNAL)
- Ring: GROUND SENSE
- Sleeve: GROUND (SCREEN)

1/4" ‘A’ Gauge Stereo Jack Plug used as balanced output:
Mix insert sends, Group insert sends

- Tip: HOT
- Ring: COLD (OUT OF PHASE)
- Sleeve: GROUND (SCREEN)

1/4" ‘A’ Gauge Stereo Jack Plug used as stereo output: Headphones

- Tip: LEFT SIGNAL
- Ring: RIGHT SIGNAL
- Sleeve: GROUND (SCREEN)
Input Module
Input Module

Input

1. The sensitivity of both the XLR and the HIGH IMPEDANCE (HI-Z jack) inputs is adjusted by the SENS control. Both inputs are electronically balanced.

XLR input sensitivity: -2dBu to -70dBu, +10dBu to -20dBu (switched range.)

High Impedance input sensitivity: +10dBu to -20dBu

2. When the RNGE (Range) switch is depressed the lower sensitivity range of the input is selected to allow line level signals to be used. The signal is still taken from the input XLR, unless a jack is inserted into the HI-Z input socket, when the signal from that is used instead. Note that when the RNGE switch is released the HI-Z input socket cannot be used.

3. The 48V switch, when depressed, applies 48V phantom power to the input XLR. An integral red LED in the switch indicates when the phantom power is on.

4. The PHASE switch reverses the phase of the selected input.

5. The cutoff frequency of the secondorder highpass filter is varied, between 30Hz and 400Hz, by the FILTER FREQUENCY control. The filter is deactivated completely by an integral switch when the pot is fully anticlockwise.

Frequency Response Curves of the High-Pass Filter

Equaliser

The EQ section is four band: with shelving sweep high and low frequency sections, and two peaking sweep mids with switchable Q.

6. The shelving HF section has a maximum cut or boost of 15dB and the frequency is variable between 1kHz and 20kHz.

7. The peaking HMF (High Mid) section has a maximum cut or boost of 15dB and the frequency is variable between 600Hz and 12kHz.
8 The HMF’s Q is 1.3, and is increased to 2.6 by depressing the HI-Q button.

9 The peaking LMF (Low Mid) section has a maximum cut or boost of 15dB and the frequency is variable between 150Hz and 3kHz.

10 The LMF’s Q is 1.3, and is increased to 2.6 by depressing the HI-Q button.

11 The shelving LF section has a maximum cut or boost of 15dB and the frequency is variable between 20Hz and 400Hz.

12 The EQ section is switched in when the EQ switch is depressed. An integral green LED indicates when the EQ is in circuit.

The Frequency Response Curves of the Equaliser

Input Module
**Insert Point**

The module insert point uses a groundcompensated send and an electronically balanced return, at a nominal level of -2dBu. The signal is accessible via separate 1/4” jacks on the rear connector panel.

The insert point may be set to pre- or post-EQ by pushon jumpers. The factory default is post-EQ.

**Output**

13 The electronically latching PFL switch feeds the pre-fade, pre-mute signal to the PFL bus, which in turn feeds the engineer’s wedge speakers and phones outputs via the Master section. An integral amber LED indicates when the PFL switch is active.

14 The signal in the module is turned on and off by the CUT switch and by the mute buses (see next paragraph).

An integral red LED in the CUT switch indicates when the signal is cut.

15 Each Input module is assigned to the four mute buses via the M1 - M4 buttons. Each switch has an integral red LED, which indicates when the module is assigned to its respective mute bus.

When the module is muted by any of the mute buses, the LED in the CUT switch illuminates.

16 The Post-fader signal level is controlled by a 60mm Fader. The post-fader signal is routed to the Direct Out jack on the rear connector panel: this is a ground compensated output at a nominal level of -2dBu.

The post-fader signal is also fed to the Groups and the Stereo Mix buses (see below).

**Groups**

17 The input signal is sent to the group 1 - 16 buses via individual Level Controls. These have unity gain when fully clockwise, and are activated using the associated ON switches. Each switch has an integral green LED.

18 The group sends are switched pre- or post-fader by the PRE buttons. The pre-fade signal may be sourced from one of the following three options:

- post-mute and pre-fade
- pre-mute
- pre-EQ and pre-insert.

The source selection is done in two blocks of eight sends, using push-on jumpers.

The factory default is post-mute and pre-fade.
**Stereo Mix**

The post-fader signal is sent to the stereo mix bus via the **L/R** (level) and **PAN** controls. The PAN control gives a 4.5dB centre drop. The mix bus send is activated by the **ON** switch, which has an integral green LED, and may be set pre- or post-fade by the **PRE** switch. The pre-fade signal may be sourced from one of the following three options:

- post-mute and pre-fade
- pre-mute
- pre-EQ and pre-insert

The source selection is done using push-on jumpers.

The factory default is post-mute and pre-fade.

**Metering**

The red **PEAK** LED illuminates when the signal level exceeds +14dBu (internal) at the output of the input amp, the insert return, the output of the EQ or the post-fader amplifier.

A 16-segment peak-reading bargraph meter in the overbridge meters the signal directly after the input amplifier. The meter has a peak-reading ballistic characteristic.

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### Jumper Options

*RH PCB*

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<th>Options</th>
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<td>J2, J4, J5</td>
<td>jumpers IN for pre-EQ</td>
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</tr>
<tr>
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<td>post-mute</td>
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<tr>
<td>J14</td>
<td>jumper IN for pre-EQ &amp; pre-insert</td>
<td></td>
</tr>
<tr>
<td>J15</td>
<td>jumper IN for pre-mute</td>
<td></td>
</tr>
<tr>
<td>J13</td>
<td>jumper IN for post-mute &amp; pre-fade</td>
<td></td>
</tr>
</tbody>
</table>

Note: only one of the above three jumpers to be fitted at any one time.

| Group 9-16 Pre-fade signal  | post-mute |
| J11                          | jumper IN for pre-EQ & pre-insert |           |
| J10                          | jumper IN for pre-mute           |           |
| J12                          | jumper IN for post-mute & pre-fade |           |

Note: only one of the above three jumpers to be fitted at any one time.

| Mix L-R Pre-fade signal     | post-mute |
| J8                           | jumper IN for pre-EQ & pre-insert |           |
| J9                           | jumper IN for pre-mute            |           |
| J7                           | jumper IN for post-mute & pre-fade |           |

Note: only one of the above three jumpers to be fitted at any one time.
**Input and Output Levels**

**XLR INPUT (electronically balanced)**
- Sensitivity: -2dBu to -70dBu, +10dBu to 20dBu
- Maximum Input Level: +28dBu
- Input Impedance: 2KΩ

**HI-Z INPUT (electronically balanced)**
- Sensitivity: +10dBu to -20dBu
- Maximum i/p level: +30dBu
- Input Impedance: >10KΩ balanced

**INSERT SEND (ground compensated)**
- Nominal Level: -2dBu
- Maximum Output Level: +20dBu into 2kΩ
- Output Impedance: <75Ω

**INSERT RETURN (electronically balanced)**
- Sensitivity: -2dBu
- Maximum I/P Level: +20dBu
- Input Impedance: >10KΩ balanced

**DIRECT OUTPUT (ground compensated)**
- Nominal Level: -2dBu
- Maximum Output Level: +20dBu into 2kΩ
- Output Impedance: <75Ω
Rear Connectors

**INPUT (3 pin female XLR)**
- Pin 1: Ground
- Pin 2: Signal (Hot)
- Pin 3: Signal (Cold)

**HI-Z INPUT, INSERT RETURN (1/4" 3-pole Jack)**
- Tip: Signal (Hot)
- Ring: Signal (Cold)
- Sleeve: Ground

**DIRECT OUTPUT, INSERT SEND, (1/4" 3-pole Jack)**
- Tip: Signal
- Ring: Ground Sense
- Sleeve: Ground
Group Output Module
Eight output modules are fitted in each console. The output module contains two group output sections, stacked one above the other. The lower sections control groups 1 - 8, while the upper sections control groups 9 - 16. The two sections have identical facilities.

**Level Control**

The group summing amp is assigned to one of the sixteen group buses using internal 0.1" push-on jumpers.

1. The 100mm **Fader** controls the level of the signal from the summing amplifier, which is fed to the insert send, with 10dB of gain at maximum.

**Insert Point**

2. The insert point is post-fade, and uses an electronically balanced send and return at a nominal level of +4dBu. The insert SEND and RETURN are on separate 1/4" jacks on the rear connector panel. The insert point may be bypassed using the **INSERT OUT** switch. An integral red LED indicates when the insert point is bypassed. Note that the send is always active.

**Solo**

3. The electronically latching **AFL** switch, which has an integral amber LED, feeds the post-fade, post-insert group signal to the engineer’s wedge speakers and phones output; however, if INPUT PRIORITY (see the Master Module) is enabled then any active input PFLs will replace the AFL signal, and the group will not be heard until the inputs are un-PFLed. If solo AUTO CANCEL (see the Master Module) is selected, then the AFL will cancel any other active PFLs or AFLs. The AFL may also be cleared with the Master Module’s SOLO CLEAR function.

4. The **PRE INSERT** switch moves the AFL signal before the insert point.

5. The **AFL TRIM** pot gives +/-10dB of level adjustment.

**Cut**

6. The **CUT** switch mutes the signal to the group output and stereo mix bus (if selected). The switch has an integral red LED which indicates when the signal is cut.

**Stereo Mix**

7. The **L** and **R** switches route the group signal to the left and right stereo mix buses respectively. Each switch has an integral green LED. This feature allows subgroups to be created, if the console is used in a FOH application.
**Talkback**

8 The momentary TB switch feeds the signal from the TALKBACK MICROPHONE to the group output; it is independent of the Fader position and the CUT switch. The group output is dimmed by 6db, and the engineer’s wedge speaker is dimmed by 20dB while the TB switch is active.

Talkback may also be routed to all the group buses simultaneously by the INT talkback function on the master module; in this case the group CUT and fader will affect the talkback level.

**Output Phase**

9 The PHASE switch, which has an integral red LED, reverses the phase of the group output. The group output itself is electronically balanced at +4dBu, on a male XLR on the rearcon.

**Metering**

10 The group output level is metered by an integral peakreading **16-segment LED bargraph** which is situated next to the Fader; the meter is calibrated for 0 at +4dBu output. An internal jumper allows the meter response to be set to average-reading instead of peak-reading.

**External Input**

An external input, from an XLR on the lower rearcon, may be added to the group bus. The input is balanced with a sensitivity of +4dBu.

11 The EXT IN control adjusts the level of the external signal to the group, it provides a maximum 10dB gain when it is fully clockwise.

12 The latching ON switch activates the external input. An integral green LED indicates when it is on.

13 The latching LSTN (Listen) switch, which has an integral amber LED, provides a pre-fade, pre-ON solo to the ‘phones or wedge output. LISTEN is not affected by the AUTO CANCEL or SOLO CLEAR functions, and overrides any output AFLs if INPUT PRIORITY is active.
### Jumper Options

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<th>Options</th>
<th>Default</th>
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<td>J1 - J8 Group 1 - 8</td>
<td>According to Module Position</td>
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<tr>
<td><strong>Upper group bus programming</strong></td>
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<td>According to Module Position</td>
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<td><strong>Lower Meter Response</strong></td>
<td>J17 Peak or Average</td>
<td>Peak</td>
</tr>
<tr>
<td><strong>Upper Meter Response</strong></td>
<td>J18 Peak or Average</td>
<td>Peak</td>
</tr>
</tbody>
</table>

### Input and Output Levels

**Insert Sends, Group Outputs (electronically balanced)**

- Nominal level: +4dBu
- Maximum output level: +26dBu into 600Ω
- Output impedance: <75Ω

**Insert Returns, External Inputs (electronically balanced)**

- Sensitivity: +4dBu
- Maximum i/p level: +26dBu
- Input impedance: >10KΩ balanced
**Rear Connectors**

*External Inputs (3-pin female XLR)*
- Pin 1: Ground
- Pin 2: Signal (Hot)
- Pin 3: Signal (Cold)

*Insert Return (1/4" 3pole Jack)*
- Tip: Signal (Hot)
- Ring: Signal (Cold)
- Sleeve: Ground

*Insert Send, (1/4" 3pole Jack)*
- Tip: Signal (Hot)
- Ring: Signal (Cold)
- Sleeve: Ground

*Group Outputs, (3 pin male XLR)*
- Pin 1: Ground
- Pin 2: Signal (Hot)
- Pin 3: Signal (Cold)
The master module contains the stereo mix or sidefill output, the operator’s headphones and wedge speaker outputs, a noise or sine wave test oscillator, the solo mode controls and master solo clear function, and internal/external talkback functions.

**Stereo Mix**

The stereo mix path duplicates the facilities of the group outputs, in stereo.

1. The 100mm stereo mix Fader controls the level of the signal from the summing amplifiers. This stereo signal is fed to the left and right insert sends, with 10dB of gain at the maximum.

**Insert Point**

The inserts are postfade, using electronically balanced sends and returns at a nominal level of +4dBu. The insert SENDs and RETURNs are on separate 1/4” jacks on the rear connector panel.

2. Both left and right inserts may be bypassed using the INSERT OUT switch. An integral red LED indicates when the insert point is by-passed. Note that the sends are always active.

3. The electronically latching AFL switch, which has an integral amber LED, feeds the stereo post-fade, post-insert signal to the engineer’s wedge speakers and phones output.

4. If INPUT PRIORITY is enabled, then pressing any input PFL while AFL is also active, will replace the AFL, which will not be heard until the inputs are un-PFLed.

5. If solo AUTO CANCEL is enabled on the master module, then the AFL will cancel any other active PFLs or AFLs.

6. The AFL may also be cleared with the master SOLO CLEAR momentary action switch. The SOLO CLEAR button illuminates when any AFL, PFL or LISTEN is active.

7. The PRE INSERT switch moves the AFL signal before the insert point

8. The AFL TRIM pot gives +/-10dB of level adjustment.

**Cut**

9. The CUT switch mutes the signal to the left and right outputs. The switch has an integral red LED which indicates when the signal is cut.
Output Phase

10 The PHASE switch, which has an integral red LED, reverses the phase of both left and right outputs. The outputs themselves are electronically balanced at +4dBu, on male XLRs on the rearcon.

External Input

11 A stereo external input, from XLRs on the lower rearcon, may be added to the mix buses. The inputs are balanced with a sensitivity of +4dBu. The EXT IN control adjusts the level of the external signals, with 10dB of gain fully clockwise.

12 The MNO (mono) switch sums the external signal to mono before it is fed to the stereo mix.

13 The latching ON switch activates the external input. An integral green LED indicates when it is on.

14 The LSTN (listen) provides a mono pre-fade, pre-ON solo to the 'phones or wedge output. LISTEN is not affected by the AUTO CANCEL or SOLO CLEAR functions, and overrides any output AFLs if INPUT PRIORITY is active.

Using the Solo System

A solo system of pre-fade listen (inputs) and post-fade listen (outputs) feeds the operator’s wedge/phones outputs.

Normally, all active AFL, PFL and LISTEN signals are summed together and fed to the wedge or phones outputs.

When INPUT PRIORITY is selected by the ENBL switch, which has an integral red LED, an active PFL or LISTEN will replace any AFL signals, which will be audible only when all the PFL/LISTENs are released.

15 The PFL TRIM control gives +/-10dB of level trim for PFL/LISTEN signals.

The SOLO CLEAR button lights when any AFL, PFL or LISTEN is active. Pressing it will clear a PFL or AFL, but not a LISTEN.

When AUTO CANCEL is activated by the ENBL button, which has an integral red LED, any AFL or PFL will cancel any currently active solo, so only one AFL or PFL can be active at once.

LISTEN buttons are not affected.
**External Solo Signals**

The PFL, AFL Left and AFL Right external inputs, from XLRs on the lower rearcon, allow signals from another console to be added to the PFL and AFL buses. The external PFL level is trimmed by the PFL TRIM pot. When no solos are active on the console, both PFL and AFL left and right external signals are monitored by the 'phones and wedge. When INPUT PRIORITY is not active, the external signals are mixed with any current internal PFL, AFL or LISTEN signals; if INPUT PRIORITY is enabled and a PFL/LISTEN is active then the external AFL input is cut.

Internal jumpers allow the signal fed to the 'phones/wedge when no solos are active to be changed from the external PFL/AFL signals (as described above) to the stereo mix postfade signal. This will be replaced by any active solo signal. To monitor the external PFL/AFL inputs in this case, a solo on the console must be pressed.

**PFL and AFL Outputs**

The PFL, AFL left and AFL right output signals are available on XLRs on the rear connector panel, ground compensated at +4dBu. These are for use when linking the console (as a slave), or for additional monitoring.

**Metering**

The current solo signal is metered by two VU meters in the overbridge; the AFL signal from the stereo mix is displayed in stereo while mono AFLs (from the groups) and PFL/LISTEN signals (taken after the PFL trim pot) are fed to both left and right meters.

**Wedge and Headphones Outputs**

The wedge (operator’s speaker) and headphones outputs share a common signal source: when no PFL, AFL or LISTENs are active, then the source is either the external PFL and AFL inputs, or the stereo mix signal, according to internal jumper settings.

When a solo is active the signal is the console AFL or PFL signal, summed with the external PFL and AFL signals as described in the previous section.

16 The headphones output level is adjusted by the PHONES control; the output is available on a 1/4” 3-pole jack under the armrest, duplicated on the rear panel.

17 The stereo wedge output level is controlled by the 100mm wedge Fader and is balanced at +4dBu on XLRs.

18 When the L switch is depressed, the Left signal is fed to both Left & Right Wedge outputs. Similarly, when the R switch is depressed, the Right signal is fed to both Wedge outputs. When the L and R buttons are both depressed, a mono mix of the Left and Right signals is fed to both Wedge outputs.
**Talkback**

The talkback system allows communication by the operator to the group and mix outputs, and to and from the front of house (FOH) console.

19 The **TALKBACK** control adjusts the level of the talkback mic input, from a 3-pin XLR on the rear panel. The sensitivity of the mic input is variable between -20dBu and -50dBu.

20 The momentary action **FOH** button, which has an integral green LED, initiates talkback to the front of house console using a Soundcraft proprietary system. The talkback mic signal is switched to the FOH OUT XLR, with a +15v DC common-mode voltage to signal the FOH console (a Vienna, Europa or 8000) that talkback is occurring. The signal present on the FOH IN XLR is fed to the 'phones, dimming the existing signal by 15dB. The wedge is dimmed by 20dB. An internal jumper disables the common-mode DC voltage, to allow use with non-Soundcraft desks.

If a 15v common-mode voltage is detected on the FOH IN XLR, indicating talkback from the front-of-house console, then the FOH IN signal is switched to the 'phones output, dimming the existing signal by 15dB, and dimming wedge output by 20dB. The FOH switch also lights. The signal from the talkback mic may be routed to the group or mix outputs individually by pressing the **TB** button on each output; this also dims the wedge output by 20dB.

21 The momentary **TB** switch feeds the signal from the TALKBACK MIC to the mix outputs independently of the fader and CUT switch, dimming the output by 6dB while it is active.

22 Talkback may also be routed to the mix buses by the **INT** talkback function on the master module; in this case the mix CUT and fader will affect the talkback level. The **TALKBACK TO BUSES INT** button, which has an integral green LED, routes the talkback signal from the mic to all group and mix buses simultaneously, also dimming the wedge output.

23 The **TALKBACK TO BUSES EXT** button, which has an integral green LED, sends the FOH IN signal to the group and mix buses when FOH talkback is active to allow the front-of-house engineer to talk to the performers via the monitor outputs.

**Oscillator**

24 The oscillator, activated by the **ON** switch, produces pink noise. An integral red LED in the switch indicates when the oscillator is on.

25 The **TONE** button switches the signal from pink noise to sine wave. An integral red LED in the switch indicates when the Tone is on.

26 The TONE’s frequency is variable between 63Hz and 1kHz; it is adjusted by the **FREQ** control.

27 The **X10** button, which has an integral red LED, increases the frequency up to 630Hz and 10kHz.

28 The oscillator signal is fed to the group and stereo mix buses; the oscillator output is also available, balanced at a nominal level of +4dBu, on an XLR on the rear connector panel. The **LEVEL** control adjusts the level from off to 10dB above nominal.
Mute Masters

29 The four, latching, Mute Master buttons M1 - 4, which each have an integral red LED, control the four mute buses. Any inputs assigned to a mute bus will be cut by the appropriate mute master.

PSU Status Indicators

30 The three PSU Status Indicator LEDs (red) show that the PSU rails +/-17v (both sets of rails), +24v and +48v are working.

Lamp

31 The LAMP BNC socket allows connection of a gooseneck lamp. The voltage is variable from 1.5v to 12v by the DIMMER control under the armrest. Maximum current is 330mA, suiting 12V HI-INTENSITY Littlites, or similar.

Jumper Options

<table>
<thead>
<tr>
<th>Function</th>
<th>Options</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>FOH Out DC Voltage</td>
<td>JMP4 Enabled or disabled</td>
<td>Enabled (jumper in)</td>
</tr>
<tr>
<td>Phones/Wedge Signal</td>
<td>J3 jumper in for Stereo Mix</td>
<td>Ext. PFL/AFL</td>
</tr>
<tr>
<td></td>
<td>J4 jumper in for Ext. AFL/PFL</td>
<td></td>
</tr>
</tbody>
</table>

Input and Output Levels

INSERT SENDS, MIX, WEDGE AND FOH TALKBACK OUTPUTS (Electronically Balanced)

nominal level +4dBu
maximum output level +26dBu into 600Ω
output impedance <75Ω

OSCILLATOR OUTPUT (Electronically Balanced)

nominal level +4dBu
maximum output level +14dBu into 600Ω
output impedance <75Ω

PFL, AFL LEFT AND RIGHT OUTPUTS (Ground Compensated)

nominal level +4dBu
maximum output level +20dBu into 2kΩ
output impedance <75Ω

INSERT RETURNS, EXTERNAL AND FOH TALKBACK INPUTS (Electronically Balanced)

sensitivity +4dBu
maximum i/p level +26dBu
input impedance >10KΩ balanced
TALKBACK MICROPHONE INPUT (Electronically Balanced)
- sensitivity: -20dBu to -50dBu
- maximum i/p level: 0dBu
- input impedance: 2kΩ

PHONES OUTPUT (Unbalanced)
- nominal level: +4dBu
- maximum output level:
  - +20dBu into 600Ω
  - 0dBu into 8Ω
- output impedance: 50Ω

Rear Connectors

**External Inputs, External Talkback In, Talkback Mic In**
(3-pin female XLR)
- Pin 1: Ground
- Pin 2: Signal Hot
- Pin 3: Signal Cold

**Insert Returns** (1/4” 3-pole Jack)
- Tip: Signal Hot
- Ring: Signal Cold
- Sleeve: Ground

**Insert Sends** (1/4” 3-pole Jack)
- Tip: Signal Hot
- Ring: Signal Cold
- Sleeve: Ground

**PFL, AFL Left and Right Outputs** (3 pin male XLR)
- Pin 1: Ground
- Pin 2: Signal
- Pin 3: Ground Sense

**Oscillator, Mix, Wedge and Talkback Outputs**
(3-pin male XLR)
- Pin 1: Ground
- Pin 2: Signal Hot
- Pin 3: Signal Cold

**Phones Output** (1/4” 3-pole Jack)
- Tip: Left Signal
- Ring: Right Signal
- Sleeve: Ground

(Note: the headphones socket is duplicated under the front armrest.)
Rear Connector Panels

(Note: Group Output Connectors have been removed from the diagram for clarity).

Power Supply Connector Panel
**SPECIFICATION NOTES AND CONDITIONS**

A The Console has a nominal output level of +4dBu: all input sensitivities are relative to this, i.e., with line input gain set to '0', an input of 0dBu will give an output of +4dBu at any group or mix output, and a sensitivity of +4dBu gives unity gain from input to output.

B Noise measurements are taken with 22Hz-22kHz bandwidth, rms-reading response.

C Distortion measurements are made with an input of +20dBu (line inputs at unity gain) giving an output of +20dBu. The analyser reads THD+N with an average response over a 10Hz-30kHz bandwidth.

D Frequency response and EQ measurements are made with an input of 0dBu to line inputs at unity gain: outputs are quoted relative to 0dBu.

E Crosstalk and rejection measurements are made with an input level of +20dBu (line inputs at unity gain) giving an output of +20dBu on the active signal path. The ratio quoted is relative to +20dBu output.

F Gain tolerance is +/- 1.5dB or 10% of the indicated value, whichever is the greater.

G Group Noise: noise measured at the group output with faders at unity, and channel send pots down.

H Mix Noise: noise measured at the stereo mix output with faders at unity, and channel sends off.
Performance Specifications

Measured on a 40 channel console.

**Frequency response**

Line input to any output: 20Hz - 20kHz, ±0/-0.5dB

**Crosstalk (measured at 1kHz)**

- Channel CUT isolation: >100dB
- Channel Fader isolation: >75dB
- Channel Send Pot isolation: >90dB
- Channel Send ON isolation: >100dB
- Group Fader isolation: >100dB
- Group CUT isolation: >110dB
- Group to Group crosstalk: <90dB
- Group to Mix crosstalk: <100dB
- Mix to group crosstalk: <90dB

**CMRR**

Mic Input: >80dB

**Noise (22Hz-22kHz bw, unweighted rms)**

- XLR input at maximum sensitivity: <-127.5dBu (200ohm source)
- Group Output noise: <-85dBu (Group faders at unity, channel sends down)
- Mix output noise: <-85dBu (Mix faders at unity, channel sends off)

**Distortion (THD + Noise, measured at 20dBu, 30kHz bw)**

- Line In to Group or Mix out: <0.005% @ 1kHz
  - <0.025 @ 10kHz
Dimensions

SM16 Outline Dimensions

All dimensions are in millimetres

Dimensions - end view

Length:
- 48 channel: 2142.3
- 40 channel: 1859.1
- 32 channel: 1575.9

48 Channel Console

32 Channel Console

40 Channel Console
1 **Soundcraft** means Soundcraft Electronics 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 available 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.
## Glossary

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Auxiliary Send</strong></td>
<td>an output from the console comprising a mix of signals from channels and groups derived independently of the main stereo group mixes. Typically the feeds to the mix are implemented on rotary level controls.</td>
</tr>
<tr>
<td><strong>Balance</strong></td>
<td>the relative levels of the left and right channels of a stereo signal.</td>
</tr>
<tr>
<td><strong>Clipping</strong></td>
<td>the onset of severe distortion in the signal path, usually caused by the peak signal voltage being limited by the circuit’s power supply voltage.</td>
</tr>
<tr>
<td><strong>CR (Control Room) Monitors</strong></td>
<td>loudspeakers used by the operator (engineer) in the control room to listen to the mix.</td>
</tr>
<tr>
<td><strong>dB (decibel)</strong></td>
<td>a ratio of two voltages or signal levels, expressed by the equation $\text{dB}=20\log_{10}(V1/V2)$. Adding the suffix ‘u’ denotes the ratio is relative to 0.775V RMS.</td>
</tr>
<tr>
<td><strong>DI (Direct Injection)</strong></td>
<td>the practice of connecting an electronic musical instrument directly to the input of the mixing console, rather than to an amplifier and loudspeaker which is covered by a microphone feeding the console.</td>
</tr>
<tr>
<td><strong>Equaliser</strong></td>
<td>a device that allows the boosting or cutting of selected bands of frequencies in the signal path.</td>
</tr>
<tr>
<td><strong>Foldback</strong></td>
<td>a feed sent back to the artistes via loudspeakers or headphones to enable them to monitor the sounds they are producing.</td>
</tr>
<tr>
<td><strong>Frequency Response</strong></td>
<td>the variation in gain of a device with frequency.</td>
</tr>
<tr>
<td><strong>(sub) Group</strong></td>
<td>an output into which a group of signals can be mixed.</td>
</tr>
<tr>
<td><strong>Headroom</strong></td>
<td>the available signal range above the nominal level before clipping occurs.</td>
</tr>
<tr>
<td><strong>Highpass Filter</strong></td>
<td>a filter that rejects low frequencies.</td>
</tr>
<tr>
<td><strong>Line Level Signals</strong></td>
<td>at a nominal level of -10dBV to +6dBu, coming from a low impedance source.</td>
</tr>
<tr>
<td><strong>Noise Gate</strong></td>
<td>an electronic switch which only passes signals exceeding a set threshold level.</td>
</tr>
<tr>
<td><strong>Pan (pot)</strong></td>
<td>abbreviation of ‘panorama’: controls levels sent to left and right outputs.</td>
</tr>
<tr>
<td><strong>Patchbay</strong></td>
<td>a connection panel providing access to most input/output signals on the console, allowing the operator to redirect or rearrange internal and external connections using flexible patch cords.</td>
</tr>
<tr>
<td><strong>Peaking</strong></td>
<td>an equaliser response curve affecting only a band of frequencies i.e. based on a bandpass response.</td>
</tr>
<tr>
<td><strong>PFL (Pre-fade Listen)</strong></td>
<td>a function that allows the operator to monitor the pre-fade signal in a channel independently of the main mix.</td>
</tr>
<tr>
<td><strong>Rolloff</strong></td>
<td>a fall in gain at the extremes of the frequency response.</td>
</tr>
<tr>
<td><strong>Shelving</strong></td>
<td>an equaliser response affecting all frequencies above or below the break frequency i.e. a highpass or lowpass derived response.</td>
</tr>
<tr>
<td><strong>Spill</strong></td>
<td>acoustic interference from other sources.</td>
</tr>
<tr>
<td><strong>Talkback</strong></td>
<td>the operator speaking to the artistes or to tape via the auxiliary or group outputs.</td>
</tr>
</tbody>
</table>