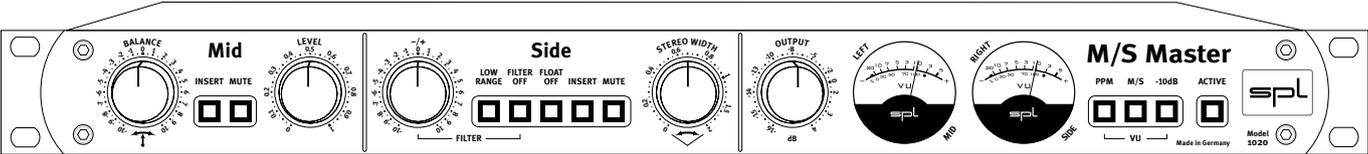


Manual



M/S Master

Model 1020

Manual M/S Master, Model 1020

Version 1.2 – 1/2012

Developer: Wolfgang Neumann

This manual contains a description of the product. It in no way represents a guarantee of particular characteristics or results of use. The information in this document has been carefully compiled and verified and, unless otherwise stated or agreed upon, correctly describes the product at the time of packaging with this document.

Sound Performance Lab (SPL) continuously strives to improve its products and reserves the right to modify the product described in this manual at any time without prior notice. This document is the property of SPL and may not be copied or reproduced in any manner, in part or fully, without prior authorization by SPL.

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The construction of the MS Master, Model 1020, is in compliance with the standards and regulations of the European Community.



Notes on Environmental Protection

At the end of its operating life, this product must not be disposed of with regular household waste but must be returned to a collection point for the recycling of electrical and electronic equipment. The wheelee bin symbol on the product, user's manual and packaging indicates that. The materials can be re-used in accordance with their markings. Through re-use, recycling of raw materials, or other forms of recycling of old products, you are making an important contribution to the protection of our environment. Your local administrative office can advise you of the responsible waste disposal point.



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Symbols and Notes



IN THIS MANUAL A LIGHTNING SYMBOL WITHIN A TRIANGLE WARNS YOU ABOUT THE POTENTIAL FOR DANGEROUS ELECTRICAL SHOCKS – WHICH CAN ALSO OCCUR EVEN AFTER THE MACHINE HAS BEEN DISCONNECTED FROM A POWER SOURCE.



AN EXCLAMATION MARK (!) WITHIN A TRIANGLE IS INTENDED TO MAKE YOU AWARE OF IMPORTANT OPERATIONAL ADVICE AND/OR WARNINGS THAT MUST BE FOLLOWED. BE ESPECIALLY ATTENTIVE TO THESE AND ALWAYS FOLLOW THE ADVICE THEY GIVE.



The symbol of a lamp directs your attention to explanations of important functions or applications.

Attention: Do not attempt any alterations to this machine without the approval or supervision of SPL electronics GmbH. Doing so could nullify completely any and all of your warranty/guarantee rights and claims to user support.

Scope of Delivery

The scope of delivery comprises the Frontliner, the external power supply, the guarantee card and this manual.

Please keep the original packaging. In case of a service procedure the original packaging ensures a safe transport. It also serves as a safe packaging for your own transports if you do not use special transportation cases.

Important Security Information

Please note and retain this manual. Carefully read and follow all of the safety and operating instructions before you use the machine. Be doubly careful to follow all warnings and special safety instructions noted in this manual and on the unit.

Connections: Only use the connections as described. Other connections can lead to health risks and equipment damage.



Water and humidity: Do not use this machine anywhere near water (for example near a wash basin or bath, in a damp cellar, near swimming pools, or the like). In such cases there is an extremely high risk of fatal electrical shocks!

Insertion of foreign objects or fluids: Never allow a foreign object through any of the machine's chassis openings. You can easily come into contact with dangerous voltage or cause a damaging short circuit. Never allow any fluids to be spilled or sprayed on the machine. Such actions can lead to dangerous electrical shocks or fire!

Opening the unit: Do not open the machine housing, as there is great risk you will damage the machine, or – even after being disconnected – you may receive a dangerous electrical shock!

Electrical power: Run this machine only from power sources which can provide proper power in the range from 100 to 250 volts. When in doubt about a source, contact your dealer or a professional electrician. To be sure you have isolated the machine, do so by disconnecting all power and signal connections. Be sure that the power supply plug is always accessible. When not using the machine for a longer period, make sure to unplug it from your wall power socket and from the guitar amp.

Cord protection: Make sure that your power and guitar amplifier signal cords are arranged to avoid being stepped on or any kind of crimping and damage related to such event. Do not allow any equipment or furniture to crimp the cords.

Power connection overloads: Avoid any kind of overload in connections to wall sockets, extension or splitter power cords, or to signal inputs. Always keep manufacturer warnings and instructions in mind. Overloads create fire hazards and risk of dangerous shocks! →

Important Security Information

Lightning: Before thunderstorms or other severe weather, disconnect the machine from wall power (but to avoid life threatening lightning strikes, not during a storm). Similarly, before any severe weather, disconnect all the power connections of other machines and antenna and phone/network cables which may be interconnected so that no lightning damage or overload results from such secondary connections.

Air circulation: Chassis openings offer ventilation and serve to protect the machine from overheating. Never cover or otherwise close off these openings. Never place the machine on a soft surface (carpet, sofa, etc.). Make sure to provide for a mounting space of 4-5 cm/2 inches to the sides and top of the unit when mounting the unit in racks or on cabinets.

Controls and switches: Operate the controls and switches only as described in the manual. Incorrect adjustments outside safe parameters can lead to damage and unnecessary repair costs. Never use the switches or level controls to effect excessive or extreme changes.

Repairs: Unplug the unit from all power and signal connections and immediately contact a qualified technician when you think repairs are needed – or when moisture or foreign objects may accidentally have gotten in to the housing, or in cases when the machine may have fallen and shows any sign of having been damaged. This also applies to any situation in which the unit has not been subjected to any of these unusual circumstances but still is not functioning normally or its performance is substantially altered.

In cases of damage to the power supply and cord, first consider turning off the main circuit breaker before unplugging the power cord.

Replacement/substitute parts: Be sure that any service technician uses original replacement parts or those with identical specifications as the originals. Incorrectly substituted parts can lead to fire, electrical shock, or other dangers, including further equipment damage.

Safety inspection: Be sure always to ask a service technician to conduct a thorough safety check and ensure that the state of the repaired machine is in all respects up to factory standards.

Cleaning: In cleaning, do not use any solvents, as these can damage the chassis finish. Use a clean, dry cloth (if necessary, with an acid-free cleaning oil). Disconnect the machine from your power source before cleaning.

Hook Up

Be very careful to check that the rear chassis power selection switch is set to the correct local line voltage position before using the unit (230 V position: 220-240 V/50 Hz, 115 V position: 110-120 V/60 Hz)! When in doubt about a source, contact your dealer or a professional electrician.



Before connecting any equipment make sure that any machine to be connected is turned off. Follow all safety instructions on pages 4 and 5 and read further information on connections on pages 7-10.

Place the unit on a level and stable surface. The unit's enclosure is EMC-safe and effectively shielded against HF interference. Nonetheless, you should carefully consider where you place the unit to avoid electrical disturbances. It should be positioned so that you can easily reach it, but there are other considerations. Try not to place it near heat sources or in direct sunlight, and avoid exposure to vibrations, dust, heat, cold or moisture. It should also be kept away from transformers, motors, power amplifiers and digital processors. Always ensure sufficient air circulation by keeping a distance of 4-5 cm/2 inches to the sides and top of the unit.



M/S Stereophony

Our ability to identify the direction and distance of a sound source is the essence of spatial hearing. The human ear can identify level and time differences from ear to ear very precisely and use that information to localize sound. At frequencies up to 1500 Hz the ear analyzes basically time differences to localize sound, while above this frequency it uses level differences.

Our hearing provides excellent conditions to apply room information even to artificially generated sounds. Regardless of the deficiencies and differences that loudspeakers and headphones might present during playback, the human ear needs only the signals to be codified in, at least, two channels, in order to be able to identify time and level variations, which result in spatial hearing.

This sort of recording and playback that includes spatial information is known as stereophony (from Greek stereos = solid or three-dimensional). The resulting stereo image is called panorama. Besides the two-channel stereophony there are several other formats of stereophony. The common conception of „stereo“ as a two-channel recording is thus incorrect.

Equally incorrect is the concept that the encoding of a stereo signal is always done in a right and a left channel. This idea is based on the fact that we have a right and a left ear and that all two-channel recording and playback systems use the same right/left format. It is also not true that all recordings are made with a microphone for the left channel and a microphone for the right channel.

The differences between the most important microphone techniques have much more to do with level and time differences. Due to the advantages and disadvantages that each technique provides, more often than not they are combined during production to achieve L/R playback.

While there are several stereo techniques that can be applied during miking, for signal processing during production there is only one technique that is actually useful: M/S. „M“ stands for Middle (or Mid) and „S“ for Side, which means that signals are separated from the middle to the sides, instead of from left to right. M/S can be actually applied during recording: two microphones with different polar patterns record direct and spatial information.

– Besides the microphone technique, M/S can also be used as an alternative stereo encoding for signal processing, which means that signals do not necessarily need to be recorded with the M/S microphone technique to be able to apply M/S encoding afterwards (at the mastering stage, for example).

In fact, M/S encoding can be generated from L/R encoding by summing and subtracting signals:

$$M = L + R, S = L - R$$

The sum of the left and right signals in the Mid signal corresponds to the mono signal of the L/R encoding. The Side signal is also created from the L/R signal by inverting the polarity of the right channel. The sum of phase-inverted signals results in the cancellation of mono information in the signals summed; thus, the Side signal is made up of the differences between L and R. The detailed formula may be clearer: $M = L + R, S = L + (-R)$. The minus sign stands for the phase inversion.

It is also possible to create a L/R signal encoding from an M/S encoding by summing and subtracting the signals, what is usually called M/S decoding:

$$L = M + S, R = M - S$$

Mathematically, the sum and subtraction of signals guarantees a lossless conversion from L/R to M/S and back to L/R, which is a very important aspect for using M/S encoding for signal processing.

M/S encoding is also used for VHF radio transmission. In this case, the Mid signal is sent with much higher energy. If the reception is not very good, a stereo receiver can switch to mono to retain the most important information. A mono receiver will always receive a mono compatible signal.

Equally beneficial is M/S encoding when using „Joint Stereo“ compression with MP3. As long as there is almost no information in the side signal, the compression rate can be higher as with L/R encoding.

Thus, in audio production M/S encoding is the best way to ensure full mono compatibility. M/S encoded signals provide an adequate way to control and ensure mono compatibility: the reduction of the Side signal results in the increase of the mono signal.



M/S Mastering

The use of a mid (M) and a side (S) signal instead of the usual L/R signal results in a much wiser musical processing.

High-energy Mid signals (vocals, snare, bass guitars, etc.) can be easily separated from Side signals (guitars, keyboards, cymbals, etc.). When mastering sum signals, M/S encoding is often the best option to be able to target single elements within a mix.

The M/S Master allows you to directly correct the balance in the mid frequency range and improve the depth and transparency of stringed instruments. Thanks to the inserts you can also use filters and effects (compressors, EQs, De-essers) more precisely. Thus, elements like vocals can be processed without affecting the overall ambience — removing vocal sibilance doesn't affect cymbals, for example. On the other hand, the stereo image can also be enlarged without affecting the mono information. Not to mention the fantastic possibilities to process ambience that M/S encoding provides.

M/S Master

- Analog tool for M/S encoding
- Active control of M/S mix ratio
- Seamless integration of external processors
- One-button insertion of outboard gear in the M/S or L/R path
- Different VU-meter modes
- Low cut filter for the Side signal
- FLOAT function for better mono compatibility

Application examples

- Stereo image enhancement after mixdown or during mastering
- Reverb and ambience reduction without losing brilliance
- Independent processing of rhythmic elements, pads and other sounds placed off the center of the stereo image without affecting central elements, and viceversa.
- Precise EQ processing of elements that sound too dull
- Specific dynamic correction of lively parts
- Dynamic reduction in Side elements without affecting drum transients

Signal Connections

Turn off the unit before connecting or disconnecting any cable or equipment to it. Otherwise you risk the possibility of damaging your ears or equipment.



Input and Output Electronics

The input and output electronics of the M/S Master possesses two very distinctive features:

1. Bridge circuits that keep the signal flow constant, regardless of malfunctioning equipment and power outages (power fail safety by relay hard bypasses).
2. External processors connected to the INSERTs can be used for A/B stereo processing without the need of any recabling.

The bridge and insert circuits rely on high-quality relays. Contact surfaces are gold-plated to provide better conductivity and encapsulated to avoid external influences due to climate or atmospheric conditions.

Power fail safety is only provided under two conditions:

1. If the M/S Master is operated in single mode without processors at its inserts, the insert send/return sockets have to be bridged with XLR patch cables.
2. If the M/S Master is operated together with inserted processors, the inserted processors must have relay hard bypasses, too. Otherwise these machines can break off the signal flow (also refer to the next chapter „MID INSERT, SIDE INSERT“).



MID INSERT, SIDE INSERT

Both MID and SIDE channels have insert points that enable you to integrate external processors in each channel's path. The INSERT SEND outputs the signal to the external processor; the processed signal is then input back through the INSERT RETURN.

IMPORTANT: If there are no processors closing the loop, the inserts have to be bridged with XLR patch cables. Use the shortest cables possible.

You can make a loop with one or more processors and you can even use a patchbay if needed.

IMPORTANT: Cabling does not need to be changed in order to use processors connected to the M/S Master for L/R stereo processing.

Simply disengage the ACTIVE push button on the front panel or turn off the M/S Master to use the processors as you usually would. Thus, the stereo signal is not M/S encoded but forwarded directly to the connected processors.

NOTE: The VU-meters drop considerably when you disengage the ACTIVE push button while the MID INSERT and SIDE INSERT push buttons are engaged. If the INSERT push buttons are not engaged, the VU-meter remains active. This applies to all VU-meter modes and is based on the complex relay circuits of the inputs, outputs, insert points, and L/R and M/S encoding. Considering that the push button setting described does not correspond to an actual work function, it can be neglected.



XLR sockets

All signal connections are made via balanced XLR connectors. Inputs are always female and accept male connectors; outputs are always male. All in all, a very comprehensible principle.

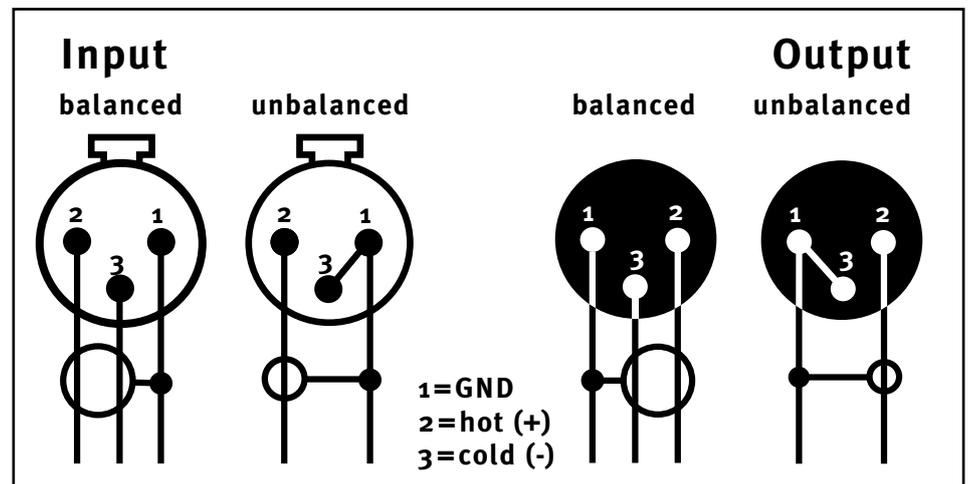
Balanced connections

It is impossible to exclude interferences when a single audio signal is transmitted. Shielding is effective against electric, but not against electromagnetic influences. Motors, transformers, and alternating current can always induce interferences. But even if the transmission would succeed, differences in ground potentials between driver and receiver would produce disturbances.

In balanced connections a reference signal with reversed polarity is transmitted additionally to the audio signal through a second wire. The ground signal is routed separately through a third wire. Input and output stages are drivers and receivers, and the receiving stage can suppress interferences by subtracting the difference between audio and reference signal.

Unbalanced connections

Unbalanced connections from and to RCA or 1/4" TS sockets can be made without adaptors to the balanced XLR sockets. The correct wiring is important. The diagram shows the pin configuration of the XLR sockets and how to correctly connect them for unbalanced connections:

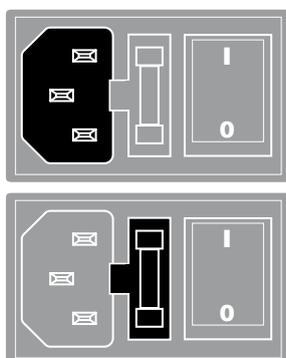


Connections to RCA sockets are always unbalanced, a wiring to jack connectors can be both balanced (1/4" TRS/stereo jack) or unbalanced (1/4" TS/mono jack). We recommend to use individually configured cables from XLR to RCA or jack sockets instead of adaptors. You can get cables in any needed configuration from audio dealers. With the diagram above, the dealer can ensure to provide the appropriate cable for your application.

Power connection and fuse

Connect the power cord to the rear MAINS INPUT socket. Transformer, power cord and case connection conform to VDE, UL and CSA requirements.

The fuse is accessible from outside and placed right behind the flap right from the socket. Fuse ratings are 315 mA slow blow (230 volts) or 630 mA slow blow (115 volts).



Voltage Selector

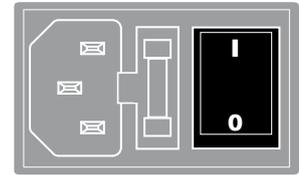
The rear panel VOLTAGE selector sets the local line voltage (115 V position: 110-120 volts/60 Hz, 230 V position: 220-240 volts/50 Hz). The diagram shows the correct switch position for 230 V power supply.

BEFORE you connect electrical power make sure that the VOLTAGE selector setting reflects the correct local power line voltage.



Power switch

Use the POWER switch on the rear panel to turn the unit on or off. The VU-meters on the front panel will light on as soon as you turn the unit on, regardless of the position of the ACTIVE push button. Thus, they fulfill a second function as power indicators.



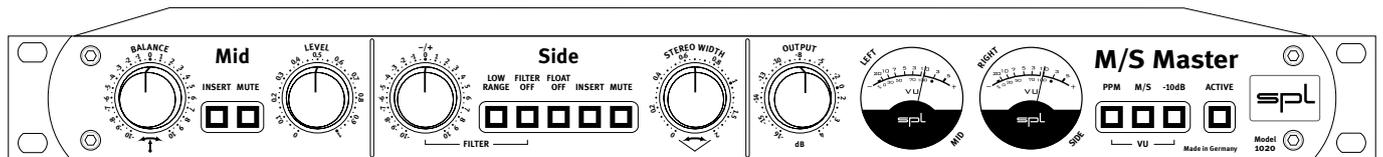
GND Lift

The rear panel GND LIFT switch eliminates hum by separating the internal ground from the unit's housing ground. Hum can, for example, result when this unit's housing has a common ground connection with other devices that might have a different ground potential. The switch is usually deactivated to retain the shielding of the housing.



Overview

Operation



Overview

The control elements on the front panel of the M/S Master are divided into three sections: MID, SIDE and OUTPUT/VU-meters.

1. In the MID section you adjust the balance of Mid signals in the stereo panorama and their level.
2. In the SIDE section you define the stereo width and apply filters as well as other functions to the signal.
3. In the OUTPUT/VU section you adjust the output level, monitor the VU-meters and switch on, with the ACTIVE push button, the M/S Master, as well as engage the insert paths

ACTIVE

Use the ACTIVE push button to switch on or off the totality of the electronic components of the M/S Master. When switched off, input signals are forwarded directly to the outputs.

The ACTIVE push button accomplishes two very important tasks:

1. A/B comparison between processed and unprocessed audio material.
2. Switching between M/S and A/B stereo processing, including external processing without the need of any recabling.

Refer to the information on „Input and Output Electronics“ and „MID INSERT, SIDE INSERT“ on page 9.

ACTIVE



Input settings

Given that all productions are mixed differently, it is impossible to provide general recommendations regarding settings. By default, settings correspond to a passive M/S encoder without applying any processing, i.e. L/R stereo is encoded as M/S stereo and the rest of the M/S Master functions have no influence on the sound. This is the best starting point to get to know the functions and settings of the unit:

MID/BALANCE: 0 (center position)

MID/INSERT and MUTE: OFF

SIDE/FILTER: 0 (center position)

SIDE/all switches: OFF

SIDE/STEREO WIDTH: 1 (around three o'clock)

OUTPUT: 0 (around three o'clock)

VU-switch: all OFF

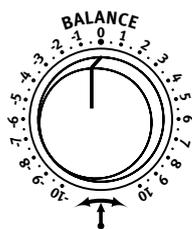
ACTIVE: ON

At this point, when you switch on or off the M/S Master processing there is no real difference in the sound. And this is where the fun begins: the original L/R signal is now M/S encoded and can be processed with the integrated as well as with external processors.

Do note that the M/S Master features exclusively high-quality potentiometers (ALPS RK 27 or „Big Blue“). But even these potentiometers can exhibit minor imprecisions. Therefore scale values can be subject to minor deviations. For a perfect 1:1 comparison with the aforementioned values you ought to consider minor tolerances and compensate if needed. The M/S Master was not conceived to provide a perfect comparison between L/R and M/S encoding. Its primary goal is individual processing of audio material, therefore, minor deviations in scale values do not have a considerable impact on the overall performance. If you wish to have a higher technical precision, you can always use specifically designed measurement equipment (phase correlation meters, etc.). We have taken these factors in consideration during development in order to keep a reasonable price/performance ratio.

Control Elements

MID section



BALANCE

Use the BALANCE control to place the Mid signal in the stereo panorama. With this control, the Mid signal created from the sum of L and R can be placed anywhere along the stereo panorama. In practice, hard left and hard right are not commonly used: normal settings are somewhere around +/- 1, and up to 3 at the most. Maximal values are meant to serve as a reference for testing loudspeakers and acoustical conditions in order to hear if both sides sound uniformly.

The M/S Master provides two measuring instruments to check Mid balance:

1. The VU-meters. If one channel is continuously higher while in L/R display mode, some adjustment might be needed.
2. A phase correlation meter (or omnimeter). Adjust the BALANCE control in order for the phase correlation meter to show a perfectly balanced central position..

MID: INSERT

Use the INSERT switch to activate the insert point for the Mid channel. You can connect any mono processor, or a single channel of a stereo unit, to the insert jacks on the rear panel. As soon as you engage the INSERT switch, the connected units are integrated into the M/S Master processing path. To use the processors independently of the M/S Master, as well as for mono or L/R processing, disengage the ACTIVE switch of the M/S Master.

Refer to the information on „Input and Output Electronics“ and „MID INSERT, SIDE INSERT“ on page 9 and „ACTIVE“ on page 11.

For more information on how to use external processors go to „Working with External Processors“ on page 18.

MID: MUTE

The MUTE push button silences the Mid signal. There is another MUTE button for the SIDE section. When you isolate either channel from the other, you can actually concentrate better and gain a more focused perspective on the audio material of that particular channel. The relation between the mixed elements is easier to distinguish and, at the same time, overprocessing becomes much more evident. Focused processing is also made easier and the control over previous work becomes very revealing.

LEVEL

Use the LEVEL control to set the Mid signal volume in relation to the Side signal. The start position is set hard right. The more you turn the control to the left, the more the volume decreases. When turned fully left, the Mid signal disappears completely.

Together with the STEREO WIDTH control in the SIDE section, the LEVEL control determines the ratio between both channels. Understanding the interdependence of these controls is essential when working with them. Thus, you should always ponder if it is more appropriate to decrease one or increase the other. For example: to expand the stereo image without losing mono compatibility, the most convenient would be to increase the STEREO WIDTH to positive values. On the contrary, if you were to decrease the LEVEL of the (Mono) Mid signal without changing the STEREO WIDTH value, mono compatibility would also be affected. Typical application examples include the need to emphasize or attenuate elements in the Mid signal, with the intention of modifying the depth of elements (like the vocals) placed at the front or back of a mix, or even to alter the relation between Mid and Side elements.

In this last case, and as described above, the LEVEL and STEREO WIDTH controls provide optimal conditions to make delicate adjustments. When it comes to localization, as in the first case, it is interesting to know that the depth of a signal is strongly influenced by high-frequency, monophonic differences, which are then shaped by the ear. Sounds above 1.5 kHz coming from in front of the receiver are more intensely reflected by the ear and are responsible for a good directivity. Given this, processing the relevant frequency range in the Mid signal with an EQ connected to the MID INSERT can help modify positioning. Signal presence is intensified by emphasizing frequencies between 1.5 kHz and 2 kHz, which results in a small increase in the overall level.

Dynamic differences throughout the audio material are one of the most common situations that require correcting. For example, the level of vocals usually changes when the song goes from the verse to a chorus, so it might be necessary to control the dynamics. The high quality of the potentiometers is evident on their perfectly adjusted torque – dynamic adjustments are thus much more carefully controlled.

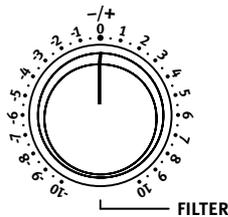
Mid

INSERT MUTE

**Mid**

INSERT MUTE





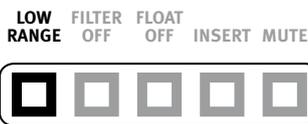
-/+ FILTER

The „-/+“ knob controls the only actual effect on the M/S Master: a shelving filter meant to boost or attenuate low and mid frequencies in the Side signal. The frequency range below the given cut-off frequency is equally boosted. Use the LOW RANGE push button next to it to set one of two possible cut-off frequencies, in order to define the frequency range to be processed (see the next section).

Low and mid frequencies up to 2 kHz are very important when it comes to signal positioning, that is why the filter is set to affect this specific frequency range. As mentioned before, for frequencies up to 1.5 kHz it is time differences that define localization. Like any other filter, the „-/+“ filter affects signal phase, which results in time shifts. An increase in intensity results in an increase of the influence on the perception of the stereo image according to the scale (attenuation to the left, boosting to the right).

Thus, filtering of low and mid frequencies increases the correction and shaping possibilities with the on-board elements of the M/S Master. At the same time, the integration of an EQ in the Side insert broadens even more the possibilities to make selective frequency processing. The „-/+“ control is therefore a good complement to the STEREO WIDTH setting; the combination of both provides a wide and effective variety of processing approaches.

Side



LOW RANGE

Use the LOW RANGE push button to set the cut-off frequency of the „-/+“ filter. When engaged, the cut-off frequency is set to 800 Hz so you can process the low frequency range. When disengaged, the cut-off frequency is set to 2.2 kHz, which means that the „-/+“ filter processes all frequencies below 2.2 kHz.

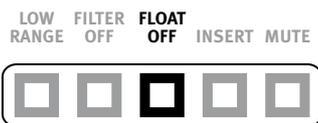
Side



FILTER OFF

Use this push button to disengage the „-/+“ filter. By disengaging the filter, the processing is done solely on the Side signal encoded directly from the original L/R signal. Thus, the actual L/R stereo image, ambience, etc. can be accurately appraised and processed if needed.

Side



FLOAT OFF

FLOAT refers to a signal created from L/R that is mixed with the Side signal. Actually, in addition to the L/R signal, from where the M/S encoding is created, a part of the L/R signal (reduced in level) is attached to the Side signal. This is done as a parallel process, i.e. it is not added to the encoded signal. This portion accounts for 10% at the most.

Mixing the FLOAT signal with the Side signal has two major advantages:

1. It avoids the risk of having a negative phase correlation ratio.
2. The less substance the Side signal has, the easier and safer the processing is with the FLOAT signal.

In relation to 1: Even extremely wide stereo images remain mono compatible. In this case, FLOAT extends the bandwidth, so a compromise between mono compatibility and stereo image is easier to reach.

In relation to 2: If the original Side signal is made up of ambience or pad sounds, processing can be very difficult. The risk of extreme settings is quite high because it is very hard to identify sonic differences clearly. Thus, the FLOAT signal provides a good sonic reference – even if only during processing. After all, the FLOAT signal can be turned off anytime (once you are done optimizing settings, for example).

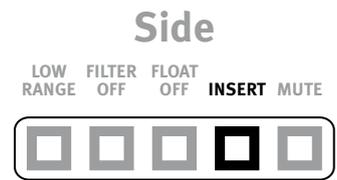
Engage the FLOAT OFF push button to listen only to the Side signal created from the M/S encoding.

SIDE: INSERT

Use the INSERT switch to activate the insert point for the Side channel. You can connect any mono processor, or a single channel of a stereo unit, to the insert jacks on the rear panel. As soon as you engage the INSERT switch, the connected units are integrated into the M/S Master processing path. To use the processors independently of the M/S Master, as well as for mono or L/R processing, disengage the ACTIVE switch of the M/S Master.

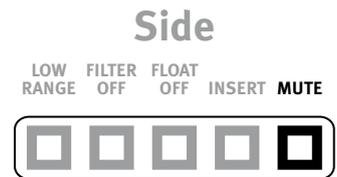
Refer to the information on „Input and Output Electronics“ and „MID INSERT, SIDE INSERT“ on page 9 and „ACTIVE“ on page 11.

For more information on how to use external processors go to „Working with External Processors“ on page 18.



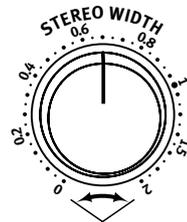
SIDE: MUTE

The MUTE push button mutes the Side signal. There is another MUTE button for the MID section. When you isolate either channel from the other, you can actually concentrate better and gain a more focused perspective on the audio material of that particular channel. The relation between the mixed elements is easier to distinguish and, at the same time, overprocessing becomes much more evident. Focused processing is also made easier and the control over previous work becomes very revealing.



STEREO WIDTH

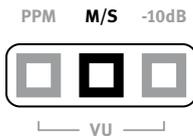
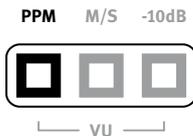
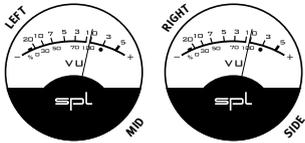
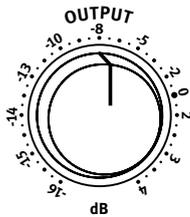
Use the STEREO WIDTH control to adjust the Side signal level in relation to the Mid signal. When set to 1 (around two o'clock) there is no difference, i.e. the signal is played back 1:1. As you turn the control to the right, the Side signal is made bigger. When set hard right (2) the stereo image is 200% wider. As you turn the control to the left, the Side signal is made smaller. When set hard left, the Side signal is muted.



Adjustment of the STEREO WIDTH should always be made taking into account the settings of the „+/-“ filter and the LEVEL control in the MID section. Understanding the interdependence of these controls is essential when working with them. Thus, you should always ponder if it is more appropriate to decrease one or increase the other. For example: to expand the stereo image without losing mono compatibility, the most convenient would be to increase the STEREO WIDTH to positive values. On the contrary, if you were to decrease the LEVEL of the (Mono) Mid signal without changing the STEREO WIDTH value, mono compatibility would also be affected.

The interaction with the „+/-“ filter is quite simple and it could almost be described as a coarse/fine adjustment: if you have already set the stereo image, you can use the „+/-“ filter to focus on the details. Please refer to „+/- FILTER“ on page XXX for more important information.

Typical applications where the use of STEREO WIDTH comes in handy are recordings with too little room ambience (in studios, for example) or too much room ambience (in places with a reverb time of more than five seconds, like churches). M/S encoding is rather useful to solve problems that are very difficult or even impossible to work through in L/R format: speech transmission during events can be easily isolated to improve intelligibility, regardless of the unfavorable acoustics of a room, hall or stadium.



OUTPUT

Use the OUTPUT control to attenuate the output signal up to -16 dB or boost it up to +4 dB, in order to match it to the following unit in the chain. The output level on the VU-meter is indicated in PPM mode. Before starting any processing, always set the OUTPUT control to 0 (around three o'clock). That way you can read the Mid and Side signal levels on the VU-meter without the output setting having any influence on them.

VU meters

The VU meters (VU = Volume Unit) measure the output level, which ranges from -20 dB to +5 dB. The meters show the changes in level caused by processing the signal with the M/S Master. The VU meters have two different operating modes: L/R or M/S. That way you can always have an accurate level reading while working with the M/S Master – including the changes in level that may be caused by external processors. You may find more detailed information under the descriptions of the „PPM“, „M/S“ and „-10 dB“ push buttons.

PPM

Use the VU/PPM push button to toggle between VU and PPM display mode. VU mode shows average level readings and therefore provides information on the overall loudness or energy of the signal.

PPM mode (PPM = Peak Program Meter) indicates peak levels, similar to AD converter meters, where it is important to control peak levels in order to avoid the converter from saturating and distorting. Sometimes it can be useful to activate the -10 dB push button while in PPM mode to extend the display range.

M/S

Use the M/S push button to toggle between L/R output level display (M/S push button disengaged) and M/S level display (M/S push button engaged).

The VU-meters are labeled „LEFT“ and „RIGHT“ respectively (left, above the meters). When in M/S mode, the labels that apply are „MID“ and „SIDE“ (right, below the meters).

In L/R mode the level shown is post output control, which means that it takes into account all processing that you have made with the M/S Master, including the OUTPUT control.

In M/S mode it shows the output signals of the Mid and Side channels respectively. That way you can see how processing, including external processors, affects level relations in M/S encoding. Level changes produced by the OUTPUT control are not shown in M/S mode. To keep track of the L/R output level switch to L/R mode (M/S push button disengaged).

-10 dB

Use this push button to reduce 10 dB the sensitivity of the VU-meters. When the VU-meters' needle points at 0 db, it actually corresponds to -10 dBu and the maximum value is +15 dB. The sensitivity switch allows you to analyze very high level signals that would otherwise be beyond the range of a normal meter.

PPM M/S -10dB



ACTIVE

Use the ACTIVE push button to switch on or off the processing electronics of the M/S Master. When switched off, input signals are forwarded directly to the outputs.

ACTIVE



The ACTIVE push button accomplishes two very important tasks:

1. A/B comparison between processed and unprocessed audio material.
2. Switching between M/S and A/B stereo processing, including external processing without the need of any recabling.

Refer to the information on „Input and Output Electronics“ and „MID INSERT, SIDE INSERT“ on page 9.

We will describe in detail the two most common types of processing units used: compressors (to process dynamics) and equalizers (to correct or shape signals based on frequency).

You can obviously connect all sorts of processors to the inserts of the M/S Master: reverb and delay effects, a De-esser in the MID INSERT to reduce vocal sibilance, tube processors to add character to the sound... Whatever suits your needs.

Compressor

Compressors are usually used at the mastering stage to increase level across the entire frequency spectrum. Loud level peaks are attenuated and the dynamic range of the mix as a whole is reduced. Afterwards, the signal's average level is increased to the original value.

This conventional use of a compressor might or might not work, it depends. Over the last two decades, dynamic range reduction has steadily increased; almost at the same pace as sonic quality has decreased – insofar as musically oriented dynamic relationships are used as benchmark. When optimizing dynamic structures, M/S encoding offers significant advantages over the across-the-board approach of sum compression in L/R format. M/S encoding allows you to focus on single elements of finished mixes, making it easier to increase overall loudness while preserving the dynamic range.

Let's take, for example, a pop song that sounds fairly balanced, even though the vocals are a bit too high within the mix. With a compressor in the MID INSERT, you can reduce the level of the vocals as one of the main elements in the Mid signal. Backing vocals and harmonic instruments, as well as all other elements of the Side signal, are left untouched.

The compressor's „Auto Gain“ or similar functions should be avoided. Make-up gain shouldn't be necessary either. Otherwise, the (mono) Mid signal could become too loud and other central instruments like bass drum, snare, bass guitar, etc. could result too imposing. Unless, of course, the Mid signal needs a push to come through in the mix due to a very dominant Side signal. When it comes to depth (front/back positioning), there are some EQ techniques that are very useful and do not affect the overall level too much. Read the section „Equalizer“.

You can always compress a loud Side signal if there are certain instruments that stand out too much in that channel. The mix will sound more balanced and compact without affecting the dynamic range and transient structure of the snare and bass drum.

Heavy compression on the Side signal can be also useful to enhance the room ambience of a mix.

Equalizer

The possibilities that an equalizer provides when working with the Mid or Side signals correspond to the normal applications of an EQ, the full scope of which is beyond our purpose.

Two of the most common functions of an EQ ought to be more than enough to illustrate the potential of using it as an INSERT: attenuation of low frequencies and boosting of high frequencies.

Among the most common problems of a mix are booming synth pads and guitar walls with a very deep frequency response. They can make a Side signal too dense or clash with important low frequency signals – like bass guitar and bass drum – usually found in the Mid signal. With an EQ in the MID and/or SIDE INSERT you can focus on that specific frequency range in order to avoid conflicts. The Mid signal is thus cleansed and the primal elements become more precise and distinguishable. Selective EQ can give the Side signal more air, making cymbals and harmonic instruments sound more present without adding too much sharpness to vocals.

Increasing high frequencies in the Side signal usually results in a wider stereo image with a solid center image.

Another interesting possibility is the processing of individual elements of a mix to affect positioning. The depth of a signal is strongly influenced by high-frequency, monophonic differences, which are then shaped by the ear. Sounds above 1.5 kHz coming from in front of the receiver are more intensely reflected by the ear and are responsible for a good directivity. In this situation, an EQ can be used to process the frequency range in question (generally speaking, this will affect Mid signals so you will have to use the MID INSERT). Signal presence is intensified by emphasizing frequencies between 1.5 kHz and 2 kHz, which results in a small increase in the overall level.

Inputs & Outputs

Electronically balanced instrumentation amplifiers

Sockets:	XLR
Input impedance:	20 kOhm balanced/10 kOhm unbalanced
Output impedance:	150 Ohm balanced/75 Ohm unbalanced
Max. input level:	20 dBu
Max. output level:	20 dBu

Measurements

Frequency response (-3 dB):	10 Hz - 100 kHz
Common mode rejection ratio: (@ 1 kHz, 0 dBu input level and unity gain)	> 60 dB
Total harmonic distortion & noise: (@ 1 kHz, 0 dBu input level and unity gain)	0,007 %
Signal to noise ratio (A-weighted):	-82 dB
Dynamik range (unweighted):	102 dB

Power supply

Toroidal transformer

Fuses:	230 V AC, 50 Hz: 315 mA; 120 V AC, 60 Hz: 630 mA
Voltage selector:	115V/230V
Power consumption:	@ 230 V: 9,1 W/10,8 VA; @ 115 V: 5,6 W/7,1 VA

Dimensions and Weight

Housing (W x H x D): (depth including controls and sockets)	482 x 88 x 320 mm
Weight:	3,6 kg/7,94 lbs

Notes: 0 dBu = 0,775 V. Specifications subject to change without notice.

Copy Master Recall Settings



Artist:

Engineer:

Album/Gig:

Track(s)/Groups:

Title:

Date:

