PASSEQ

Passive Mastering Equalizer



- Test Report
- Manual / Handbuch

PASSEQ

Passive Mastering Equalizer



Manual

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Version 1.2 – 12 / 2017

Developer: Wolfgang Neumann

This manual includes a description of the product but no guarantee as for specific characteristics or successful results.

Unless stated otherwise, everything herein corresponds to the technical status at the time of delivery of the product and user manual by SPL electronics GmbH.

The design and circuitry are under continuous development and improvement.

Technical specifications are subject to change.

Package Contents

PASSEQ Passive Mastering Equalizer

Power cord

Manual

The PASSEQ Equalizer is available in different colors.

Black:	Modell 1650
Red:	Modell 1654

Do consider keeping the original packaging. It can come in very useful whenever you need to transport your gear. If there is ever the need to send it in for repair, the original packaging guarantees a safe shipment.

The SPL PASSEQ Mastering Equalizer was designed, developed and manufactured in Germany.

King of the passive equalizers

The PASSEQ Mastering Equalizer is a dual-channel, passive equalizer.

The PASSEQ Mastering Equalizer – Model 1650/1654 is a new revised edition of the well-known SPL Passeq – Model 2595.

Both units are based on our 120V Rail Technology. The new PASSEQ Mastering Equalizer features the same high-quality characteristics as the previous model, though it was revised and optimized to fulfill all requirements of a Mastering Equalizer.

The Passeq of the first generation was the first passive equalizer which provides three separate frequency ranges for the boost and the cut stages. With 12 switchable frequencies per band, totaling 36 boost and 36 cut frequencies, the Passeq was the most powerful passive EQ system ever made. The new PASSEQ Mastering Equalizer features the same amount of cut and boost frequencies, though the choice of frequencies was changed and the Q-factor was individually newly adjusted for every selectable frequency with an optimal coil, condenser, resistor combination. Each boost and cut frequency now got an individual optimized Q factor. Especially the mid bands are much more harmonious for working on program material than they were on the previous model. When we were fine-tuning, through component selection, within countless listening sessions, the focus was on receiving musically sounding curves, which are clearly on par with legendary devices like the Pulteq EQ from the decades of the 1950's and 60's, but without all disadvantages of a 60-year-old original, like a high noise level and most of all a very limited choice of frequencies.

All passive filter components (variable resistor, capacitor and coil) deliver excellent sonic characteristics. An important part of this process is played by coil and condenser loading and saturation characteristics. The resulting inertia in contrast to the characteristically extremely fast reaction of active filters is the reason for pleasant, beneficial sonic characteristics. We tend to perceive these attributes in terms of an increased suppleness and transparency, with perceptibly improved, silky highs and warm and punchy basses.

Another highlight of the new PASSEQ is the HF+ Band, which was expanded with the frequencies 25kHz and 35kHz, sounding so incredibly good, that you don't want to turn it off anymore.

Thanks to the big detented output control, you can increase or attenuate the output level by 10dB, to reach following devices with the perfect desired level. This is important, especially when it comes to mastering. A fader ranging from 0dB to limitless, like the previous model provided, would not be helpful in this case. With the PASSEQ you can also adjust the parameters Gain, Q (HF +) and Output in 41 steps with the detented potentiometers. All other parameters can be adjusted with 12-position switches. Thanks to these switches and detented potentiometers, a precise recall is very easy to realize.

In addition to that, the handling of the PASSEQ Mastering Equalizer was improved through small corrections of the positioning and naming of the control elements. Like all new SPL Mastering devices, the new SPL PASSEQ provides an Auto Bypass. Of course each of the two channels can also be manually activated or deactivated with the big illuminated pushbuttons. Thanks to the Auto Bypass, this can also be realized automatically in a freely selectable time frame.

Technical Aspects

120 Volt Technology

SPL‘s goal was to push analog signal processing to the limits. That‘s why we combined the best possible components with a high-grade optimized circuit design.

We have been using the in-house developed 120-volt technology - the highest-ever operating voltage used for audio applications - in all our products from the Mastering series for years. Some of the most highly respected Mastering studios today revolve around SPL consoles and signal processors from our Mastering series (Bob Ludwigs Gateway Mastering & DVD in the USA, Simon Heyworth‘s Super Audio Mastering in the UK, Galaxy Studios in Belgium, and the legendary Wisseloord in the Netherlands, for instance).

The 120-volt technology is based on op-amps developed internally by SPL‘s co-founder and Chief Developer Wolfgang Neumann. The PASSEQ features the most advanced generation of these op-amps. They boast with even better tech specs thanks to the thermal behavior optimization they underwent under the hands of Bastian Neu.

Ultimately, the supply voltage is key for the overall dynamic response of a processor. Voltage is to an electrical circuit what cylinder capacity is to an internal combustion engine:

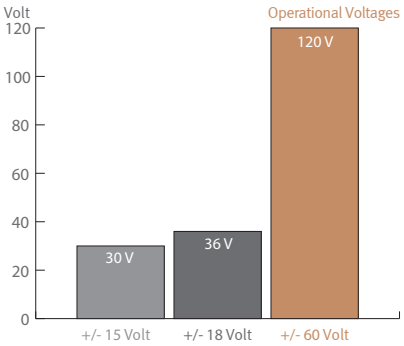
You can‘t replace cylinder capacity with anything else, except more cylinder capacity.

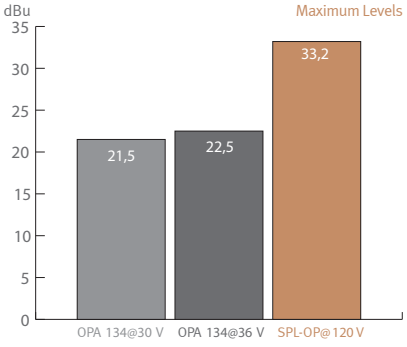
120 Volt Technology - Diagrams

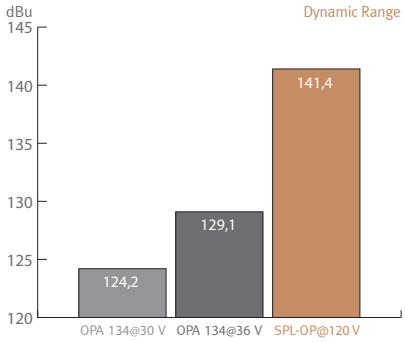
These diagrams clearly show the advantages of our 120-volt technology in comparison to other circuits with a lower operating voltage. The direct relation between operating level and maximum level is fundamental for the classification: the higher the operating level, the higher the maximum level a circuit can handle. And since virtually all essential acoustic and musical parameters depend on this relation, a higher operating voltage also

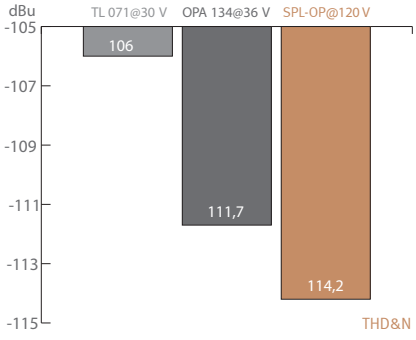
has a positive impact on the dynamic range, distortion limit and signal-to-noise ratio. The result is a clearly more laid-back and natural sound with less unpleasant coloring.

Do bear in mind that dB scales do not represent linear but rather exponential increases. A 3 dB increase corresponds to doubling the acoustic power, +6 dB correspond to twice the sound pressure level, and +10 dB correspond to twice the perceived loudness.









When it comes to volume, the 120-volt technology exhibits a performance that is twice that of common components and circuits, in regard to maximum level and dynamic range, with values that are approximately 10 dB higher. THD measurements of the SPL op-amps show a difference of more than 3 dB compared to the OPA134 at 36 V — in terms of sound pressure level, that corresponds to an improvement of more than 50%.

The operating level most commonly used for audio equipment is 30 volts.

The Basics of Frequency Filtering

Filter Types

There is basically only one type of filter used in the PASSEQ: The bell-filter or peak-filter. But since the center frequency of the peak-filter, concerning the HF and LF bands, is only marginally within the perceptible hearing range, these filters auditorily and visually rather correspond to shelf-filters.

Shelf Filters

A shelf filter increases or decreases the energy of all frequencies above or below a chosen frequency. Depending upon the direction of processing one refers to high frequency (HF) or low frequency (LF) shelf filters. Beginning with the threshold frequency, the frequency band is boosted or cut much like a shelf. The maximum boost or cut achieved at the point furthest from the threshold frequency. The threshold frequency is usually about 3 dB less (with the overall increase set to maximum). This gives the typical rising form of the shelf filter's response curve.

Peak Filters

A peak filter boosts or cuts a chosen frequency's energy with a maximum amplitude and a definable frequency range around this frequency with a fall off of up to 3 dB to both sides. The chosen frequency with the maximum amplitude is called center frequency—it takes place in the middle at the peak of the response curve. The response curve forms a bell, thus peak filters are also often referred to as bell filters

Bandwidth

The width of a frequency range or band is musically defined in octaves. The technical counterpart to this is the "Quality" of a filter, and the abbreviated "Q" is the most common value for the bandwidth of a filter.

A high Q value means a narrow bandwidth while a smaller Q factor corresponds to a wider one:

Bandwidth 2 Octave: 0.7 Q

Bandwidth 1 1/3 Octave: 1 Q

Bandwidth 1 Octave: 1.4 Q

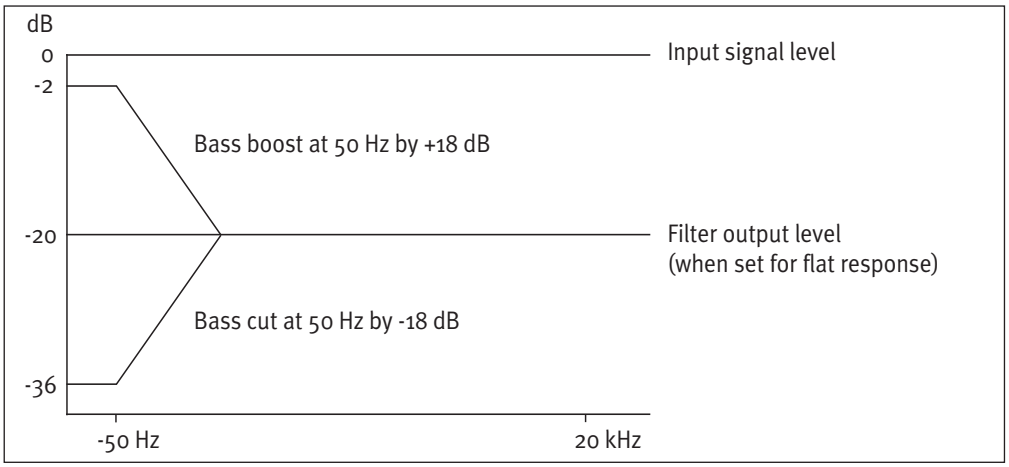
Bandwidth 1/2 Octave: 2.8 Q.

Passive EQs

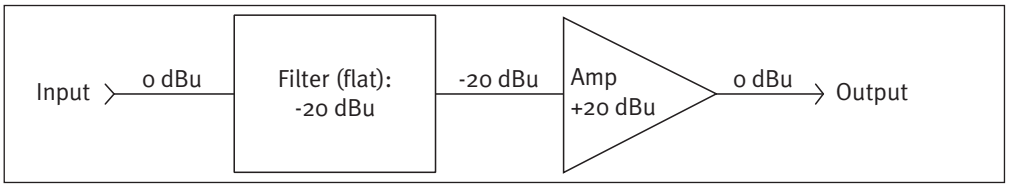
A filter in a passive network got no amplification elements and therefore does not need any external power. That is why you can only attenuate the energy of the frequencies. However, to change the energy of the frequencies of a passive filter network in both ways (attenuate and increase), the signal level of the filter input signal gets reduced by a certain value. Proceeding from this value, an additional attenuation (cut) or an increase (boost) of the reduced condition can be put into effect. A passive filter is always followed by an amplifier which regains the initial energy of the attenuated signal level – though it is not part of the actual filter circuit.

Passive filters react differently than active filters, mostly due to the saturation and loading characteristics of its coils and condensers. The characteristics of passive filters often are very advantageous in their ability to create a musically pleasing sonic result: they sound comparably very smooth and harmonious.

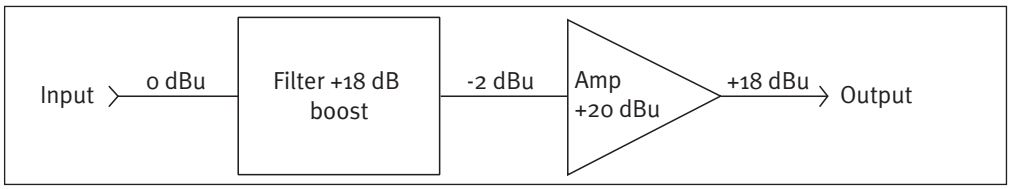
Schematic of a passive frequency filter



Block diagram of passive filter set flat



Block diagramm of a passive filter at +18 dB boost



Installation

Voltage Selection

Before connecting the PASSEQ to the mains, make sure that the voltage selection corresponds to the values of your local power grid (230 or 115 volts). Inside the power connector, to the right, next to the on/off switch, there is an opening that displays the voltage selected. If the voltage indicated does not correspond to the one required, change it by following this procedure:

Open the power connector lid with a small screwdriver (use the tiny slots on the right hand side). Use the screwdriver to lever the red fuse holder from above until you can grab it. Take the fuse holder out and replace the fuse with one corresponding to the local power grid specifications. You can find the adequate values on the rear of the unit or on page 16 of this user‘s manual. Turn the fuse holder around 180 degrees and place it back again. When you close the lid again, you should see the correct voltage displayed in the opening.

First Steps

Before turning on the PASSEQ you must first connect the included 3-pin power cord to the 3-pin IEC socket. The transformer, power cord and IEC socket all comply to the VDE, UL and CSA regulations.

The PASSEQ should not be installed in close proximity to equipment that emits magnetic fields or emanates heat. Avoid exposure to heat, moisture, dust, and vibrations. Do not install the PASSEQ close to any power amps or digital processors. Instead, install it in a fully „analog rack” where any interferences can be avoided (Word Clock, SMPTE, MIDI etc.).

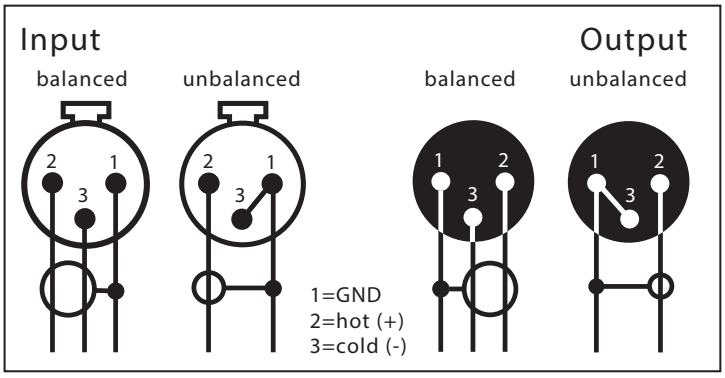
The unit should be powered off before connecting or disconnecting any cables or equipment to it.

Use the On/Off switch on the rear panel to turn the unit on or off. The illuminated red LED in the middle of the front panel indicates the unit‘s operating status. The On/Off switch was placed on the rear panel to avoid any emissions due to voltage-carrying conductors running across the unit and affecting sound. When powering on or off, there‘s no need to observe a specific sequence regarding the connected devices. However, like with any audio signal chain, power amplifiers should always be powered on last and powered off first. The PASSEQ can be powered on and off with the use of a circuit breaker, as long as the total load does not exceed the rating of the latter.

XLR inputs and outputs

We used exclusively Switchcraft/Neutrik XLR input and output plugs to guarantee perfect connectivity in the studio. They provide an optimal connection thanks to their electromechanical design and large contact surface.

The image shows the XLR connectors pinout. They are balanced and have three conductors or wires. Conductor 2 (Pin 2) corresponds to the (+) or hot Signal.
In case an unbalanced connection is necessary, the correct polarity of the conductors needs to be observed.



Ground Lift switch to avoid ground loops

On the rear panel of the PASSEQ Mastering Equalizer (see page 10) is also a „GND LIFT“ (Ground Lift) switch to avoid any ground loops. Ground loops take place when gear connected in the same network have different potentials.

The GND LIFT switch disconnects the equipment ground from the service ground to avoid such problems. The Ground Lift function is activated (= equipment ground disconnected) when the switch is depressed.

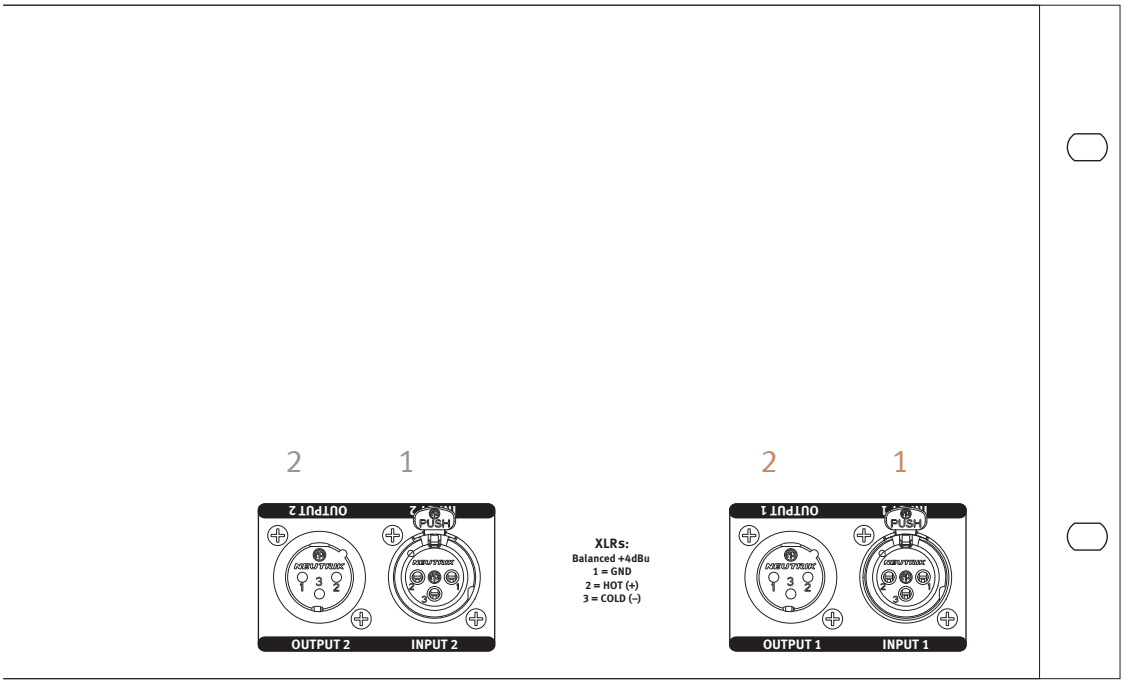
Cabling: Rear Side

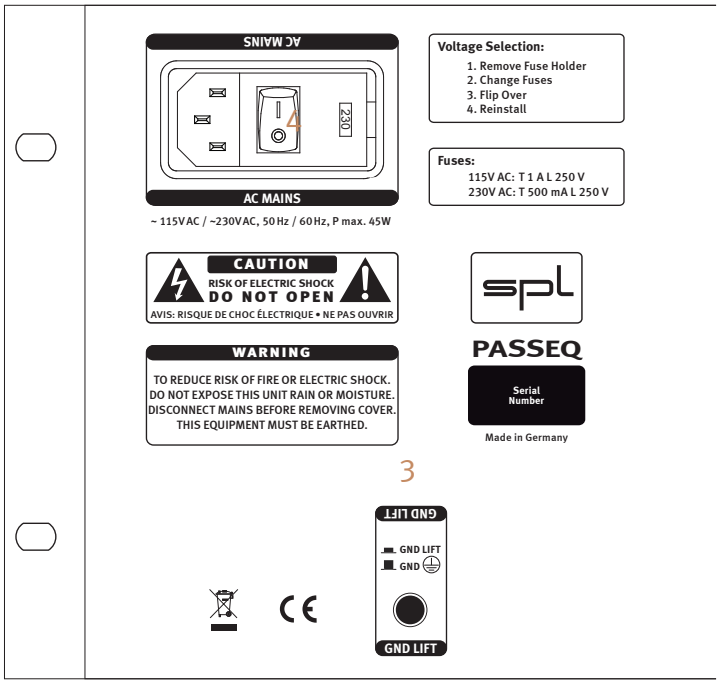
1 Input

2 Output

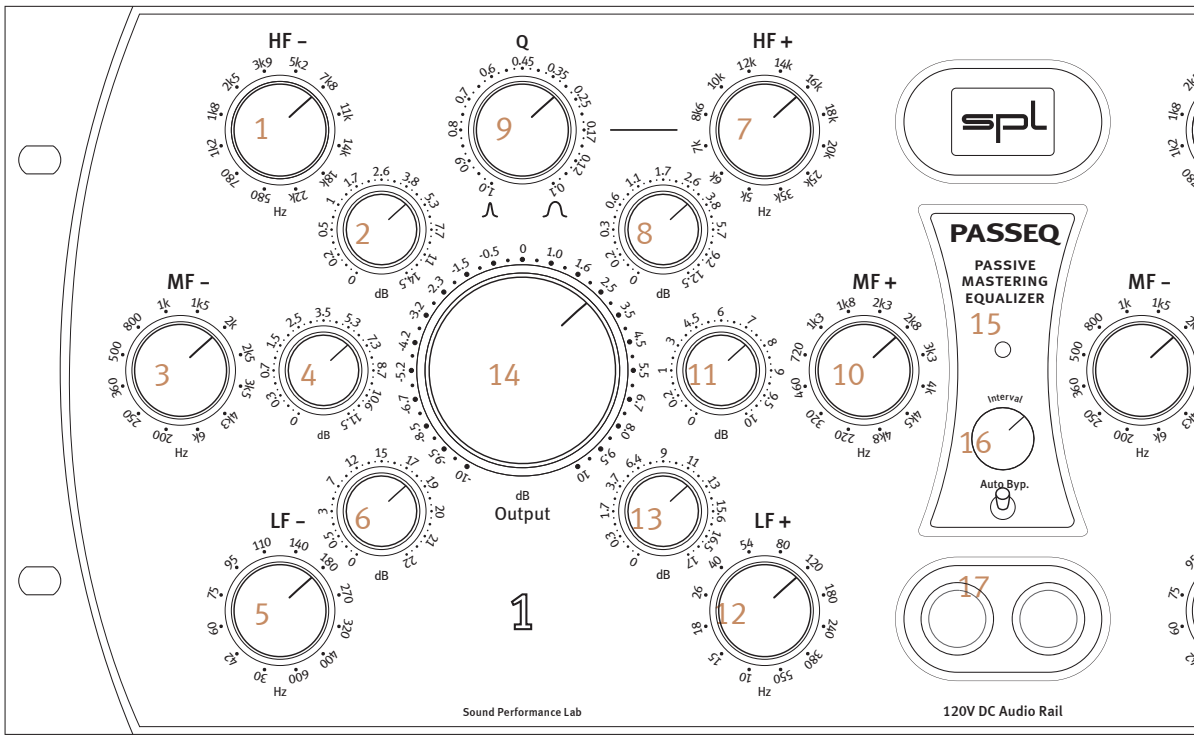
3 Ground Lift (see details on page 9)

4 Voltage (see details on page 8)





Control Elements



1 HF- Frequency

2 HF- Gain

3 MF- Frequency

4 MF- Gain

5 LF- Frequency

6 LF- Gain

7 HF+ Frequency

8 HF+ Gain

9 HF+ Q

10 MF+ Frequency

11 MF+ Gain

12 LF+ Frequency

13 LF+ Gain

14 Output

15 Power LED

16 Auto Bypass

17 Channel Switch

Layout of Control Elements

Initially one might be struck by the circular arrangement of the PASSEQ's control elements. As unusual as this first appears, the more understandable and clearer this layout becomes when one looks closer.

Along with the fact that we simply like this design from an aesthetical view, this layout makes even more sense with respect to the idea of the passive EQ concept itself: In a passive design, filters for boosting and cutting a frequency range are physically separated from each other. Reflecting this fact, the elements left of the central output control perform level cuts, while controls to the right of this central regulator serve as signal boost controls. Cut and boost switches are positioned next to the appropriate frequency band selector and frequency bands are arranged from low to high from the standpoint of both physical and frequency range layout.

Frequency

Each channel provides three cut and three boost frequency switches. You can choose 12 different frequencies per switch. The workable frequency range stretches from 10 Hz to 35 kHz.

Frequency Range:

- LF- (Low Frequencies Cut): 30 Hz bis 600 Hz
- LF+ (Low Frequencies Boost): 10 Hz bis 550 Hz
- MF- (Mid Frequencies Cut): 200 Hz bis 6 kHz
- MF+ (Mid Frequencies Boost): 220 Hz bis 4,8 kHz
- HF- (High Frequencies): 580 Hz bis 22 kHz
- HF+ (High Frequencies): 5 kHz bis 35 kHz

LF+ and LF-

The LF- frequency range extends from 30 Hz to 600 Hz. The low boost LF+ band encompasses a range of 10 Hz to 550 Hz. The maximum available increase in this LF+ boost band is 17 dB, while the maximum reduction of the LF- band is 22 dB. Optically these filter bands may be represented as having a shelving characteristic with an 6 dB slope. Passive filters do not allow for direct alteration of the slope gradient because this quality is pre-determined by component selection and not, as with active filters, by a variable value. The lowest frequencies begin here with 10 Hz, then follow with 15 Hz, 18Hz, 26Hz, 40 Hz, and so on. At this point one might think that such a lavish set of frequency choice in this range might be a bit overdone, as there is acoustically a rather limited amount of audio material of any real significance below 26 Hz. However, these choices are anything but arbitrary. These frequencies represent a consistent -3 dB point of a sloping down response curve. That is, the gentle 6 dB slope also allows frequencies above 10 Hz to be processed. As mentioned in other parts of this text, special condenser/coil/resistor filter networks have been designed for each frequency range. The choice of one or the other inductances produces differences in sonic coloration even when limited differences between frequencies such as 10 Hz or 15 Hz play a subordinate role. Along with this differing phase relationships may come into play and affect tonal color. Because modern productions often demand a definite number of choices in an engineer's options for achieving an optimal result in bass emphasis, the PASSEQ has been designed with a very complete set of low frequency options to insure realizing these goals.

MF+ and MF-

The midrange bands elevate the PASSEQ to a complete combination of filter options that classic passive designs do not offer. Both midrange bands exhibit peak filter characteristics, that is, when viewed from the boost band, the frequency curve appears as bell-shaped slopes above and below the chosen frequency range. The slope or Q-value is, again, not variable, but attuned through the choice and configuration of the passive filter‘s components for a maximum in musical ef ciency, relying in the PASSEQ on its developer, Wolfgang Neumann‘s years of musical experience. The middle bands‘ peak structure is chosen for a clean separation of LF and HF bands. Were the choice here to be for a shelving filter design, too many neighboring frequencies would be processed, with resulting undesirable influences extending into LF and HF bands. Along with this is the simple fact that a midrange peak filter characteristic is accompanied by a more easily focused center point processing of critical voice and instrument fundamental frequencies.

HF+ and HF-

PASSEQ’s high frequency bands have a different layout for the cut and boost ranges: The HF- cut band exhibits a (wide-band) shelving characteristic, while the HF+ boost band exhibits a variable Q, peak filter characteristic.

As seen above, one can also note and intensification in choice of frequencies in the high range. Here the same reasons apply as in prior cases: Individually designed and constructed coil-condenser-resistor configurations result in slightly differing sonic characteristics.

Q (HF+ Band)

Like already mentioned in the last chapter, with the HF+ Band you got the possibility to change the Q-factor (value), thus the bandwidth, thanks to the Q-control. The control range here ranges between 0.1 Q and 1.0 Q. Again all settings can be adjusted through a 41 step detented potentiometer.

With the proportional or variable Q principle, boost control settings would apply only if the HF+ Q were to be set at Q=1.0 (control set fully clockwise). Were the value to be reduced (thus increasing the bandwidth), the boost would also be reduced. This can lead to a situation wherein, for example, a HF+ Q setting of 0.1 and a boost of 3dB would result in effectively no audible boost in the chosen frequency—at this value the Q value resides at about 0.3dB. With this Q value, don’t hesitate to turn turn up the HF+ band boost control to its full 12.5 dB setting—this results in an actual overall increase of around 3.5 dB. Narrower Q settings, for example, to 0.6, result in further level boosts again. The advantage of a Proportional-Q design compared to Constant-Q design rests with the musically superior way it functions. The acoustic energy below the bell-shaped curve remains essentially the same and thereby it retains the balance of high frequencies in relation to the entire frequency spectrum while experimenting with different Q values. While it is true that one must think independently of the scaled gain dB values of the HF+ boost switch in such cases (because these only apply to a Q value of 1), the result is a simpler, more musically sensible and worthwhile way to work that does not require continual additional corrections of the Q values.

Control Elements

Gain

The maximum increase or attenuation of the amplitude is adjusted to the according frequency range for each frequency band. The setting can be selected with detented potentiometers in 41 steps.

Maximum change in amplitude:

- LF- (Low Frequencies Cut): 22 dB
- LF+ (Low Frequencies Boost): 17 dB
- MF- (Mid Frequencies Cut): 11,5 dB
- MF+ (Mid Frequencies Boost): 10 dB
- HF- (High Frequencies): 14,5 dB
- HF+ (High Frequencies): 12,5 dB

Output

Located at the center of both sides, you will find the Output controls. The Output controls serve as an output level regulator for the respective side, to increase or attenuate the output level up to 10dB. These controls are also 41 step detented potentiometers.

Channel Switch

The two, centrally located, orange-lit switches activate or deactivate the corresponding left and right channels.

Auto Bypass

To be able to make an objective judgment of the processed material, it is best not to have to be toggling between the original and processed signals by yourself, but rather have it done automatically. Plus, the fact that you do not have to move from the sweet spot and can concentrate better on the music to optimally assess the processing is a huge advantage. The Interval control determines the time that needs to elapse before the compressor toggles between the processed and unprocessed signals. Hard left is the shortest setting. To increase the interval, turn the knob clockwise.

Basic Approaches and Working Techniques

While we would never assume that in creative and artistic work there should be absolute rules, and this also applies to work with EQ: There is no such thing as “The Voice” or “The Kick Drum” or “The Piano”. The following is thus offered strictly as a basic orientation or starting point for such work, and should not be misconstrued as dogma or any other kind of absolute.

Nonetheless, in order to achieve sometimes hard-to-define goals when applying EQ, it really is important to be aware of and be able to use a few accepted basic musical and technical guidelines.

EQ Yin & Yang

1) A small reduction in the lower middle range around 250 Hz can have a similar effect as an increase in the presence region of 5 kHz.

2) Added energy in the very high region of 15-20 kHz can create the impression of having made the bass and lower mids thinner.

3) Adding warmth to a voice will reduce its mix presence.

Working with EQ and this Yin and Yang principal means ideally to consider always such implied repercussions of work in one frequency—for example, that in working to enhance warmth, that one might want to avoid losing presence.

Harshness in the upper middle to lower high range can be countered with more than one approach: A harsh trumpet section may be improved through a reduction around 6-8 kHz, oder with an increase at around 250 Hz. Both of these measures result in a warmer sound, but the decision of which to use should depend on which of the two also works best in the entire mix.

Moreover, one should never forget how easy it is, while working intensely with isolated elements of a mix, to fall into the trap of forgetting how such elements can influence, for better or worse, the rest of the mix.

First cut, then boost

“The ear” is more used to energy reductions in a frequency range, thus boosts attract more attention. That is, a 6 dB boost is perceived to be similar in amount to a 9 dB cut. Therefore when wishing to emphasize one frequency, it is typically better first to consider a reduction in others. The result will bring more transparency and clarity as well as reduce possible unwanted coloration of the signal.

Specifications

Measurements

Inputs

Max. Input Level ..... + 32,5 dBu

Input Inpedance ..... 20 kOhms (balanced)

Outputs

Max. Output Level ..... + 32,5 dBu

Output Inpedance ..... ‹ 600 ohms (balanced

Harmonic Distortion: at -30 dBu: 0,076%

at -20 dBu: 0,026%

at 0 dBu: 0,026%

at +10 dBu: 0,0086%

at +30 dBu: 0,0012%

Noise (unweighted, Gain +0 dBu, EQ = 0dB B/C) ..... - 91,8 dBu

Noise (A-weighted, Gain +0 dBu, EQ = 0dB B/C) ..... - 95,2 dBu

Noise (CCIR, Gain +0 dBu, EQ = 0dB B/C) ..... - 86,2 dBu

THD & N (Gain +0 dBu, EQ = 0dB B/C) ..... › 102 dB

Common-Mode-Rejection:..... › -60 dBu

(at 1 kHz, Gain +0 dBu, EQ = 0dB B/C)

Transmission Bandwidth: 10 Hz-200 kHz

(-3 dB)

Frequency Range: 30 Hz-35 kHz

Power Consumption: ..... 0,06 Amp, 230V/50Hz, 9,5 Watt, 13,6 VA

0,09 Amp, 115V/60Hz, 9,5 Watt, 13,6 VA

Fuses ..... 230 V/50 Hz: 0,5 Amp

115 V/60 Hz: 1 Amp

Dimensions

Standard EIA 19 Inch Housing/4U ..... 482 x 177 x 311,5 mm / ca. 19“ x 7“ x 12,25“

Weigh ..... 10,2 kg / 22,5 lb

Connections

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

Water and humidity

Do not use this device anywhere near water (for example in a bath room, a damp cellar, near swimming pools, or similar environments). Otherwise your are dealing with an extremely high risk of fatal electrical shocks!

Insertion of objects or fluids

Be careful to not insert any object into any of the chassis openings. You can otherwise easily come into contact with dangerous voltage or cause a damaging short circuit. Never allow any fluids to be spilled or sprayed on the device. Such actions can lead to dangrous electrical shocks or fire!

Ventilation

The vent openings on the unit are meant to avoid the PASSEQ from overheating. You should never cover nor block these openings.

Power Supply

Power the unit exclusively with the voltage rating specified on the unit. In case of doubt, contact your local dealer or electric provider. Disconnect the unit from the electric power grid if you are not going to use it for a long period of time. Unplug the power chord from the mains to cut power supply to the unit. Always make sure that the mains plug is easily accessible.

Opening the unit

Simply put: DON‘T, if you are not a certified SPL technician or engineer. Really: Do not open the device housing, as there is great risk you will damage the device, or – even after being disconnected – you may receive a dangerous electrical shock!

Cord protection

Make sure that your power and audio 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 signal inputs. Always keep manufacturer warnings and instructions in mind. Overloads create fire hazards and risk of dangerous shocks!

Lightning

Before thunderstorms or other severe weather, disconnect the device from wall power; do not do this during a storm in order to avoid life threatening lightning strikes. Similarly, before any severe weather, disconnect all the power connections of other devices and antenna and phone/network cables which may be interconnected so that no lightning damage or overload results from such secondary connections.

Security Advices

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 reached inside the housing, or in cases when the device 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 device is in all respects up to factory standards.

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 device from your power source before cleaning

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 wheelie bin symbol on the product, user‘s manual and packaging indicates that. The materials can be reused in accordance with their markings. Through reuse, 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.

WEEE Registration: 973 349 88.

Contact

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Declaration of CE Conformity

The construction of this unit is in compliance with the standards and regulations of the European Community.

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