Super 9000

User Guide

Solid State Logic
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PLEASE READ ALL INSTRUCTIONS, PAY SPECIAL HEED TO SAFETY WARNINGS.

E&OE

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Initial Release

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Overview

Introduction

Super 9000 is an all-in-one channel strip that combines the very best of SuperAnalogue™ technology to deliver the modern SSL sound. First introduced in the legendary SL 9000 J and perfected in Duality, the Super 9000 Channel Strip offers the ultra-low distortion, exceptional punch and breathtaking clarity of SSL SuperAnalogue™ studio consoles in a single rack unit. The 9000-Series made rock and pop mixes sound bigger than ever, whilst also enhancing hip-hop and R&B with deep, extended low-end and shimmering highs. Renowned for making music sound larger than life with unmatched dynamics and depth, the 9000-Series became the industry standard of its era – setting a milestone in analogue design and paving the way for the development of the Duality and Oracle consoles. Now, Super 9000 brings that same professional polish - once exclusive to the colossal 9K consoles - straight into your studio.

Prestigious facilities, including Abbey Road and Metropolis Studios (London), Real World Studios (Bath), Record Plant (LA), and Avatar/Power Station (NY), quickly made the 9000-Series their standard. Top engineers such as Manny Marroquin (Alicia Keys, Rihanna), Michael Brauer (Coldplay, John Mayer), Kevin Shirley (Iron Maiden, Led Zeppelin), and Tony Maserati (Jay-Z, Beyoncé) used SuperAnalogue™ sound to craft genre-defining hits.

SuperAnalogue™ Design

SuperAnalogue™ technology creates a signal path so transparent and wide bandwidth that nothing is lost, putting the engineer right there in the room with the artist. Key design elements include:

- Super-wide audio bandwidth
- Ruler flat frequency response
- Ultra-low transient inter-modulation distortion
- No electrolytic capacitors in the audio path
- Exceptionally low noise and harmonic distortion
- Extremely low phase shift across the audible spectrum

The result is unmatched punch, definition and a larger-than-life sound stage. These are the qualities that define the "modern SSL sound" and the reason why SuperAnalogue™ consoles remain the professionals' choice for music production.

Safety Notices

Please read the safety notice information included on the Safety Sheet inside the box before using Super 9000. This information is also available in Appendices section of this User Guide.

Features

- Dual Mic Preamp – Choose between SuperAnalogue™ (9000) & VHD™ (Duality)
- 2 Impedance options for the Mic Pre – 1.3 kΩ and 11 kΩ
- +48V, Polarity invert, Pad and Line Input
- Input Flip - allows the LINE input connection to feed the Mic Pre
- Quintessential 9000/Duality Dynamics section
  - ➤ High-Performance THAT 2181A VCA compressor section
    - ◊ Peak/Hard Knee or Soft Knee modes
    - ◊ FAST attack on/off
- Classic Gate/Expander section
  - ➤ Fast attack on/off
  - ➤ Hold control
- 4-band SSL EQ
  - ➤ Switchable between G-Series 'Pink Knob' 292 and E-Series 'Black Knob' 242 circuits
    - ◊ LMF ÷3 and HMF x3 buttons in 292 mode
    - ◊ LF and HF Bell/Shelf switching in 242 mode
  - ➤ Fully parametric mid-bands
- High and Low-Pass Filters
  - ➤ 18 dB per octave HPF & 12 dB per octave LPF
- Balanced Insert point for connecting external devices into the signal path
- Extensive 'to side-chain' functionality
  - ➤ Filters to Dynamics side-chain
  - ➤ EQ to Dynamics side-chain
- Flexible process-order routing
  - ➤ Filters to input, Dynamics post-EQ, Insert to output
- Line Output Trim
- Switchable input/output metering
- External side-chain (key) input
- Dynamics side-chain link – allows 2 x Super 9000s compressors to work as a stereo pair

Installation

Unpacking

The unit has been carefully packed and inside the box you will find the following items.

- ➤ Super 9000
- ➤ IEC power cord for your country
- ➤ Safety Sheet

It is always a good idea to save the original box and packaging, just in case you ever need to send the unit in for service.

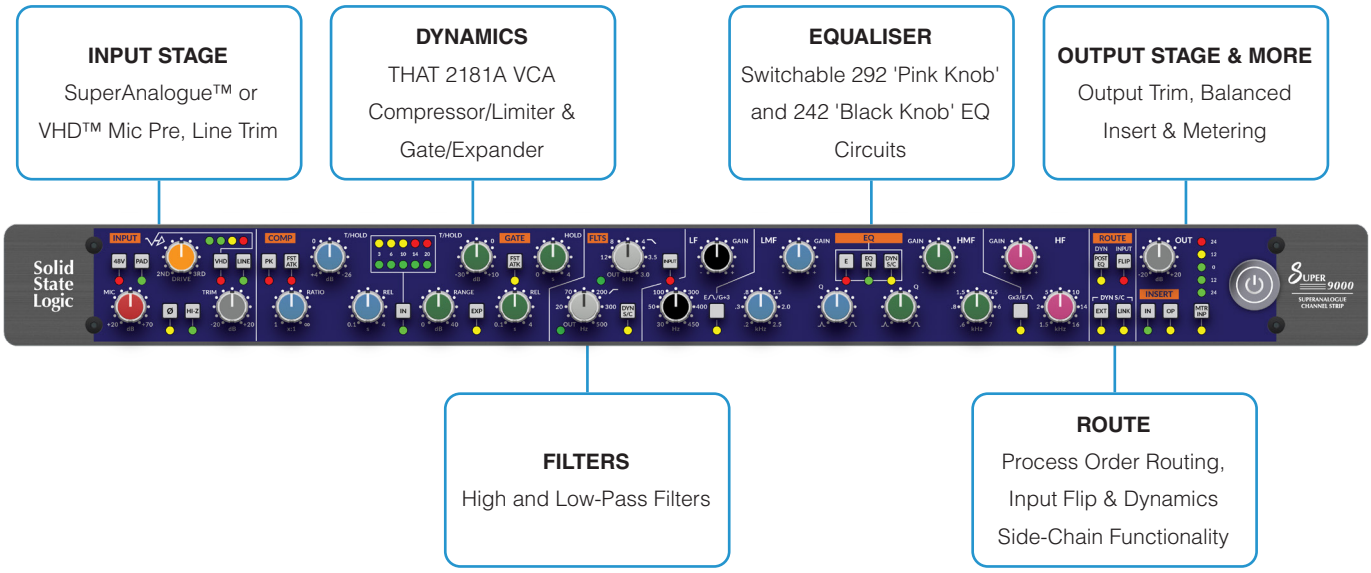
Rack Mounting, Heat and Ventilation

Super 9000 is a 1U, 19" rackmount piece of equipment designed to sit in the racking of a producer's desk or similar. It is recommended that ventilation space is left above and below the unit so any heat generated by Super 9000 can naturally disperse. The sides of the unit's chassis have cut-outs that should under no circumstances be blocked or covered. Always allow the unit to cool down before handling.

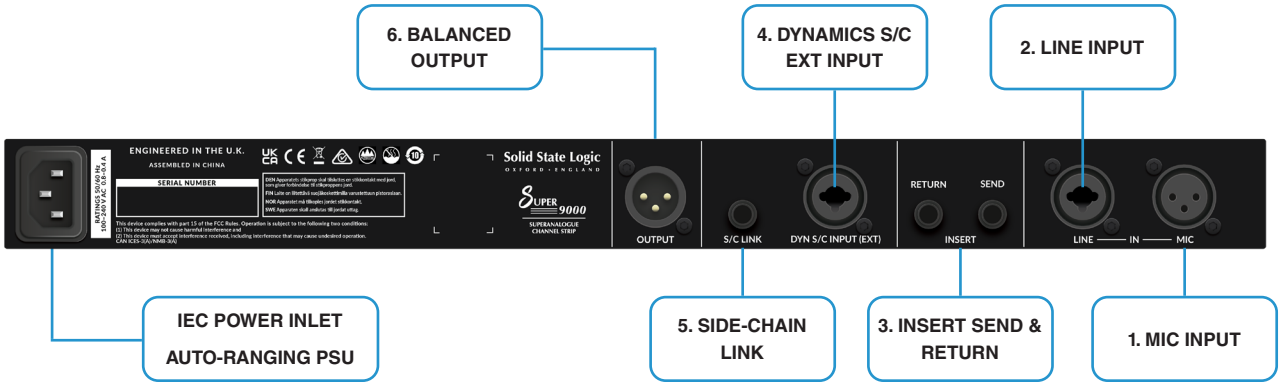
Hardware Overview

This page provides an overview of the Super 9000 hardware. The tutorial section covers each control in more detail.

Front Panel



Rear Panel



Connections Overview

1 - MICROPHONE INPUT

Female XLR

The XLR labelled **MIC IN** is for microphone signals.

2 - LINE-LEVEL INPUT

Combo XLR/TRS Jack

The Combo XLR/TRS jack labelled **LINE IN** is for line level signals such as a synthesiser or a DAW output.

3 - INSERT SEND & RETURN

TRS Jacks

The TRS jacks labelled **INSERT SEND** and **INSERT RETURN** are for incorporating line-level outboard analogue processing equipment into Super 9000's signal path. The inserts are fully-balanced.

4 - DYNAMICS SIDE-CHAIN EXTERNAL INPUT

Combo XLR/TRS Jack

The Combo XLR/TRS labelled **DYN S/C INPUT (EXT)** is for external line-level signals that can be used to drive the dynamics side-chain (key input).

5 - SIDE-CHAIN LINK

TRS/TS Jack

The TRS/TS jack labelled **S/C LINK** can be used to link the compressor side-chain control voltages of 2 x Super 9000 units for stereo pair use.

6 - BALANCED OUTPUT

Male XLR

The XLR labelled **OUTPUT** is a line-level output. Connect this to the line-level input of your DAW recording system (audio interface/converter) or mixing desk etc.

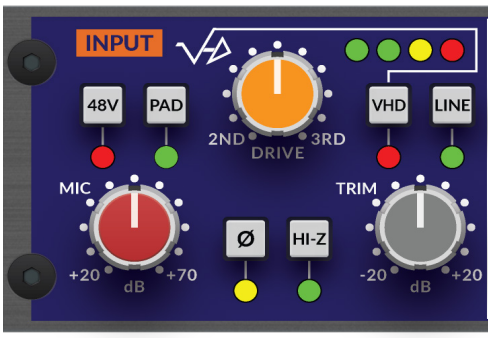
Tutorial

Power

Power on the unit by pressing the silver power button on the right-hand side.

Input Stage

Microphone Preamp & Line Trim



Super 9000 allows you to choose between two completely independent mic preamp stages. Both have electronically balanced inputs with very different but complementary sonic qualities. The default preamp uses the acclaimed SuperAnalogue™ circuitry to provide an extremely low noise, extended bandwidth front end with the minimum of signal colouration. Alternatively, the VHD™ (Variable Harmonic Drive) preamp emulates the overload characteristics of a traditional valve/tube designs but with the ability to tailor the warmth or musicality.

MIC

The microphone preamp control provides +20 to +70 dB of gain. This control does not affect the line-level input path.

48V

Provides +48V phantom power, required for certain condenser and active ribbon microphones.

PAD

Introduces a 20 dB pad ahead of the microphone preamp gain control. Useful for microphones that have higher sensitivity/a high output level and therefore require less gain. Also useful in conjunction with **INPUT FLIP** for processing line-level DAW returns.

Ø

The **Ø** (polarity) button inverts the polarity, useful for multi-miked sources that may be suffering from phase cancellation. It affects whichever input path is selected (Mic or Line).

HI-Z

Changes the Mic Preamp impedance to 11 kΩ, instead of the nominal 1.3 kΩ. Impedance selection may affect the sonic signature of some ribbon and dynamic microphones.

VHD

Switches to the VHD™ mic preamp circuit. Four LEDs above the **VHD** button indicate how hard the VHD circuit is being driven.

DRIVE

Shapes the overload characteristic to provide a controlled blend of 2nd (valve-esque) and 3rd harmonic distortion (transistor-esque).

The best way to drive the VHD™ preamp is to increase the input gain (MIC control), while turning the TRIM control down to reduce the overall level and not clip the channel output. Remember, it's the input to the preamp that likes being driven. From this point, adjust the harmonics using the DRIVE control, to fine-tune the desired sound.

LINE

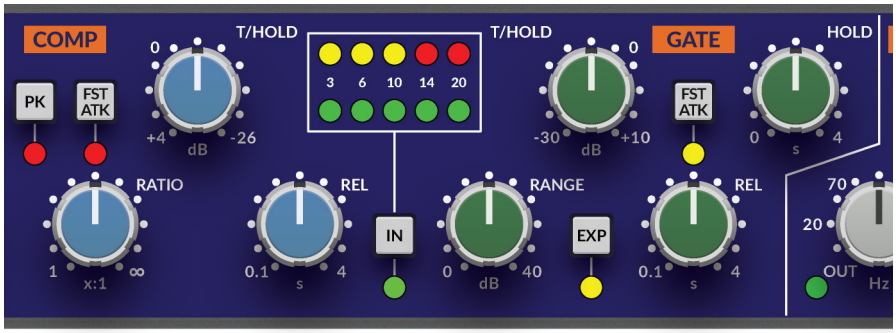
Switches the input to the line-level input on the rear panel (**LINE IN**), instead of the microphone input. The line-level input is sourced post the microphone preamp and therefore the **MIC** control does not function when **LINE** is selected. However, if you want to run the signal you have connected to the **LINE IN** through the microphone preamp, engage the **INPUT FLIP** button in the **ROUTE** section *and also* disengage the **LINE** button. This feature internally swaps the rear panel **MIC** and **LINE** connections, so there is no need to re-patch any cables manually!

TRIM

The line trim provides an additional ± 20 dB of clean gain post the microphone preamp gain. This control also affects the line-level input path if **LINE** is selected.

Dynamics

The Dynamics section contains a Compressor/Limiter section identical to that of the 9000-Series and Duality consoles. It deploys a high-performance THAT 2181A VCA as the gain reduction element. In normal use, the compressor's true RMS side-chain and soft-knee provide a very transparent compression, even with large amounts of gain reduction. The fast attack (**FST ATK**) option offers a quicker attack time, useful for clamping down on particularly 'spiky' percussive sources. Selecting Peak (**PK**) mode defeats the soft-knee and changes the circuit to peak sensing, resulting in a hard-knee characteristic. The Gate/Expander section is identical to that of the 9000-Series consoles, featuring the choice of a steep gate or gentle 2:1 downwards expander slope, with optional fast attack, as well as both **RELEASE** and **HOLD** controls.



In true SSL channel strip tradition, the Filters and/or the Equaliser section can be assigned to the dynamics side-chain allowing further technical or creative manipulation of the signal the compressor reacts to. e.g. Filtering out some low-end in the compressor side-chain may be especially important for bass-heavy music. This is achieved by engaging the **DYN S/C** button(s) in the Filters and EQ sections. The Dynamics side-chain can also source from an external input - see the Routing section for more details.

By default, the Dynamics section is ahead of the Equaliser in processing order but this can be reversed by engaging the **DYN POST EQ** button in the **ROUTE** section (9000-Series console owners may be more au fait with this button being labelled as 'CH OUT' ;)) Processing order and side-chain options are covered in more detail in the Signal Flow Options and To Side-Chain Processing sections of the user guide.

If you have two Super 9000 units in use across a stereo source, the **S/C LINK** allows the side-chain control signals of multiple units to be linked. For more detail, refer to the Routing section of the user guide.

DYN IN

Toggles the Dynamics section (Compressor/Limiter & Gate circuits) in/out.

Compressor/Limiter

RATIO

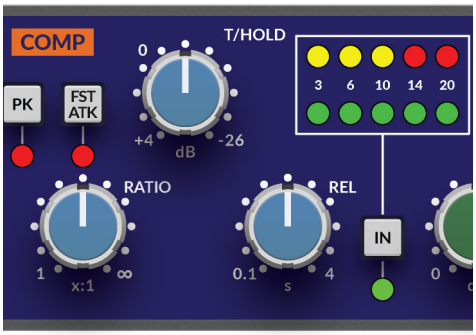
When turned to 1:1, the Compressor/Limiter section is inactive. Turning the control clockwise increases the compression ratio to give a true limiter at the fully clockwise position.

PK

The compressor ordinarily has a soft-knee. Engaging the **PK** button changes the circuit to peak sensing, and replaces the soft-knee characteristic with a hard knee, providing an alternative for some instruments.

THRESHOLD

Whenever a signal exceeds the level set by this control, the compressor will start to act at the ratio set by the **RATIO** control. This control also provides automatic make-up gain, so as you lower the threshold and introduce more compression, the output level is increased, maintaining a steady output level regardless of the amount of compression.



RELEASE

Sets the time constant (speed) with which the compressor returns to normal gain settings once the signal has passed its maximum.

FAST ATT

Provides a faster attack time (3 ms for 20 dB gain reduction).
When out, the attack time is program dependent (3 ms - 30 ms).

Attack Time when FAST ATT is switched out

When **FST ATT** is switched out, the attack time is, generally speaking, still quicker than the early 4000 E compressor design (with its Fast Attack also switched out), due to a combination of incremental circuit revisions and VCA component changes. The 9000-Series Dynamics inherited many of the dynamics circuit tweaks from the 4000 G but also added the peak sensing mode. In general, the 9000 dynamics has a refined 'tightness' and a little more 'control' to it, when compared to the all-discrete Class A VCA design found in Revival 4000.

GAIN REDUCTION LEDS

The yellow and red LEDs, on the top row of the LED display area, indicate the amount of gain reduction (compression).

Gate/Expander

The Expander/Gate section can act either as a ∞:1 Gate or, when the **EXP** switch is pressed, a 2:1 Downwards Expander.

RANGE

Determines the depth of gating or expansion. When turned fully anti-clockwise, the Expander/Gate section will be inactive. When turned fully clockwise, a range of 40 dB can be obtained.

THRESHOLD

Variable hysteresis is incorporated in the threshold circuitry. For any given 'open' setting, the Expander/Gate will have a lower 'close' threshold. The hysteresis value is increased as the threshold is lowered. This is very useful in music recording as it allows instruments to decay below the open threshold before gating or expansion takes place.

RELEASE

This determines the time constant (speed), variable from 0.1 – 4 seconds, at which the Gate/Expander reduces the signal level once it has passed below the threshold. Note that this control interacts with the **RANGE** control.

FAST ATT

Provides a fast attack time (100 µs per 40 dB). When off, a controlled linear attack time of 1.5ms per 40 dB is selected. The attack time is the time taken for the Expander/Gate to 'recover' once the signal level is above the threshold. When gating signals with a steep rising edge, such as drums, a slow attack may effectively mask the initial 'THWACK', so you should be aware of this when selecting the appropriate attack mode.

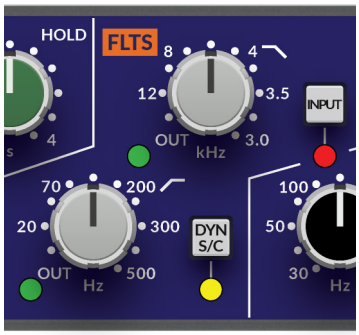
HOLD

Determines the time after the signal has decayed below the threshold before the gate closes. Variable from 0 to 4 seconds.

GAIN REDUCTION LEDS

The green LEDs in the display section indicate Expander/Gate activity (the amount of gain reduction).

Filters



In common with both 4000 and 9000-Series SSL consoles, a pair of High and Low-Pass Filters are provided. Both Filter controls incorporate bypass switching, which is activated when turned fully anti-clockwise; turning either control up will put that band in circuit, illuminating the LED adjacent to the control to indicate this state. The Filters are normally placed post-EQ but can be repositioned to be just after the input stage (post-Insert), or, into the dynamics side-chain. The Low-Pass Filter exhibits a 12 dB/octave slope whilst the High-Pass Filter delivers a 18 dB/octave slope.

DYN S/C

Switches the Filters into the side-chain of the Dynamics section. The Equaliser can also be switched into the side-chain independently. Note that **DYN S/C** overrides the **INPUT** function (see below).

INPUT

Moves the Filters to put them in circuit near the front-end of the channel strip - post Input Stage and Insert Point, pre-Dynamics and EQ. This allows the Filters to be used to clean up signals before compressing or equalising them.

This space is intentionally almost blank... it's an SSL tradition.

Equaliser

The Super 9000 Equaliser section defaults to the 'Pink Knob' 292 circuit, developed originally for the 4000 G-series consoles. The 292 employs a variable-Q design for the parametric mid-bands, meaning that smaller boosts/cuts naturally result in wider bell curves, whilst larger boosts/cuts result in narrower bell curves. The high frequency and low frequency shelves of the 292 offer a steeper response to that of the 242, along with the distinctive 'undershoot/overshoot' behaviour at the corner frequency which many engineers describe as extremely musical.

Super 9000 EQ section also features two buttons labelled **E Bell/G÷3** and **Gx3/E Bell**. When in 292 mode, these buttons allow the Low-Mid Frequency to be divided by 3 and the High-Mid Frequency to be multiplied by 3, so that the mid-bands can be used to target frequencies far outside of their standard range. This flexibility lets you sculpt bell curves with either wide or narrow Q settings in the low and high frequency regions, in addition to deploying the low and high frequency shelf controls.

Alternatively, you can switch to the E-Series 'Black Knob' 242 EQ circuit, by engaging the **E** button. This circuit was developed in conjunction with the legendary George Martin for the first SSL 4000 E console to be installed in AIR studios. It deploys a constant-Q design for the LMF and HMF frequency bands, meaning that the Q does not narrow or widen depending on the gain setting. The E-Series EQ is often described as being more 'surgical', which is particularly useful for drums, since a relatively high Q is available at low gain settings. However, it may not be so suitable for overall EQ or subtle corrections, as you need to adjust the Q to maintain the same effect when the gain is changed - for those tasks, the 292 may be more effective.

When in 242 mode, the two buttons labelled **E Bell/G÷3** and **Gx3/E Bell** allow the Low Frequency and High-Frequency bands to be switched between Bell or Shelving Filters.

As mentioned above, the EQ section has some function buttons associated with it:

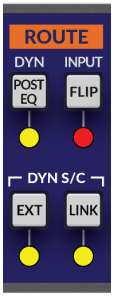
EQ IN
Switches the EQ section into circuit.

E
Switches the EQ from 292 'Pink Knob' operation to 242 'Black Knob' operation.

DYN S/C
Switches the EQ into the side-chain of the Dynamics section. The Filters section can be switched into the Dynamics side-chain independently of the EQ.

If both Filters and EQ sections are assigned to the Dynamics side-chain, the Filters section precedes the EQ.

Routing



The **ROUTE** section provides a number of processing order and side-chain routing possibilities.

DYN (POST EQ)
Moves the Dynamics section to be post the EQ.

INPUT (FLIP)
Swaps the routing of the rear panel connections, so that the **LINE** input feeds the Mic Pre and the **MIC** input is routed to the line-input path. This provides an easy way to process line-level DAW returns (likely patched into the **LINE** input) with saturation/distortion processing at the mix stage, without having to manually re-patch cables.

EXT (DYN S/C)
Enables the Dynamics side-chain to be sourced from an external (key) input, connected to the rear panel **DYN S/C INPUT EXT** Combo XLR/TRS Jack input. For full flexibility, **FILTERS TO DYN S/C** and **EQ TO DYN S/C** will still affect the external side-chain source if engaged.

LINK
If you have 2 x Super 9000 units connected together using the **S/C LINK** TRS/TS jack connections on the rear of the unit, the side chain control signals will be linked by pressing the **LINK** buttons on the front panel of *both* units. When two Dynamics sections are linked, the control voltages of each section sum together, so that whichever section has the most gain reduction will control the other one (loudest signal wins).

This is particularly useful and important when using 2 x Super 9000s as a stereo pair, as it ensures that both channels react uniformly to the loudest signal present in either the left or right side of the mix. This prevents the stereo image from shifting or “wobbling” due to one side being compressed more heavily than the other. By letting the loudest signal trigger equal gain reduction across both compressors, the stereo balance remains stable and musical, which is critical for preserving a solid, punchy stereo image on busses like drums, guitars, or the mix bus.

There are some important things to be aware of when linking in this way:

- You can use either a TRS or TS jack for linking two units - it does not matter which type is used.
- Ensure *both* units have their **LINK** buttons engaged.
- Both sets of front panel Compressor control positions, button states and gain staging into the compressor must be manually matched across both units.
- The front panel Dynamics compression LEDs continue to monitor the individual internal side-chains, *not* the combined control voltage that is actually driving the VCA for compression. Therefore, the front panel compressor gain reduction LEDs may make it *seem* like one unit is compressing more than the other. However, providing all steps above have been followed, the reality is the compressor will be maintaining a rock solid stereo image. The LEDs continuing to monitor their individual side-chains is useful as it gives you an indication of which side-chain signal is 'winning' at any particular moment and therefore driving the compression activity.

Balanced Insert

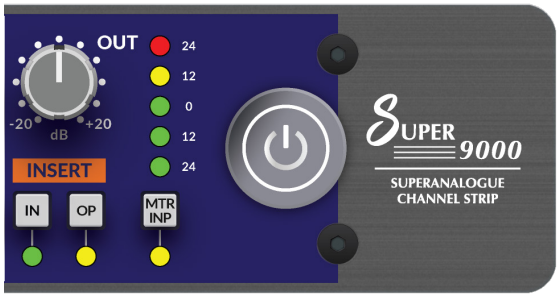
Super 9000 has a balanced insert point for incorporating additional outboard processing equipment into the signal chain. The **SEND** and **RETURN** TRS Jacks are located on the rear of the unit.

IN

In true SSL fashion, the Insert Send is always active and engaging the **IN** button activates the Return path to introduce the processed audio into Super 9000's signal path.

OP

By default, the Insert point is located immediately after the input stage, ahead of the Dynamics, EQ and Filters. Pressing the **OP** button relocates the insert point to be at the end of the processing chain (post all of the sections mentioned above) but pre the Output Trim control.



Output Stage and Metering

OUT

A dedicated Output Trim provides an additional ± 20 dB of clean gain at the end of the signal chain for full control of the signal level exiting via the Balanced Output.

METER

5 LEDs provide signal level metering at the following points:

- +24 dBu
- 12 dBu
- 0 dBu
- -12 dBu
- -24 dBu

MTR INP

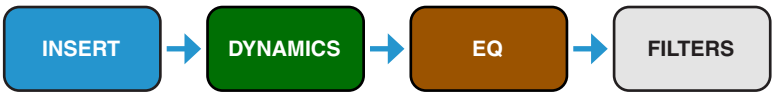
Normally, the meter reads the output of the channel but selecting **MTR INP** will meter the signal immediately after the input section.

Signal Flow Options

There are three switches that control the order of the signal processing elements in the main signal path. These are **FILTERS TO INPUT**, **DYN(AMICS) POST EQ** and **INSERT OP** (To Output). Many processing orders are possible.

Default

No buttons pressed

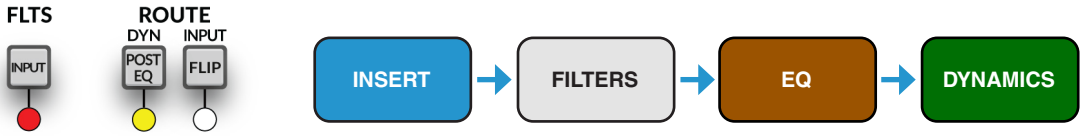


Insert To Output

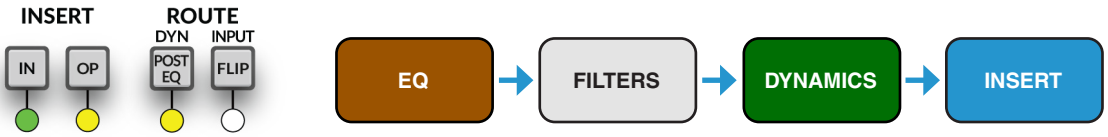
Dynamics Post EQ

Filters To Input

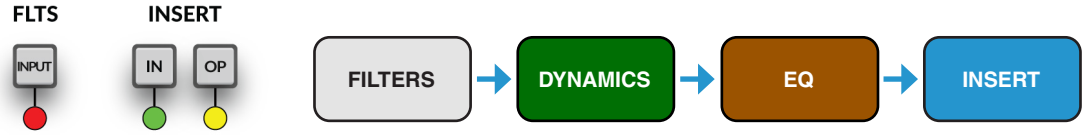
Filters To Input, Dynamics Post EQ



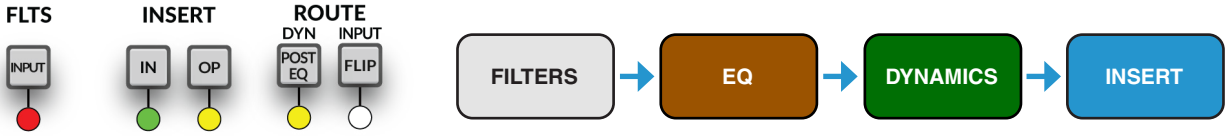
Insert To Output, Dynamics Post EQ



Filters To Input, Insert To Output



Filters To Input, Insert To Output, Dynamics Post EQ

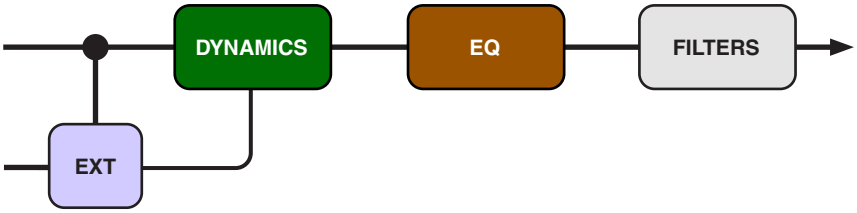


To Side-chain Processing

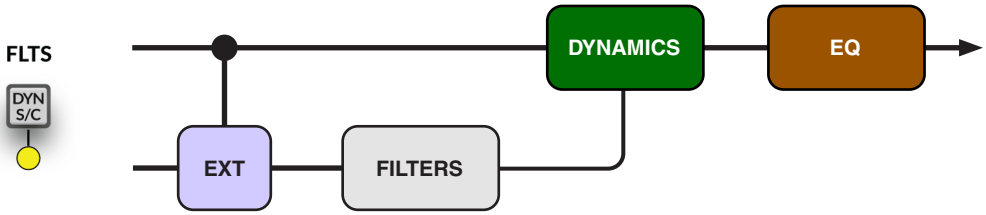
The EQ and Filters can be assigned to the dynamics side chain using the **DYN S/C** switches in their respective sections. The table below shows the side-chain source and processing order for the various combinations:

Default

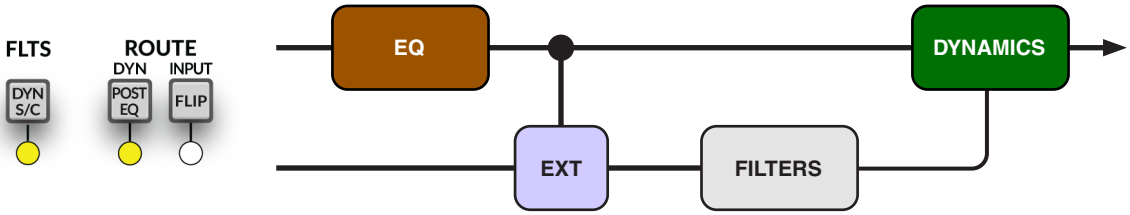
No S/C buttons pressed



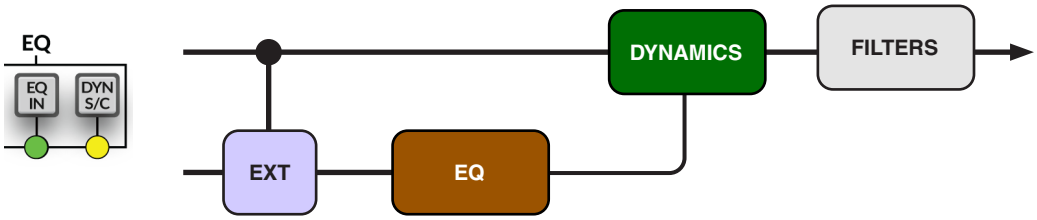
Filters to Dynamics Side-chain



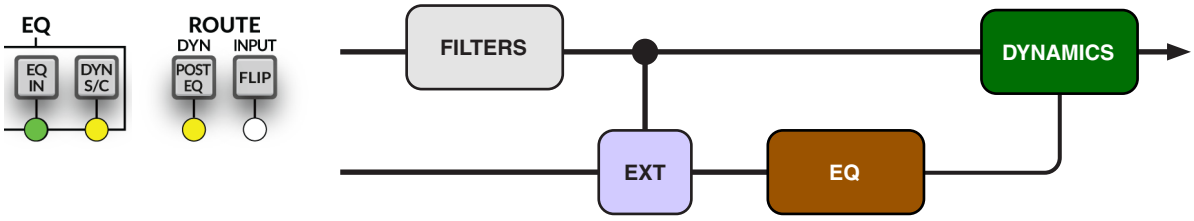
Filters to Dynamics Side-chain & Dynamics Post EQ



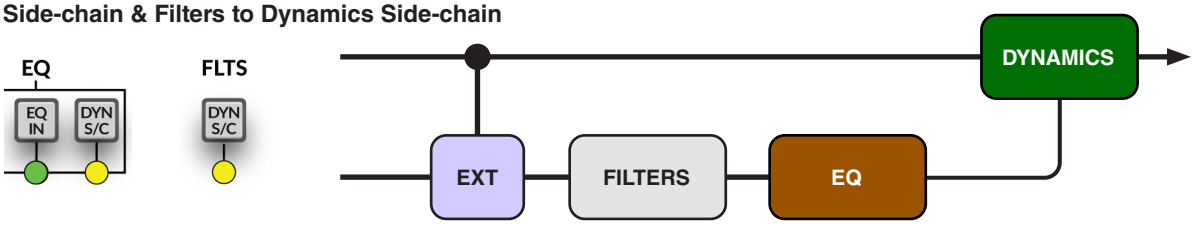
EQ to Dynamics Side-chain



EQ to Dynamics Side-chain & Dynamics Post EQ



EQ to Dynamics Side-chain & Filters to Dynamics Side-chain



Specifications

Connector Details

Mic Input

Location: Rear Panel	
Connector Type: XLR Female	
Pin	**Description**
1	Chassis
2	Audio +ve
3	Audio -ve

Output

Location: Rear Panel	
Connector Type: XLR Male	
Pin	**Description**
1	Chassis
2	Audio +ve
3	Audio -ve

Line Input

Location: Rear Panel		
Connector Type: Combo XLR Jack		
Pin		**Description**
1	Sleeve	Chassis
2	Tip	Audio +ve
3	Ring	Audio -ve

Dynamics Side-chain Input (External)

Location: Rear Panel		
Connector Type: Combo XLR Jack		
Pin		**Description**
1	Sleeve	Chassis
2	Tip	Audio +ve
3	Ring	Audio -ve

Insert Send

Location: Rear Panel	
Connector Type: TRS Jack	
Pin	**Description**
Tip	Audio +ve
Ring	Audio -ve
Sleeve	Chassis

Insert Return

Location: Rear Panel	
Connector Type: TRS Jack	
Pin	**Description**
Tip	Audio +ve
Ring	Audio -ve
Sleeve	Chassis

Side-chain Link

Location: Rear Panel	
Connector Type: TRS Jack	
Pin	**Description**
Tip	Link Bus
Ring	Disconnected
Sleeve	Ground

TRS or TS jacks can be used

Physical

Width	482.6 mm / 19 inches
Height	43.18 mm / 1.7 inches (1 RU)
Depth	276.86 mm / 10.9 inches
Weight	3.7 kg / 8.15 lbs
Boxed Dimensions	609.6 mm x 83.82 mm x 335.28 mm (24" x 3.3" x 13.2")
Boxed Weight	4.84 kg / 10.66 lbs

Power

Power Supply	Auto-Ranging 100-240 VAC
Operating Power	< 20 Watts

Audio Performance

Default test conditions (unless otherwise stated):

Source impedance of test set: 50 Ω
Input impedance of test set: 100 kΩ
Reference frequency: 1 kHz
Reference level: 0 dBu
All unweighted measurements are specified as 20 Hz to 20 kHz bandwidth limited, expressed in dBu.
Onset of clipping (for headroom measurements) should be taken as 1% THD.
All levels are intended balanced, unless explicitly defined otherwise.
Line Input by default (unless otherwise stated)
TRIM set to center position (0 dB)
Gain set to minimum

All figures have a tolerance of ±0.5dB or 5%. If 'typical' is stated, then the tolerance may be greater than 5%.

Mic Input to Insert Send

Measurement	Value	Conditions
Gain	+20 dB to +70 dB typical Independently switchable 20 dB Pad available	
Input Impedance	1.3 kΩ or 11 kΩ	
Max Input Level	> 27.3 dBu (9K), > 26.5 dBu (VHD)	+20 dB (with Pad) / VHD @ 2nd Position
Noise Floor (Unweighted)	< 93.4 dBu (9K) < 87.5 dBu (VHD)	20 dB, unweighted, 20 Hz - 20kHz, 150R termination
EIN (A-weighted)	< -129.9 dBu (9K), < -130.6 dBu (VHD)	70dB, Aweighted, 20 Hz - 20kHz, 150R termination
Frequency Response	±0.12 dB (9K), ±0.1 dB (VHD)	20 Hz to 20 kHz, any gain
THD+N Ratio	< -93.9 dB / 0.0020% (9K) < -68.5 dB / 0.0376% (VHD)	-25 dBu applied, 45dB gain, 20 dBu out, 1 kHz
CMRR	> 59.6 dB > 71.3 dB	50 Hz 1 kHz

Line To Insert Send

Measurement	Value	Conditions
Gain	-20 dB to +20 dB typical, with centre indent at 0 dB	
Input Impedance	10 kΩ	
Max Input Level	> 27.6 dBu	Unity gain
Noise Floor (Unweighted)	< -98.1 dBu	0 dB, unweighted, 20 Hz - 20kHz, 150R termination
Frequency Response	±0.036 dB	20 to 20 kHz, any gain
THD+N Ratio	< -110 dB / 0.0003%	20 dBu applied, 0 dB gain, 20 dBu out, 1 kHz

Insert Return to Output

Measurement	Value	Conditions
Impedance	10 kΩ	
Max Input Level	> 27.4 dBu	0 dB
Noise Floor (Unweighted)	< 98.5 dBu	0 dB, unweighted, 20 Hz - 20kHz, 150R termination
Frequency Response	±0.039 dB	20 to 20 kHz, any gain
THD+N Ratio	< -100.4 dBu / 0.0010%	20 dBu applied, 0 dB gain, 20 dBu out, 1 kHz

Channel Output

Measurement	Value	Conditions
Gain	-20 dB to + 20 dB typical, with centre indent at 0 dB	
Output Impedance	70 Ω	
Output Headroom	> 27.4 dBu	0 dB

EQ Controls

This is a four band equaliser that can be switched between two different sets of curves; one based on SSL's 292 G-Series ('Pink Knob') EQ and the other based on the 242 E-Series ('Black Knob') EQ. High and Low-Pass Filters are also available.

The Low Frequency (LF) and High Frequency (HF) bands have variable turnover frequency. In 242 E-Series mode, the LF and HF bands are switchable between bell or shelving using the **E Bell**/G÷3 or the **E-Bell**/Gx3 buttons respectively . In 292 G-Series mode, LF and HF are fixed in shelving mode.

• HF and LF Shelves - Normal ('G-Series type') curves with the 'E' switch OUT, have a modified slope with a degree of overshoot/ undershoot for increased selectivity.

• 'E type' curves with the 'E' switch IN follow conventional cut or boost characteristics
The two parametric bands have selectable characteristics which affect the relationship between frequency bandwidth and gain.

• With the 'E' switch OUT, the frequency bandwidth reduces with increased gain, thereby increasing the selectivity of the EQ as the gain is increased.

• With the 'E' switch OUT, the Low-Mid Frequency and High-Mid Frequency control ranges can be divided by or multiplied by 3 using the E Bell/**G÷3** or the E-Bell/**Gx3** buttons respectively, so that the mid-bands can be used to target frequencies far outside of their standard range, providing incredible flexibility.

• With the 'E' switch IN, the frequency bandwidth is constant at all gains.

• At full boost or cut both are identical.

HF Band Controls	Parameter Ranges
Frequency	Variable from 1.5 kHz to 16 kHz
Gain	Variable between ±18.5 dB typical
Q (on 'BELL' setting)	2.5

HMF Band Controls	Parameter Ranges
Frequency	Variable from 600 Hz to 7 kHz (1.8 kHz to 21 kHz with **Gx3** engaged)
Gain	Variable between ±20 dB typical
Q	Variable from 0.5 to 2.5 (may also vary with gain)

LMF Band Controls	Parameter Ranges
Frequency	Variable from 200 Hz to 2.5 kHz (66 Hz to 833 Hz with **G÷3** engaged)
Gain	Variable between ±20 dB typical
Q	Variable from 0.5 to 2.5 (may also vary with gain)

LF Band Controls	Parameter Ranges
Frequency	Variable from 30 Hz to 450 Hz
Gain	Variable between ±19 dB typical
Q (on 'BELL' setting)	2.5

EQ Circuit In

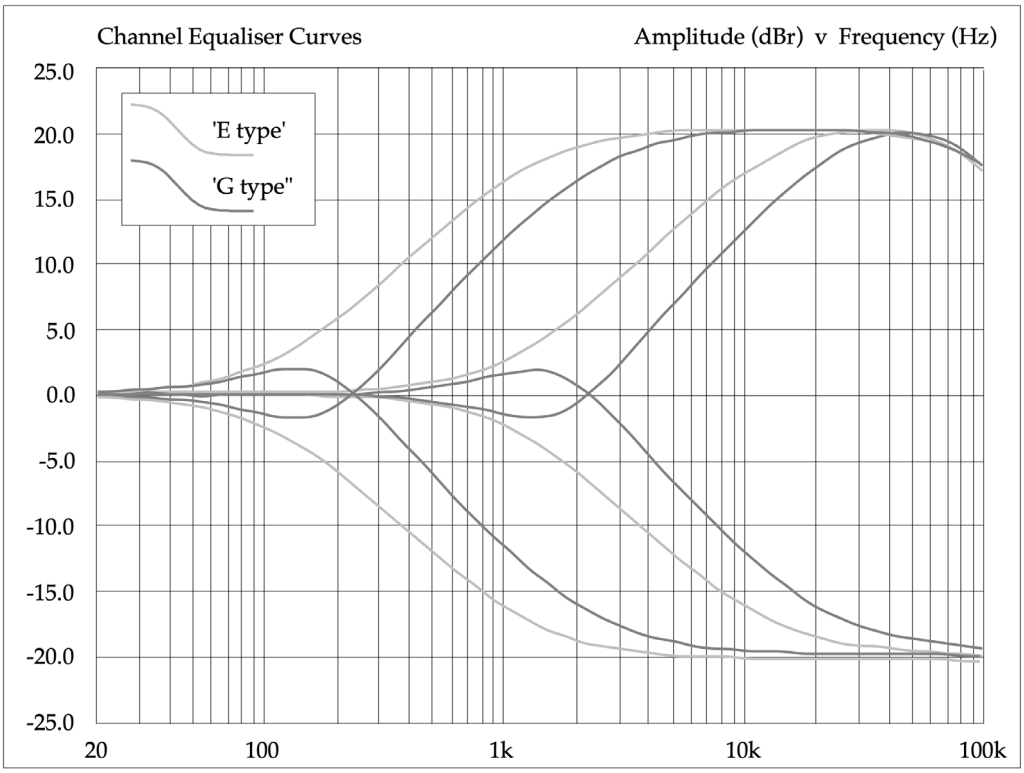
Measurement	Value	Conditions
Noise Unweighted	-89.0 dBu typical	0 dB, unweighted, 20 Hz - 20kHz, 150R termination
THD+N Ratio	-89.4 dBu typical	0 dB, 0 dBu out, 1 kHz

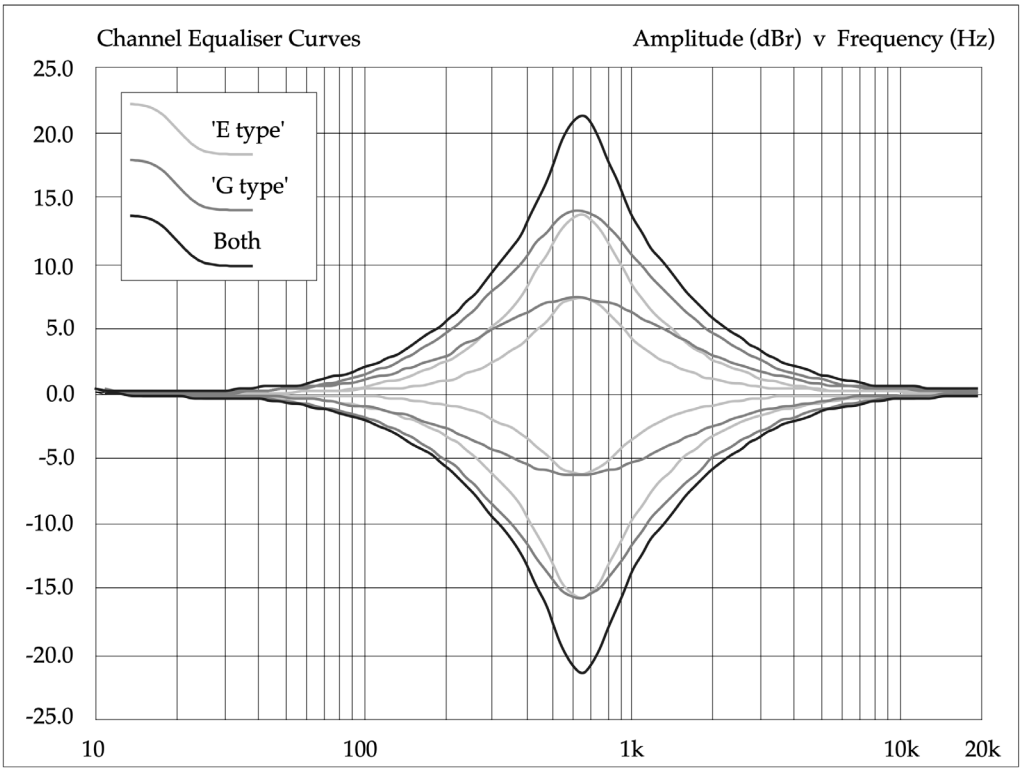
Filters Controls

Filters	Parameter Ranges
Low-Pass Frequency	3 kHz to 16 kHz (-3 dB Point)
Low-Pass Slope	12 dB / octave
High-Pass Frequency	20 Hz to 500 Hz (-3 dB Point)
High-Pass Slope	18 dB / octave

Filters Circuit In

Measurement	Value	Conditions
Noise Unweighted	-96.6 dBu typical	0 dB, unweighted, 20 Hz - 20kHz, 150R termination
THD+N Ratio	-96.2 dBu typical	0 dB, 0 dBu out, 1 kHz


Channel Equaliser Curves
Amplitude (dBr) v Frequency (Hz)
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
20
100
1k
10k
100k
'E type'
'G type"


Channel Equaliser Curves
Amplitude (dBr) v Frequency (Hz)
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
10
100
1k
10k
20k
'E type'
'G type'
Both

Dynamics Controls

The unit contains a complete dynamics section, the functions of which split into two areas; a Compressor/Limiter and an Expander/Gate.

Compressor/Limiter Controls	Parameter Ranges
Ratio	Variable from 1 to infinity (limit)
Threshold	Variable from +4 dB to -26 dB
Attack Slope	Normally 'Soft Knee', switchable to 'Hard Knee and Peak Sensing'
Attack Time	Normally Auto-sensing (3 ms to 30 ms), switchable to 3 ms ('Fast Att')
Release	Variable from 0.1 to 4 seconds

The Compressor/Limiter has two modes of signal detection, Peak and RMS. As their names suggest these modes of detection either act on peaks of the incoming signals or on their RMS levels. This gives two very different modes of compression and limiting with Peak Mode giving far more dramatic compression characteristics.

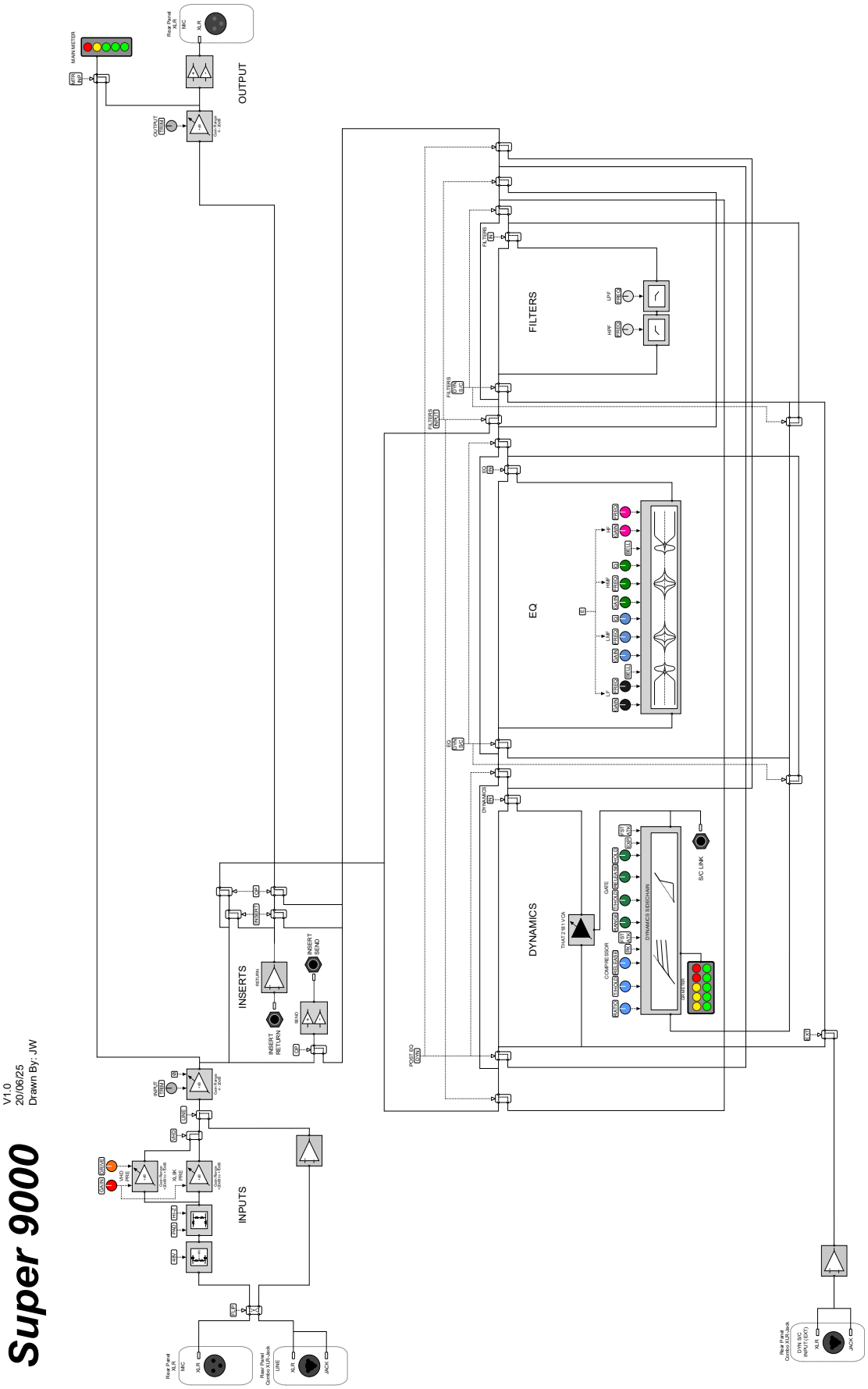
Expander/Gate Controls	Parameter Ranges
Range	Variable from 0 to 40 dB
Threshold	Variable from -30 dB to +10 dB
Attack Time	Normally 1.5 ms per 40 dB, switchable to 100 µs
Release Time	Variable from 0.1 to 4 seconds
Hold Time	Variable from 0 to 4 seconds

The side chain signal can be sourced either from the signal feeding the dynamics section or the external side-chain input. The Filters and/or the EQ can be inserted in the side-chain. LED meters independently indicate amount of compression and expansion.

Dynamics Circuit In

Measurement	Value	Conditions
Noise Unweighted	-89.4 dBu typical	0 dB, unweighted, 20 Hz - 20kHz, 150R termination
THD+N Ratio	-86.9 dBu typical	0 dB, 0 dBu out, 1 kHz

Block Diagram



Safety Notices

Important Safety Information

General Safety

Please read and keep this document and adhere to all warnings and instructions.
This electrical equipment should not be exposed to dust, water, or other liquids.
Clean only with dry cloth or products compatible with electrical devices and never when the unit is powered.
Do not operate near any heat sources, in direct sunlight or near naked flames.
Do not place heavy objects on the unit.
Only use attachments/accessories recommended by the manufacturer.
Unplug this apparatus during lightning storms or when unused for long periods of time.
Do NOT modify this unit, alterations may affect performance, safety and/or international compliance standards.
The unit can only be serviced by qualified personnel – seek immediate service if it has been exposed to water or if it ceases to operate normally.
SSL does not accept liability for damage caused by maintenance, repair or modification by unauthorised personnel.
When using this apparatus either fix it into a standard 19" rack or place it on a secure level surface.
If the unit is rack mounted, fit all rack screws. Rack shelves are recommended and ensure that loading of the rack does not create a hazard.
Always allow free flow of air around the unit for cooling. A 1U gap above and below the unit is recommended when rack mounted.
Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
Ensure that the maximum operating temperature is not exceeded when mounted in a rack.
Ensure that no strain is placed on any cables connected to this apparatus. Ensure that all such cables are not placed where they can be stepped on, pulled or tripped over.

Power safety

This equipment is supplied with mains lead however if you wish to use a mains cables of your choice refer to the following information:
Refer to the rating label on rear of the unit and always use a suitable mains cord.
The unit should ALWAYS be earthed.
Please use-compliant 60320 C13 TYPE SOCKET. When connecting to supply outlets ensure that appropriate sized conductors and plugs are used to suit local electrical requirements.
Maximum cord length should be 4.5m(15').
The cord should bear the approval mark of the country in which it is to be used.
Additionally:
The appliance coupler is used as the disconnect device, ensure that it is connected to an unobstructed wall outlet.
Connect only to an AC power source that contains a protective earthing (PE) conductor.
Only connect units to single phase supplies with the neutral conductor at earth potential.
When mounted in a rack ensure that the earthing is reliable and the electrical supply is not overloaded.

ATTENTION! This product must always be earthed.
CAUTION! No user-serviceable parts inside. In the event of damage to the unit contact Solid State Logic. Service or repair must be done by qualified service personnel only.

This product complies with the following United Kingdom Legislation:
UK Electrical Equipment (Safety) Regulations 2016 (SI 2016/1101)
UK Electromagnetic Compatibility Regulations 2016 (SI 2016/1091).
The Eco-design requirements for Energy related products (ErP) 2009/125/EC.
The Restriction of the use of certain Hazardous Substances in Electrical and Electronic Equipment Directive (RoHS2) 2011/65/EU.

This product complies with the following European Union Harmonisation Legislation:
EU Low Voltage directive (LVD) 2014/35/EU,
EU Electromagnetic Compatibility directive (EMC) 2014/30/EU.
The Eco-design requirements for Energy related products (ErP) 2009/125/EC.
The Restriction of the use of certain Hazardous Substances in Electrical and Electronic Equipment Directive (RoHS2) 2011/65/EU.

Electromagnetic Compatibility
BS EN 55032:2015, Class B. BS EN 55035:2017.

WARNING: The audio input/output ports are screened cable ports and any connections to them should be made using braid-screened cable and metal connector shells to provide a low impedance connection between the cable screen and the device.

Electrical Safety
IEC 62368-1:2018, BS EN IEC 62368-1:2020+A11:2020, CSA CAN/CSA-C22.2 No. 62368-1 3rd Ed., UL 62368-1 3rd Ed.

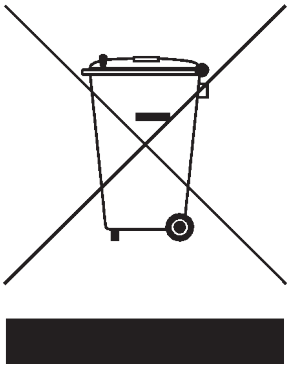
FCC Certification
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
For the user
Do not modify this unit! This product, when installed as indicated in the instructions contained in the installation manual, meets FCC requirements.
Important: This product satisfies FCC regulations when high quality shielded cables are used to connect with other equipment. Failure to use high quality shielded cables or to follow the installation instructions may cause electromagnetic interference with appliances such as radios and televisions and will void your FCC authorisation to use this product in the USA.
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
—Reorient or relocate the receiving antenna.
—Increase the separation between the equipment and receiver.
—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
—Consult the dealer or an experienced radio/TV technician for help.

Industry Canada Compliance
This Class B digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

WARNING: Cancer and Reproductive Harm -
www.P65Warnings.ca.gov

Environmental

Temperature: Operating: +1 to 30°C. Storage: -20 to 50°C.
For additional information visit www.solidstatelogic.com.



WEEE Notice

The symbol shown here, which is on the product or on its packaging, indicates that this product must not be disposed of with other waste. Instead, it is the user's responsibility to dispose of their waste equipment by handing it over to a designated collection point for recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or where you purchased the product.

Super 9000

Solid State Logic
OXFORD • ENGLAND