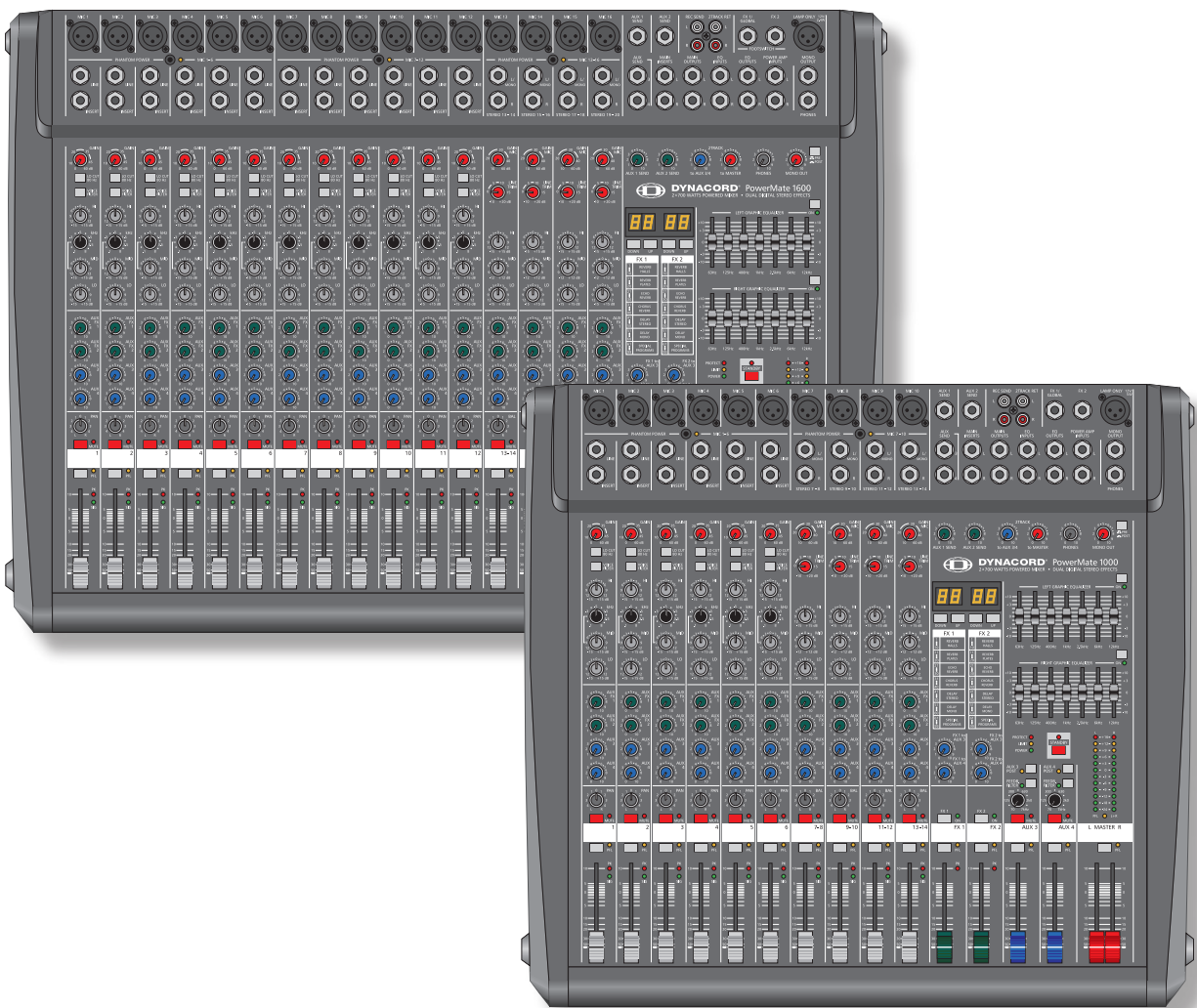


DYNACORD®

OWNER'S MANUAL

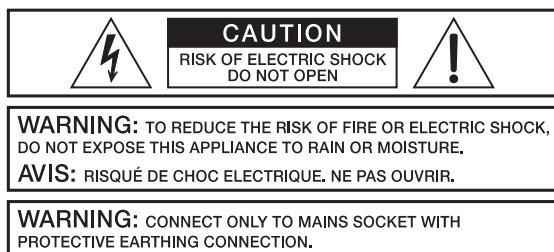


PowerMate 1000/1600 Power Mixer

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IMPORTANT SAFETY INSTRUCTIONS



The lightning flash with arrowhead symbol, within an equilateral triangle is intended to alert the user to the presence of uninsulated „dangerous voltage“ within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with a dry cloth.
7. Do not cover any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or the grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Unplug this apparatus during lightning storms or when unused for a long period of time.
13. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
14. Do not expose this equipment to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the equipment.
15. To completely disconnect this equipment from the AC Mains, disconnect the power plug from the AC receptacle.
16. The mains plug of the power supply cord shall remain readily operable.

IMPORTANT SERVICE INSTRUCTIONS

CAUTION: These servicing instructions are for use by qualified personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the Operating Instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

1. Security regulations as stated in the EN 60065 (VDE 0860 / IEC 65) and the CSA E65 - 94 have to be obeyed when servicing the appliance.
2. Use of a mains separator transformer is mandatory during maintenance while the appliance is opened, needs to be operated and is connected to the mains.
3. Switch off the power before retrofitting any extensions, changing the mains voltage or the output voltage.
4. The minimum distance between parts carrying mains voltage and any accessible metal piece (metal enclosure), respectively between the mains poles has to be 3 mm and needs to be minded at all times. The minimum distance between parts carrying mains voltage and any switches or breakers that are not connected to the mains (secondary parts) has to be 6 mm and needs to be minded at all times.
5. Replacing special components that are marked in the circuit diagram using the security symbol (Note) is only permissible when using original parts.
6. Altering the circuitry without prior consent or advice is not legitimate.
7. Any work security regulations that are applicable at the location where the appliance is being serviced have to be strictly obeyed. This applies also to any regulations about the work place itself.
8. All instructions concerning the handling of MOS - circuits have to be observed.

NOTE:



SAFETY COMPONENT (MUST BE REPLACED BY ORIGINAL PART)

DESCRIPTION

First of all, we would like to thank you and congratulate you to your purchase of a DYNACORD power mixer.

The PowerMate compact power mixers incorporate profound know-how, based on our research, development and inter-communication with our customers in the professional audio market, for decades. With a PowerMate you own a power mixer that offers a wide range of functionality in a very compact frame. Forget about the troubling experiences with cabling and matching mixers, amplifiers, FX units, and equalizers. You now own a device with optimally matched components. The mixer's ergonomic console shape and clearly structured controls provide perfect overview for instant access at all times. A gooseneck litlight can be easily plugged into the provided socket to compensate for insufficient lighting conditions. Also during the transport you will quickly learn to appreciate the PowerMate's superiority: recessed handles on the sides, compact dimensions and low weight, plus the sturdy cover that protects the controls from being damaged. However, if you would rather like to install your PowerMate 1000 in a 19" rack shelf, no problem. The only thing you have to do is to replace the plastic side panels by a pair of metal rack mount ears. Through its multiple functions, its high dynamic capacity, and extremely low-noise design in combination with its 24-bit Dual-Stereo effect unit and the high-performance power amplifier, the PowerMate is best equipped for universal use. No matter, whether on-stage, in a home recording environment or in a permanent installation, your PowerMate is the ideal partner to meet your expectations of a professional audio device – effective and reliable. Of course, you want to install and operate your new PowerMate as quickly as possible. Nevertheless, please take the time to do this by means of this user's manual. Starting with input channels, effects and master areas up to the power amp, every section is explained systematically and in detail within this owner's manual. Through the careful perception of the manual you will learn about all functions and find some useful and practical tips for the daily operation of the PowerMate. Even more important, you will find some adjustment guidelines that should be painstakingly carried out; plus the description of a typical sound reinforcement installation, a block diagram, specifications, connection guidelines, etc.... So, take your time and keep on reading.

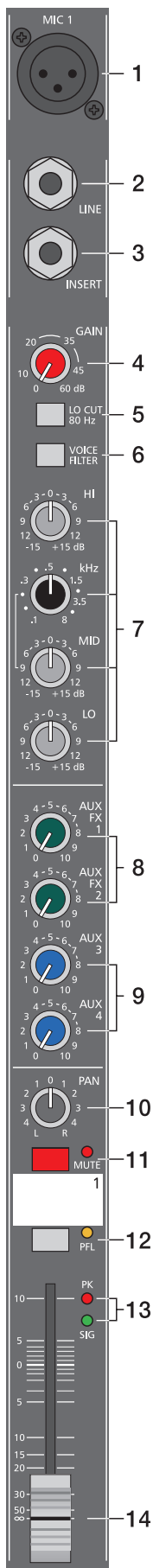
Unpacking and Warranty

Open the packaging and take out the PowerMate. Remove the FX unit displays' protective foil. In addition to this owner's manual you will find the mains supply cord and the warranty card. Please check, if the warranty registration form is filled out correctly. Only when this form is completed, you will be able to apply for warranty claims. DYNACORD grants 36 months of warranty, starting with the date when you received the appliance from your local dealer. Therefore, we would like to ask you to also keep the original certificate of purchase together with the warranty certificate.

Keeping all papers and the original packaging of the device is generally recommendable, since they come in handy re-selling an appliance.

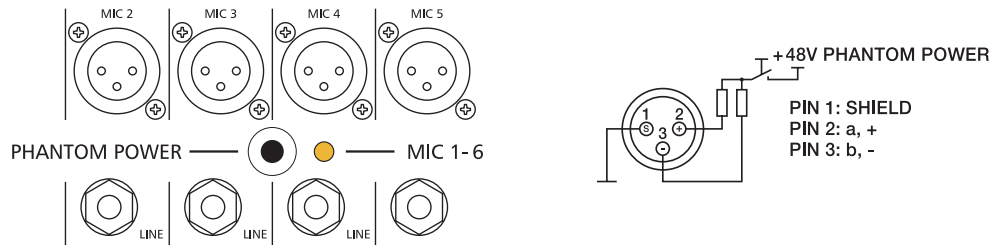
Installation and Connections

Do not cover the ventilation louvers in the bottom plate of the appliance. Always place the PowerMate on an even surface to allow for sufficient airflow during the operation. The device is equipped with electronically controlled ventilators to protect the power amplifier against thermal overload. The direction of the airflow is front-to-rear. Fresh, cold air enters the mixer at its lower front side and warm air leaves the device through the ventilation louvers in the rear panel. Do not cover the frontal or the rear ventilation louvers. Otherwise the PowerMate automatically enters protect mode to prevent thermal overload. While the protect mode prevents that the device is being damaged, regular operation is impossible during the period of time it is activated. In case the PowerMate is installed in a 19" rack system (vertically), you have to allow at least 2 HU of free space above and 1 HU below the mixer. Of course you can cover the empty space with special blind plates that also have ventilation louvers. Before establishing the mains supply connection, please make sure that the device matches the voltage and frequency of your local mains supply. Check the label next to the mains switch. When switching the power on, the internal fans will run for about 2 seconds at full speed to give you an acoustical signal that the PowerMate is ready to be operated. In addition dust particles that might have gotten into the device get blown out. For a secure connection the SPEAKER OUTPUTS on the rear panel of the PowerMate are provided through professional standard high-performance SPEAKON connectors. The pin assignment of these sockets is 1+ (hot) and 1- (cold).



1. MIC

Electronically balanced XLR-type inputs for the connection of low impedance microphones like the ones featured in major studio and live mixing consoles. This type of input stage provides extraordinary low noise signal conversion at an extremely low distortion rate (typical <math><0.002\%</math>) even in the high frequency range. Generally, any type of microphone can be connected as long as its pin assignment is in accordance to the diagram shown below. When condenser microphones are connected, you have to press the PHANTOM POWER (MIC 1-6) button, which is located in the input section. The microphone gets its operating voltage (+48Vdc) through the mixer and you can forget about battery replacement times.



CAUTION: Always connect the microphones before turning on the phantom power or switching the PowerMate on with phantom power being activated. This is the only way to prevent your microphones from being damaged. Also make sure to engage the STANDBY button in the master section to prevent yourself and your environment from nasty power-on noise. Simultaneous connection of condenser type microphones and dynamic microphone models is generally possible with phantom power being activated. Before you do so, please consult the manual of the concerned microphone. The MIC input accepts levels between -60dBu ... $+21\text{dBu}$ – depending on the setting of the corresponding gain control. Because of their low impedance design and the phantom power these XLR-type inputs are not suitable for cascading other mixing consoles or the connection of FX units, keyboards or other electronic equipment. When connecting this kind of equipment, please use the LINE level inputs.

2. LINE

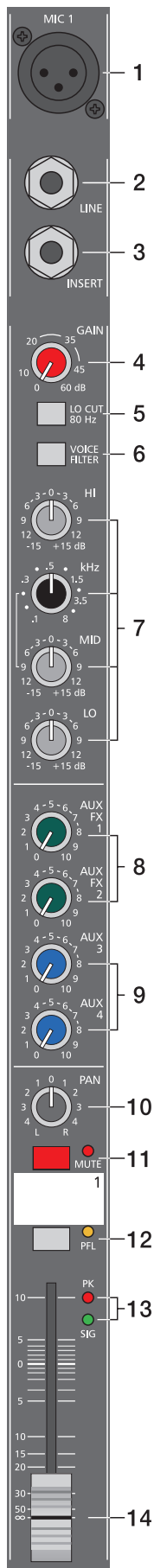
Electronically balanced inputs for the connection of electronic instruments, such as keyboards, drum machines, E-guitars and E-basses with an active output, as well as all other high level signal sources, like additional mixers, FX units, CD players, etc. The LINE input accepts levels between -40dBu ... $+41\text{dBu}$. The connection of balanced or unbalanced signal sources is established through monaural or stereo phone plugs, assigned according to the diagram below. If the device that you want to connect has a balanced output stage, the use of balanced cables with stereo phone plugs is preferable. This type of connection is greatly insensitive to the induction of external noise or HF interference.



Do not connect identical signal sources to LINE and MIC inputs at the same time, since the signals would interfere with each other, resulting in level reduction.

One more note: Please, do not connect E-guitars or E-basses with passive, high impedance outputs directly to a LINE input. The LINE inputs of the PowerMate – like the Line level inputs of mixers from other manufacturers – are designed for the connection of the relatively low source impedance of electronic instruments. The reproduction of the instrument's original sound characteristics will be unsatisfactory. Connect those instruments using a special transformer or pre-amplifier with very high input impedance. Musical instruments with an active electronic output (battery-powered) can be connected without any problems.

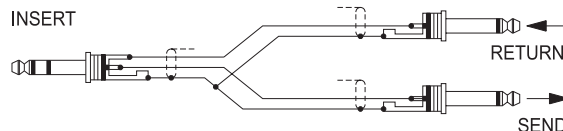
INPUT MONO



When connecting signal sources, please make sure to set the corresponding channel faders or at least the master faders to their minimum positions or engage the **STANDBY** button. This will save you, your audience, and the equipment from extensive wear from unpleasant pops.

3. INSERT

Stereo phone jack with breaker function. The low impedance output is assigned to the tip (send) and the high impedance input (return) is assigned to the ring. This jack allows the connection of external compressors, limiters, EQs, de-noisers, etc. into the corresponding channel's signal path. The insertion point is post gain controls, Lo-Cut filters, and voicing stage and pre sound shaping section and channel faders. You have to use a stereo phone plug – according to the diagram aside – in case you intend to use this jack as a true insert bus.



When using the insert socket as a **DIRECT OUT** (Pre EQ), the stereo phone plug's tip and ring have to be short circuited, so that the audio signal is not interrupted. If you are using a monaural phone plug instead, you will get a **DIRECT OUT** with breaker function – the signal flow within the channel is interrupted.



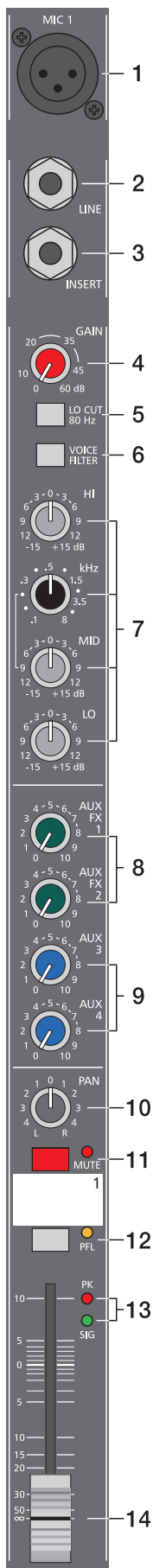
4. GAIN

Rotary control for adjusting a MIC/LINE input's sensitivity. These controls let you optimally adjust the incoming signals to the mixer's internal operation level. Cautious adjusting offers the benefits of an improved S/N-ratio and provides you with the full bandwidth of the PowerMate's outstanding sound capabilities. On the XLR-type connectors an amplification of 0dB is achieved when the control is set all the way to the left and +60dB when the control is set all the way to the right. Especially when dealing with very low input levels – during vocal recordings or when the sound source is located in a distance – the high gain is extremely profitable. Using the LINE-input, the signal is generally attenuated by -20 dB while maintaining the total adjustment range of 60dB. The LINE-input's unity gain – no amplification (0 dB) – is achieved at the 20dB mark. The following is meant as a short note for your assistance on how to determine the right input level:

Setting Instructions:

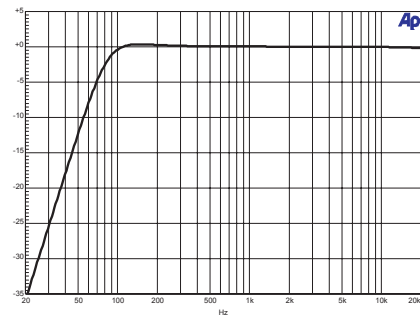
1. Set the gain control and the corresponding channel fader to their minimum values.
2. Connect the desired sound source (microphone, musical instrument, etc.) to the desired MIC or LINE input.
3. Start the reproduction of the sound source at the highest volume level to be expected – respectively sing or speak as loud as possible directly (short distance) into the microphone.
4. While playing the sound source or singing into the microphone, adjust the input level using the gain control, so that during the loudest passages the **PEAK** LED is just not lit, but the **SIGNAL** present LED lights constantly.

This is the basic channel setting, leaving you with at least 6 dB of headroom, i.e. you have at least a range of 6dB before signal clipping occurs. In case you intend to make further adjustments to the channel's EQ setting, you should perform steps 3. and 4. again afterwards, since changes in the sound shaping section also have an influence on the channel's overall level.



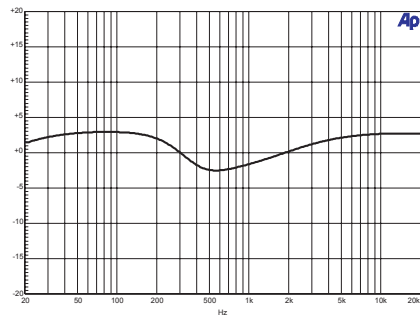
5. LO CUT 80 Hz

When the LO CUT switch is engaged, frequencies below 80 Hz are attenuated (18 dB octave slope). In most cases using the LO CUT filter with microphone channels is a good advice, since it efficiently suppresses popping sounds, rumbling noise and low-frequency feedback. The only exceptions are kick drum and acoustic bass. Sometimes it can be also very effective to combine the LO CUT filter with the voicing filter. For instance to provide vocals with more “body”, without getting additional low pitched noise. Activating the LO CUT and raising the bass level (LO EQ) provides you with a richer sound, without additional rumbling or popping noise. Another welcome side effect is, that the power amplifier and the connected loudspeakers do not get “polluted” with unnecessary low-pitched interference. Your audience will be thankful for the use of the LO CUT filter, too, since in this way they can enjoy a truly clear, natural, and powerful sound performance.



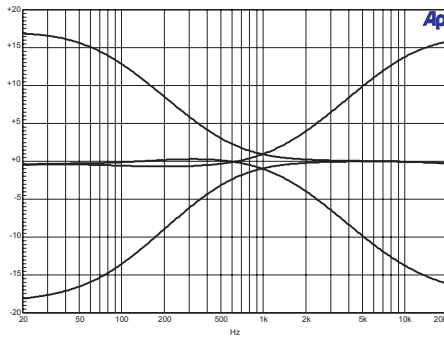
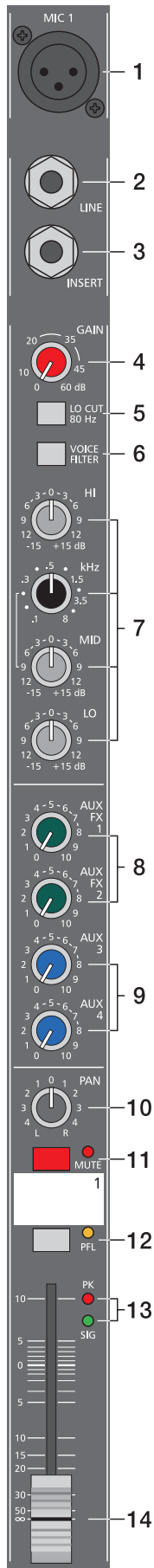
6. VOICING FILTER

This button activates an asymmetric microphone filter, which can be used in addition to the channel EQ. The voicing filter enhances the first harmonic oscillation and the treble of the human voice while slightly attenuating the mid frequency range. This voice shaping method provides powerful vocals that are clearly emphasized from the rest of the mix. This “pre-shaping” is not achievable using ordinary third or octave band equalizers. The use of this filter is not restricted to vocals only. Horns, woodwinds, and other acoustic instruments can profit from the voicing filter as well. We leave it entirely up to your creativity and imagination to try the VOICING filter with as many different sound sources, as you want. Normally, you do not have to fear any problems with the occurrence of feedback.

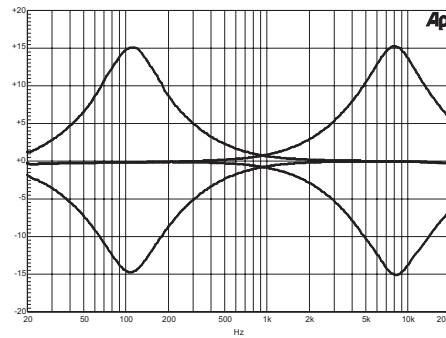


7. EQ SECTION

The mixer’s EQ section allows very differentiated shaping of the incoming audio signal within miscellaneous frequency bands. Turning one of the EQ level controls to the right enhances/amplifies the corresponding frequency range while turning it to the left lowers/attenuates the signal of that specific frequency band. Before you begin to alter the sound, all EQ controls should be set to their neutral position, i.e. their marker points straight up (locked in place). Try not to set the EQ controls to extreme positions. Usually, minor changes are totally sufficient and produce the best results in the overall sound. You should use the natural reproduction as an orientation mark and rely on your musically trained ear. The moderate use of the MID control is the best remedy to avoid acoustical feedback. Especially in this frequency range you should try to avoid excessive enhancement. Lowering the level more or less in this band will provide you with high amplification rates without feedback. Use the LO control according to your pleasing, to add more “punch” to the sound of a kick drum or “body” to the vocals. Use the HI control in the same way to provide cymbals and the human voice with more treble and a more transparent sound. The MID EQ section offers parametric EQ-setting via separate rotary controls for the adjustment of level (MID) and frequency band (kHz) in the range between 100 Hz and 8 kHz.



LOW-HI EQ



MID EQ

Adjustments in the MID frequency range are certainly the most effective way to shape the sound. As a matter of fact, determining the correct center frequency is not always as easy as it seems. Here is one method – amongst others – how to quickly find the right setting of the parametric EQ for your application:

Setting Instructions:

1. Slightly lower the channel fader to avoid feedback.
2. Turn the MID rotary control all the way to the right (+15dB).
3. Play the desired sound source or talk into the microphone.
4. While doing so turn the frequency rotary control (kHz) slowly from left to right.
5. Surely and within no time, you will detect the frequency range that is not to your liking or causing the feedback.
6. Leave the frequency control in this position and turn the MID control to the left until the sound is natural or to your liking.

8. AUX / FX 1/2

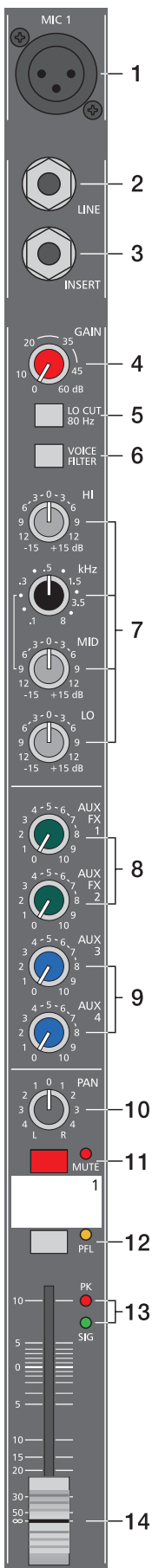
The AUX/FX controls allow adjusting individual amounts of the input signals to be routed to the integrated FX1 or the FX2 effects units. The signal path is split post volume fader – POST FADER – so that the fader setting also influences the amount of the signal that is fed to the FX units. Using the AUX/FX controls lets you easily assign an effect for groups of musical instruments or vocals. For example, you can assign a short reverb effect of the FX1 unit to the lead vocals and a combined effects program – echo, hall, and chorus – via FX2 to the background vocals. To determine the desired intensity of each effect, you should start with the controls set at their center and make individual adjustments from there on. Please monitor the PEAK LEDs in the FX1/2 channels. The indicator should only light briefly at the occurrence of high program peaks. If the indicator is constantly lit, you should lower the send levels of those channels where the program peaks occur. For further information, please read the paragraphs about the FX1/2 units. (In case you are not using the internal FX units and/or you want to connect external signal processing units, the pre-mixed AUX/FX1/2 signals are outputted via the AUX1/2 send jacks.)

9. AUX 3/4

AUX 3 and AUX 4 controls are primarily meant for establishing two independent monitor mixes. Using the master section's AUX PRE/POST switches allows determining whether the signals are split pre or post fader.

PRE-FADER: The audio signal that is present at the AUX control is tapped pre volume fader and therefore not affected by the fader's setting. This mode is mainly used for monitoring. Pre-Fader Monitoring is especially preferable when monitoring and main mix need to be completely different from each other, e.g. when the volume setting of particular musical instruments or vocals needs to be higher or lower than in the main mix. In most cases the mixing console is placed somewhere in the audience area (FOH) and is being operated by an experienced sound technician.

POST-FADER: The audio signal that is present at the AUX control is tapped post volume fader and therefore affected by the fader's setting. This mode is mainly used for establishing FX- or special monitoring mixes. Using the POST-Fader method is recommended when the mixer is also located on the stage and you have to operate it yourself.



Setting all AUX3 or AUX 4 controls to their center position, the main mix is also present on the monitor bus, giving you the opportunity to control the volume settings of each channel individually from the stage. The overall volume of the monitor mix is set using the AUX3/AUX4 faders in the master section. If you are using this option you should keep in mind that all volume changes made with the channel faders also apply to the monitor mix, leaving you with a higher risk of acoustic feedback.

The Post-Fader Monitoring method provides the possibility of canceling channels of some instruments – like kick or snare drum, which are in fact already very loud on-stage – from the monitor mix by turning the corresponding controls all the way to the left.

10. PAN

This control determines the position of the connected sound source within the stereo image. When this control is set at its center position, the audio signal is fed with equal levels to the L and R master busses. The PAN control section is designed to maintain the essential sound pressure level, no matter at what position within the stereo image the PAN control is set to.

11. MUTE

The MUTE button mutes the input signal post fader, including all AUX sends. PFL and Signal/Peak stay functional.

12. PFL

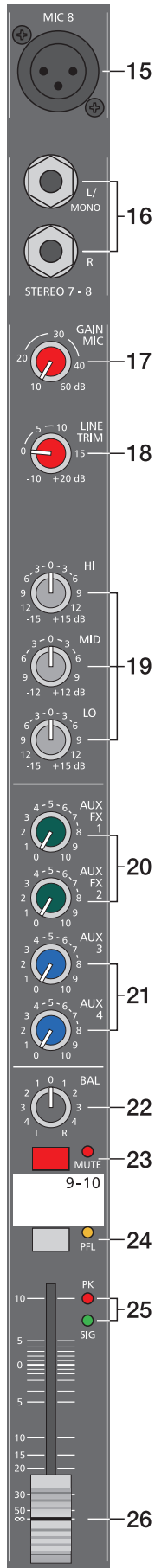
Engaging the PFL button routes the audio signal to the headphones bus, so that it is present at the phones output connector. The meter instrument in the master section is simultaneously switched, so that the left LED-chain indicates the level of the actually chosen channel (in dBu), which allows optimally matching the level of the signal source. The phones output volume does not depend on the setting of the corresponding channel fader (PRE FADER LISTEN), which provides the possibility to listen to or shape the sound of the selected audio signal, without need to include it in the main mix.

13. SIGNAL / PEAK Indicator

The signal-peak indicator plays a key role when setting input levels. Unlike the mixers of many other manufacturers that either only provide a peak indicator or no channel indicator at all, the PK (peak) LED of the PowerMate provides optical indication of the risk of occurring overdrive before you would actually hear the distortion over the connected speaker systems. As outlined in the setting instructions, the Signal-LED should blink in the rhythm of the incoming signal. If this is not the case, you have to increase the gain. If the PEAK LED, on the other hand, blinks frequently or lights continuously, the corresponding channel is likely to enter clipping and you have to turn the gain control a bit to the left. The Signal-LED lights at levels –30dB below clipping while the peak LED lights at a level of –6dB below the occurrence of overdrive. Keeping an eye on the indicator during a performance is also a good idea, because some very dynamically performing members of a band or changing keyboard setups can easily lead to channel clipping, resulting in the degradation of the overall sound.

14. VOLUME

The channel faders set the volume of the corresponding channels, establishing an accurately proportioned mix. The channel faders should be positioned within the range of –5dB to 0dB, leaving you with a degree of control that allows the precise matching of relative big differences in the channels' level settings. The overall volume is set through the use of the master faders. Even though the channel faders offer an additional amplification of +10dB, we would like to advise you to exceed the +5dB mark only in very few exceptional cases. If the PowerMate's summing bus gets "overloaded" with too many "high level" input channels, despite its special gain structure, the summing amplifier could be driven into clipping. Once you register, that some channel faders are set above the 0dB marking, lowering the setting of each channel fader by about –5dB and increasing the overall output level by elevating the master faders is the wiser solution. The proportion of the mix and the overall volume stay the same while the risk of clipping is banished.

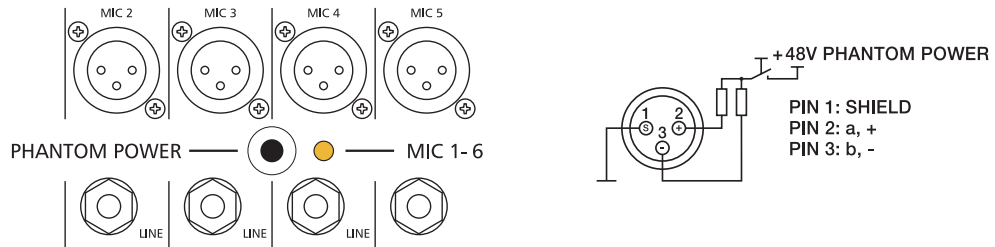


Since most features – AUX faders, controls and channel faders – of the STEREO INPUTS are virtually identical to the ones of the MONO INPUTS we will not discuss their functioning in detail again. Thus, in the following we only point out the differences and like to ask you to refer to the analogous paragraphs within this owner's manual describing the MONO INPUTS.

15. MIC

Different from the products of many other manufacturers, the stereo input channels of the PowerMate, like their monaural counterparts, incorporate extensive circuitry and electronically balanced XLR-type connectors for the connection of low impedance microphones. No matter if your setup is more microphone-oriented or you have more line level sound sources to connect, you can always use the full amount of input channels, provided by your PowerMate.

Dependable on its setting, the high-quality MIC input in the stereo channel is capable of handling levels between -60dBu ... +11dBu. Low-level circuitry architecture and phantom power (+48V) ability of this XLR-type input are mainly aimed at the connection of microphones, making it not necessarily suitable for connecting Line level appliances, like mixers, effects units, etc. Please use the provided LINE inputs to connect those sound sources. General functions and usage of MIC inputs were already discussed in detail for monaural channels.



16. STEREO INPUT L/MONO R

Electronically balanced inputs for the connection of musical instruments with stereo output, like keyboards, drum machines, E-guitars and E-basses with an active output as well as all other equivalent sound sources with high level outputs, like additional mixing consoles, FX units, CD players, etc. The stereo LINE input is meant for balanced or unbalanced sound sources with levels between -20dBu +41dBu. For the connection of external devices you can use monaural or stereo phone plugs, which are in accordance to the diagram below. If the external appliance is equipped with a balanced output stage, using balanced cables and plugs is preferable, since this type of connection provides improved shielding against HF induction and external noise.



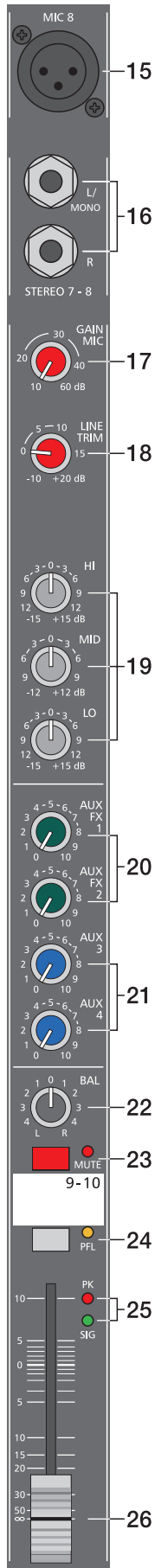
In case you want to connect a monaural sound source to a stereo input channel, you just have to plug it into the L/MONO input. The signal gets internally routed to both channels.

17. GAIN MIC

Rotary controls for adjusting the MIC inputs' sensitivity, providing the possibility to optimally match the incoming signals with the mixer's internal operation level. The GAIN MIC control in the stereo channel is only active for the XLR-type input.

For further information about setting and functioning of these controls, please refer to the chapter "GAIN" of the MONO INPUT description within this manual.

CAUTION: The GAIN MIC control of an inactive microphone input should always be set to its minimum position. Otherwise the noise of the inactive input is added to the audio signal of the corresponding LINE input, which could lead to unnecessary extra noise at the main output, becoming clearly intelligible in program breaks.



18. LINE TRIM

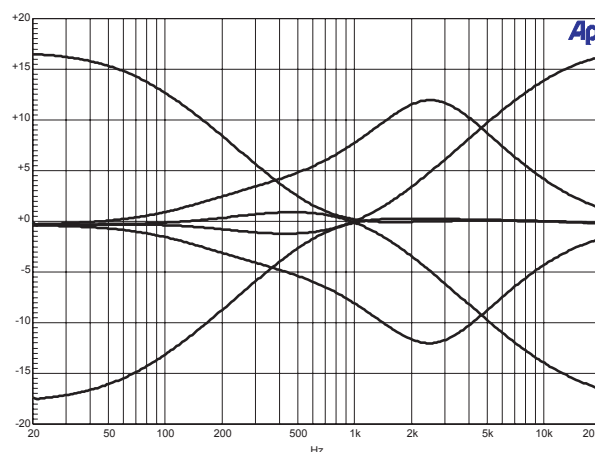
These rotary controls are for matching the incoming line level signals to the operating level of the PowerMate. The total adjustment range is 30dB. Unity gain – no amplification (0 dB) – is achieved at the 0dB mark. The control offers level reduction of –10dB and an amplification of +20dB. This range allows the connection of most professional, semi professional, and hi-fi sound sources. For further details on how to set the LINE TRIM control, please refer to the description of the GAIN control in monaural channels.

If you use a keyboard as sound source on one of the stereo inputs, make sure that no split zones or layers with channel separation are activated. The stereo channel mapping will otherwise appear like it is set on the keyboard – the lower layer in the left and the top layer in the right channel – and you will not have the opportunity to re-position the sound in the overall stereo image, unless you connect the keyboard output to two adjacent monaural input channels, leaving you the option to place the sound in the final mix via PAN controls.

One more tip, in case you desperately need another input and all channels of the PowerMate are already in use: The microphone input and the phone plug-type inputs are electrically totally separated from each other. Each input is equipped with its own gain control – respectively trim control, providing you with the possibility to connect a LINE level sound source in addition to a microphone. Of course, the two sources share all other controls. Consequently, separate adjustments are not possible. Hence to that fact, this option is only meant as a subsidiary function and should only be used when there is absolutely no other alternative.

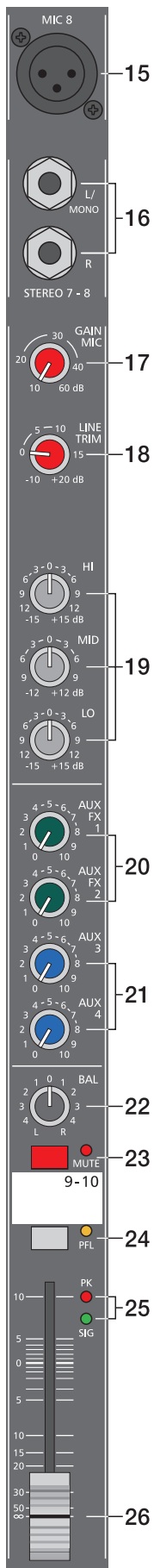
19. EQ SECTION

The mixer's EQ section allows very comprehensive and effective shaping of the incoming audio signal within miscellaneous frequency bands. Turning one of the EQ level controls to the right enhances/amplifies the corresponding frequency range while turning them to the left lowers/attenuates the signal of that specific frequency band. Before you begin to alter the sound, all EQ controls should be set to their neutral position, i.e. their marker points straight up (locked in place). Do not set the EQ controls to extreme positions. Usually, minor changes are totally sufficient and produce the best results in the overall sound. You should use the natural reproduction as an orientation mark and rely on your musically trained ear. The moderate use of the MID control is the best remedy to avoid acoustical feedback. Especially in this frequency range you should try to avoid excessive enhancement. Lowering the level more or less in this band will provide you with high amplification rates without feedback.



The EQ section of the STEREO channels is designed in a way that HI and LO controls provide a degree of control that is equally adequate for LINE level inputs and microphones. The MID control is active in a comparably wide frequency band around 2.4 kHz. With most microphones this is the critical range, where a slight attenuation offers excellent results.

INPUT STEREO



20. AUX /FX

These controls determine the amount of the summed L and R signal that is sent POST-FADE to the AUX/FX summing bus. For more details on the functioning of these controls, please refer to the INPUT/MONO section of this owner's manual.

21. AUX3/4

These controls determine the amount of the summed L and R signal that is sent to the AUX3 or AUX4 summing bus. Depending on the setting of the AUX PRE/POST switch in the PowerMate's master section you can choose if the signal gets split PRE or POST FADER. For more details on the functioning of these controls, please refer to the INPUT/MONO section of this owner's manual.

22. BAL

The function of the BAL control of the stereo channels is equivalent to the PAN control's function of the monaural channels. If you turn the rotary control all the way to the right, the right signal is outputted to the right output while the signal of the left channel is muted. When the control is set to its center position, the L/R signals are present with their equal intensity on the corresponding outputs. Whenever stereo sound sources are connected to a stereo input, you should leave the BAL control at the center position or make only minor adjustments in either direction. In case a microphone or another monaural sound source is connected, the BAL controls function absolutely identical to the PAN controls of the monaural input section.

23. MUTE

The MUTE button mutes the input signal post fader, including all AUX sends. PFL and Signal/Peak stay operational.

24. PFL

Engaging the PFL button sums the stereophonic audio signal of the corresponding input channel and routes the resulting monaural signal to the headphones bus. You are able to listen to the audio signal via the phones output. The meter instrument in the master section is simultaneously switched, so that the left LED-chain indicates the level of the actually chosen channel (in dBu), which allows optimally matching the level of the signal source.

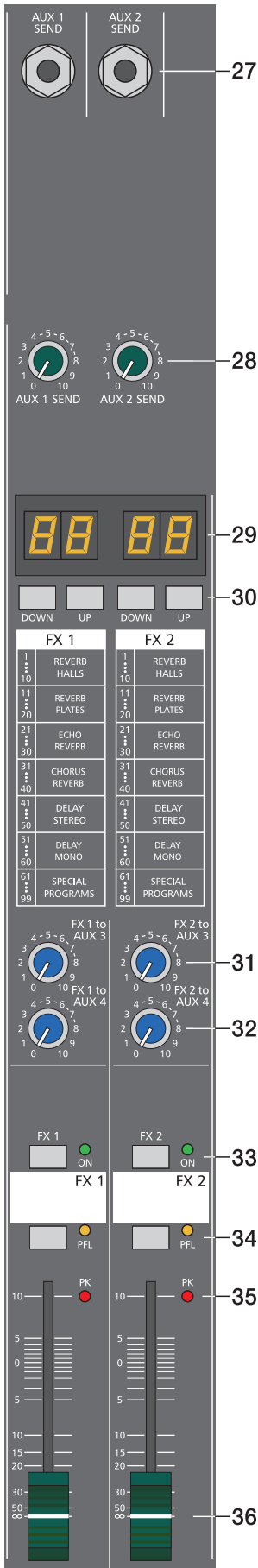
You can assign as many channels as you want to the phones summing bus at the same time. The volume levels of the individual signals are not affected by the setting of the corresponding channel faders (PRE FADER LISTEN). This gives you the opportunity to set the level and the EQ of a channel, without the need to include it in the main mix, i.e. you can leave the channel fader down or even engage the MUTE button.

25. SIGNAL/PEAK

The stereo SIGNAL/PEAK indicator function provides independent analysis of left and right channel audio signals. The respective highest level reading is indicated, assuring that neither one is already driven into clipping. For further information on how to use this indicator most efficiently, please refer to the description of the monaural channel's identical feature.

26. VOLUME

The channel fader is used to simultaneously adjust both levels (volumes) of the stereo signal. Functioning and specifications are totally similar to the monaural channel fader, as previously described under INPUT/MONO.



FX1/FX2

The PowerMate offers two independently controllable, identically configured 24-bit stereo effect units – FX1 and FX2. Each unit provides 99 program presets, which are selected by the use of the UP/DOWN buttons. The 99 presets are divided into groups according to their different effect structure, as shown on a printed listing. The programs within each preset group are sorted in ascending order, where higher numbers provide the same FX type with increased intensity. Presets 1 - 20 offer high quality reverberation effect programs that are equally suitable for live performance, recording studio or home recording applications. Program numbers 21 - 40 provide mixed effect types of echo/reverb and chorus/reverb while the numbers 41 - 60 offer different delay effects. The last group from 61 - 99 provides different flanger, chorus, and doubling effects presets as well as special delay and reverb programs. During the initialization of the FX units (when switching on the power of the PowerMate), preset 05 (Large Hall 3 Bright) is selected for the FX1 while the FX2 unit is set to preset 55 (Delay Mono 250ms). These two effects are similarly suitable for live performances and recording applications. This is the factory-preset configuration that can be changed any time. For further information, please refer to the paragraph **Changing FX Start Programs**.

The two effect programs are equally suitable for live performance or recording applications and can be used separately or together. For testing, evaluating and selecting effect programs, please also refer to the supplementary information form EFFECT PRESETS, which provides detailed description of all effect presets. This listing contains all preset names together with the corresponding effect structure, field of application, and frequency characteristics. Take your time to test all presets and select the ones that are best suited for your specific application. Program number “0” selects a Slap Back Echo, which is mainly for servicing and testing only, and therefore is not included in the effects listing on the front panel. Also provided is a FOOTSWITCH connector, which allows the connection of a footswitch pedal to remotely control the FX units’ EFFECT ON/OFF function. If your footswitch features a LED – like the optionally available DYNACORD FS 11 does – this indicator will light when the effect is activated (EFFECT ON).

Changing FX Start Programs

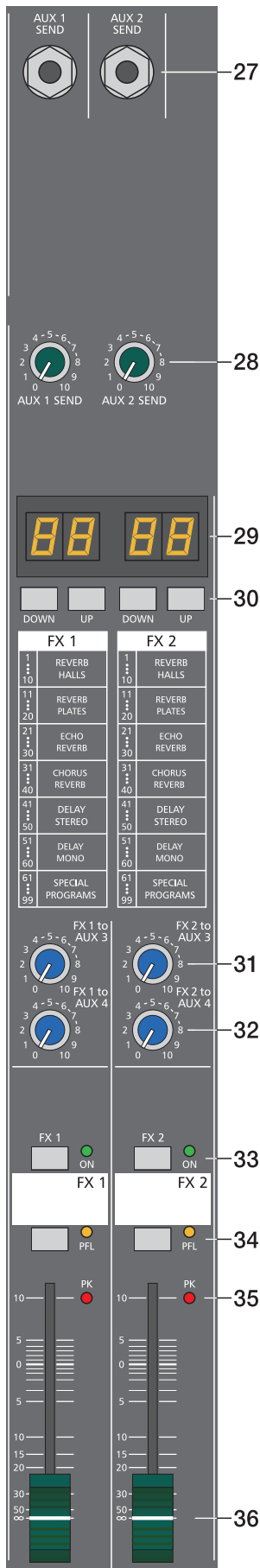
In the factory shipping state, the FX units start with the programs 5/55. If you prefer different programs, you can change and store the new settings in the programming mode. To assign new start programs, please proceed as follows:

1. Hold down the two DOWN buttons of FX1 and FX2 simultaneously while switching on the PowerMate.
2. “Prog” appears briefly on the display. Programming mode is now active. A software-related side effect is that all buttons behave a bit slower than usual.
3. Release the two DOWN buttons and select the desired start programs.
4. Press the two UP buttons to store the displayed effect numbers as your new start programs. The FX unit acknowledges the save procedure by briefly indicating “Prog” on the display.

FX1/FX2						
1.....10	11.....20	21.....30	31.....40	41.....50	51.....60	61.....99
REVERB HALLS	REVERB PLATES	ECHO REVERB	CHORUS REVERB	DELAY STEREO	DELAY MONO	SPECIAL PROGRAMS

27/28. AUX1/2 SEND

The audio signal of the mix that you have established for the corresponding AUX/FX bus – the identical mix that is fed to the internal FX1/2 units – is present at this socket, which makes it perfect for connecting external FX units, for example. Setting the level is possible by means of the corresponding AUX/FX SEND control. The external devices’ output signals can be sent back to the PowerMate via stereo channel input. The AUX1/2 sends are designed in Ground Sensing technology to prevent the induction of external noise, even with long cables.



29. DISPLAY

The display always indicates the actually selected program number of the corresponding FX unit. The display screen is covered with a protective foil to prevent it from being damaged during shipment. Please remove the foil.

30. UP/DOWN

The UP/DOWN buttons are for selecting effect presets. Keeping a button pressed continuously lets you step quickly through the program numbers.

31/32. FX1/2 to AUX3/4

These controls allow adding the output signal of FX1 or FX2 to the monitoring channel. Experience has revealed that the effect level in the monitor mix has to be lower than the level in the main mix, since the distance between monitor speakers and artists is much shorter.

33. FX ON

This switch switches an internal FX unit on and the green LED lights. Please keep in mind that you can also use an external footswitch for the switching of the FX unit. In this case, the LED also shows the actual operational status of the FX unit. If you want to use a footswitch, the FX ON switch has to be engaged first. The corresponding FX unit is activated and you can use the footswitch to switch the selected effect program on or off.

34. PFL

Engaging the PFL button routes the audio signal to the headphones bus, so that it is present at the phones output connector. The phones output volume is independent of the corresponding channel fader's setting (PRE FADER LISTEN), which provides the possibility to listen to the sound of the selected audio signal, without including it in the main mix.

35. PEAK LED

These indicators signal if the internal FX units or the AUX 1/2 SEND signals are on the verge of clipping. To achieve an adequate S/N ratio, please adjust the FX units' input level as follows:

Setting Instructions:

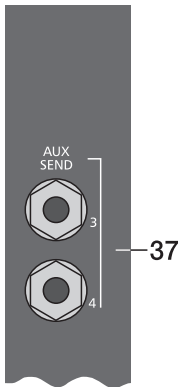
1. Establish a "dry" mix – without effect settings – according to the previous descriptions.
2. Position the effect return fader of the corresponding effect channel at the -5dB mark.
3. Use the UP/DOWN buttons to select the desired FX program preset.
4. Press the FX ON switch.
5. Play (start the reproduction of) the sound source connected to the desired input channel and adjust the desired amount of the FX signal, using the AUX/FX controls of this input channel. Repeat this step for all input channels that you want to include in your effect mix.
6. Monitor the Peak LED so that it only lights frequently at highly dynamic signal peaks. When clipping occurs, reduce the AUX/FX controls in the channels.
7. Use the FX to AUX control to add the effect mix to the monitor mix. Use the FX return faders to add the desired amount of the FX signal to the main mix.

In case you are using a different effect setting for the second FX unit, you have to repeat steps 2 - 8, respectively. Pay some attention to the peak indicators when operating your PowerMate to be able to quickly interact when the signal levels exceed the normal range and enter clipping.

36. EFFEKT RETURN

These stereo faders are used to determine the effect amount added to the main mix. In case you have to set these faders at a position above the $+5\text{dB}$ mark, please check if the FX unit's input signals are adjusted properly. Otherwise use the AUX/FX SEND controls to increase the input levels.

Generally, the AUX3/4 channel is used for monitoring purposes. Depending on the setting of the AUX3/4 POST button, it is also possible to configure the bus for the connection of an additional, external FX unit.



37. AUX3/4 SEND

This output provides connection for an external FX unit or, when used for monitoring, a power amplifier or active stage monitor speaker systems. Using the AUX3/4 fader allows setting the output level in a wide range up to +20dBu. The AUX3/4 SEND is designed in Ground Sensing technology to prevent the induction of external noise, even with long cables. Use balanced cables for the connection of external components whenever it is possible.

38. AUX3/4 POST

As already previously described, this switch allows determining whether Pre- or Post-Fader signals are present at the AUX3/4 channel. The corresponding yellow LED signals when the switch is engaged and all input channel AUX3/4 controls are assigned post fader.

39. FEEDBACK FILTER

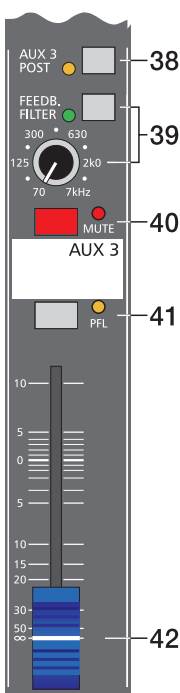
The feedback filter is a very narrow banded notch filter, which is only active in a range that is extremely susceptible for acoustical feedback. The FEEDBACK filter rotary control sets the corresponding frequency range. Pressing the corresponding button activates the filter. Several circumstances and conditions have an influence on how sensitive or insensitive your system is for acoustical feedback. The following notes are meant to assist you in avoiding feedback and you should take them into consideration even before you activate the feedback filter:

1. Do not position the main speaker systems behind the microphones.
2. Switch off all microphones that are not in use.
3. Consider the microphones' different polar patterns and characteristics, when placing the monitor speakers.
4. Do not turn up the monitor system's volume higher than actually necessary.
5. Try to avoid extensive equalization on channels that you want to include in your monitor mix.
6. Keep in mind, that a microphone "behaves" different when somebody stands right in front of it.
7. Position the microphones as direct as possible to the sound source.

If you still have the feeling that the monitor system's acoustic output is not sufficient, after considering the above mentioned precautions, you can use the FEEDBACK filter to mute the frequency that tends to generate feedback the most. Therefore, you have to perform the following steps: Increase the AUX3/4 (monitor) level until the limit is reached where feedback starts. The slightly "hovering" sound that you hear is generated by the system itself. Switch on the feedback filter, turn the rotary control and set it at the mark where the "sound" disappears. Switching the filter on and off lets you easily check whether you tuned in the correct frequency. The feedback filter attenuates the level of the corresponding frequency band by about 9dB. Since the filtered band is extremely narrow, an alteration in the sound of your monitor system is hardly audible.

Caution: Please be extremely careful in driving the system just below the feedback limit.

Careless operation, resulting in feedback noise at high SPL, can cause severe damage to your speaker systems and – even more important – the human ear.



40. MUTE

The MUTE button mutes the Aux-Send output signal. PFL signals are not affected.

41. PFL

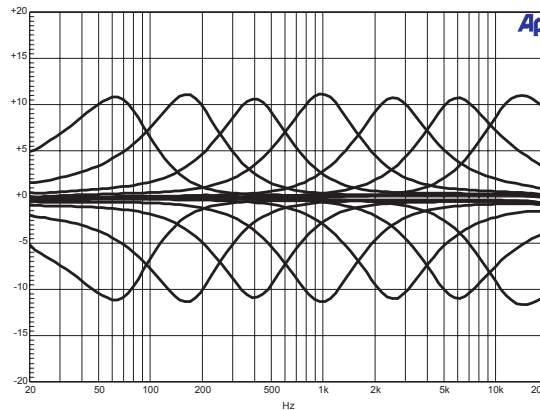
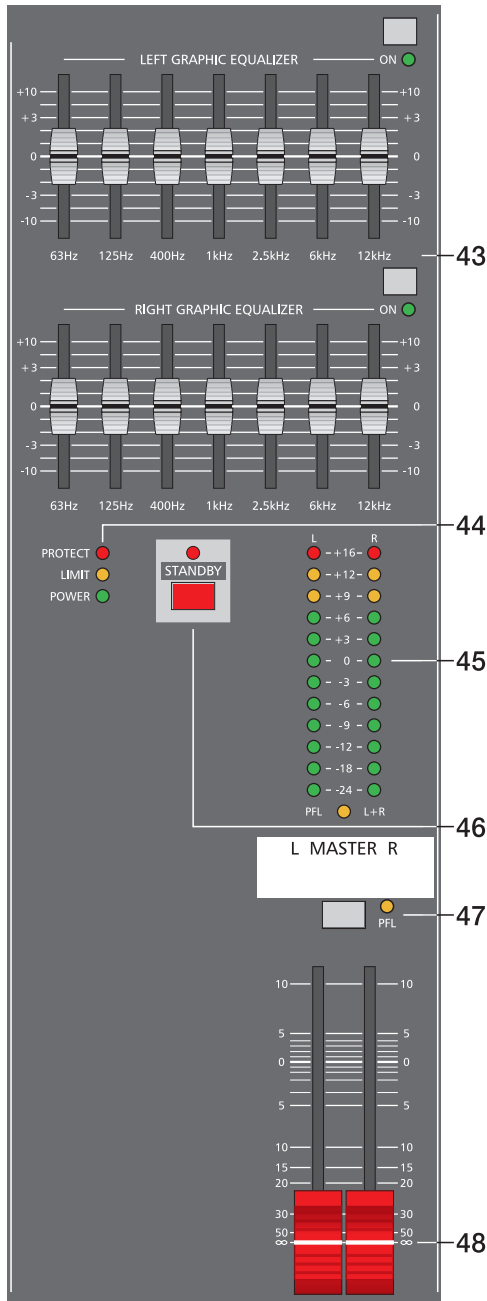
Through this button you can route the pre AUX3/4 fader signal to the headphones bus. The signal is outputted for listening via the headphones output. The setting of the AUX3/4 fader is not relevant for the signal's volume (PRE FADER LISTEN). The meter instrument in the master section is simultaneously switched, so that the left LED-chain indicates the level of the actually chosen channel (in dBu), leaving you with the opportunity for adjusting the level without routing it to the AUX3/4 SEND bus.

42. AUX3/4 VOLUME

This fader controls the summed audio signal at the AUX3/4 SEND output. When used for monitoring, this fader lets you control the volume of the monitor system.

43. 7-BAND EQUALIZER

Left and right master channels employ a 7-band equalizer, which gets activated through the use of the EQ ON button. The EQ's insert point is post master fader and pre power amplifier. The EQ is bypassed when the EQ ON switch is not locked in its "ON" position. Seven frequency bands offering 10 dB amplification/attenuation and a quality of Q=2 allow shaping the overall sound to meet your personal preferences or to optimally match it to the acoustic conditions of different locations.



The frequency ranges as well as the characteristics of the EQ faders are very praxis-oriented. In case you want to have a clear and highly intelligible sound, which, as a side effect, provides the cymbals with more crisp, you should raise the levels of the 12kHz or 6kHz band a bit. If the MIDs are nasaling you should attenuate the mid range by some decibels. To provide the kick drum with more punch you have to boost the low frequency range, using the 63Hz or the 125Hz controls. In case the overall sound is undefined with too much bass, lowering the levels of these two frequency bands will solve the problem. However, especially with equalization you should be aware of the fact that in most cases less adjustments provide better results. Thus, your first choice should be to establish the mix using only the input channel controls and see if you get a satisfactory result. If so, you can use the graphic EQ for the AUX3/4 or the MONO bus, where in most cases, especially when used for the monitoring, it is more needed. You will find the description of how to include the graphic EQ in these buses in the following explanation of the MASTER PATCHBAY.

44. STATUS INDICATORS

These indicators are to inform you about the actual operational state of the PowerMate's internal power amplifier.

The **POWER ON** indicator is always lit when the PowerMate is operational. If the LED does not light after switching the power on, please make sure that the PowerMate's mains cable is correctly plugged in. If this is the case and the LED is still dimmed, please contact your dealer.

The **LIMIT** indicator signals that you are operating the PowerMate at the internal power amp's limit. Frequent blinking of the LED is acceptable, since the amplifier's incorporated limiter prevents distortion. Continuous lighting indicates that you have to be aware of degradation in the outputted sound. In that case, the master level has to be reduced.

The **PROTECT** indicator lights when one of the PowerMate's extensive protection circuits – against thermal overload, HF-induction, DC at the outputs, and SOAR-protection – is activated. When the PowerMate is in protect mode, the speaker outputs are muted and the amplifier inputs are short circuited to prevent the power amp from being damaged. In this case you should first check whether the ventilation louvers are blocked. Another cause could be, that you have connected more than three 8ohms speaker systems per power output. Please also disconnect the SPEAKON connectors and check the speaker cables for short circuits.

During power-on operation the PROTECT LED always lights for about two seconds and the internal fans run at full speed, signaling that the PowerMate's protection circuitry is operational.

45. MASTER LED-DISPLAY

The PowerMate offers two 12-segment LED-chains for optical monitoring the output levels of the L/R master signals. The indication range of the LED-meter is 40dB, indicating the levels that are present at the main outputs in dBu. The meter's 0dB mark is referenced to a 0dBu output signal at the mixer output. Further increasing the level leads to the power amplifier's maximum input level of +6dB – equaling an output power of 700 watts into 4 ohms per channel. Although higher levels are being displayed, the power amp's processor already limits the signal, which is indicated by the lit LIMIT LED in the status display.

46. STANDBY

Pressing the STANDBY button mutes the output signals at the main outputs, EQ outputs and MONO output.

Caution: The monitor outputs AUX3/4 are still operational.

Because the signal flow between MAIN INSERTS and MAIN OUTPUTS is interrupted, the signal feed to the internal power amplifier is also interrupted. The STANDBY LED lights indicating that stand-by mode is engaged and that input channel signals are not output via the speaker systems. However, audio signals connected via 2Track Return are still outputted, providing you with a very comfortable solution to play intermission music during performance breaks.

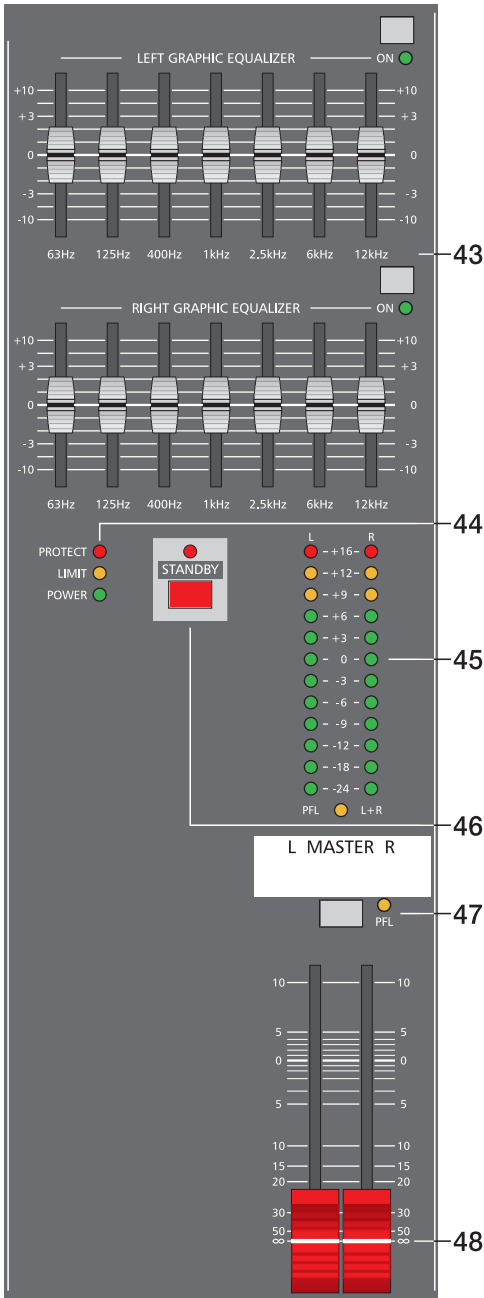
47. PFL MASTER

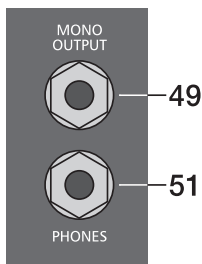
Engaging the master PFL-button, the PRE FADER mono master signal is routed to the headphones bus, so that it can be monitored via headphones output. The volume of this signal is not affected by the setting of the MASTER fader. The meter instrument in the master section is simultaneously switched, so that the left LED-chain indicates the level of the summed pre-fader L/R master signal channel (in dBu), which basically is the master bus level, while the right LED indicates the level of the summed post-fader master output.

48. MASTER L + R

Level controls to adjust the output signals of the left and right main outputs (MASTER).

Please, make sure to set the input channel faders or at least the master faders to their minimum position, or to engage the STANDBY switch, before connecting an external sound source to an input of the PowerMate. This will save you, your audience, and the equipment from unnecessary stress.





49. MONO OUTPUT

At the monaural output the summed L/R master audio signal is present that can be used for additional monitoring, side fill and “next door” applications, or for the connection of a delay-line or subwoofer.

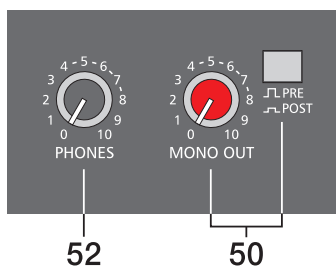
50. MONO OUT

With subwoofer operation, “next-door”, monitoring or delay line applications a pre/post-switch able mono output often comes in handy.

PRE-FADER: The mono out’s signal is summed and outputted pre master faders, i.e. the level at the mono out is independent from the master faders’ settings.

POST-FADER: The mono out’s signal is summed and outputted post master faders, i.e. the level at the mono out depends on the setting of the master faders.

Of course, controlling the SUB’s level via master fader makes sense when using an active monaural subwoofer. For monitoring applications, e.g. side fill on the stage, using the pre-fader setting seems more reasonable.



51. PHONES

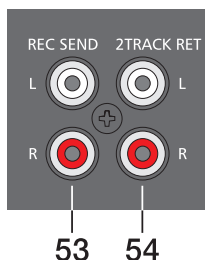
Stereo phone jack for the connection of headphones with an impedance of 32 – 600 ohms. The audio signals of the channels with PFL buttons engaged is outputted via this connector.

The phones output presents the master L/R signal when there is no PFL button engaged.

52. PHONES

This control sets the volume of the headphones connected.

CAUTION: Make sure to set the control to its minimum position before connecting headphones

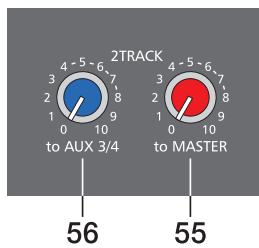


53. RECORD SEND L/R

These RCA-type connectors carry the PRE FADER master L/R signal. The signal is not affected by the setting of the master faders and therefore mostly used for the connection of cassette decks, open reel tape decks or DAT recorders for recording purposes. The nominal level of –10dBV of the outputs matches the professional industry standard as well as most home recording applications. Nevertheless, you should use the input gain control of your recording device - as far as it is provided. **CAUTION:** On most tape decks the input signal is directly carried through to the outputs. In case you have connected both, the REC. SENDS and the 2TRACK RETURNS, and the PowerMate’s 2TRACK to MASTER control is set to anything but its lowest setting, the recorded signal is included in the main mix again. The difference in delay of the two signals is responsible for dropouts and general degradation of the sound. In the worst case, activating the RECORD button on your tape deck could lead to very unpleasant feedback noise. To prevent this from happening make sure to set the 2TRACK to MASTER and the AUX3/4 controls to their lowest settings.

54. 2TRACK RETURN L/R

Here you can connect a tape deck, a CD player, an open reel or an additional SUB-mixer. The signal is post master fader and post STANDBY switch, which allows playing intermission music during performance breaks or checking the mix during the rehearsal, using the headphones. You just have to engage the STANDBY switch to mute all channel signals at the main outputs. The 2TRACK RETURN signal however will pass unobstructed.



56

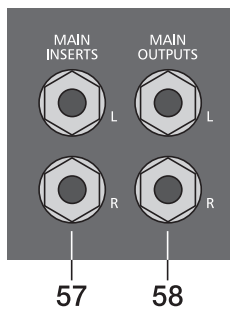
55

55. 2TRACK to MASTER

This control is used to mix the 2TRACK signal to the main mix; post fader of the master controls. Caution: When adjusting the level of the device that is connected to the 2TRACK RETURNS – CD player, tape deck, etc. – always begin with the 2TRACK to MASTER control set at its minimum setting. Otherwise, depending on the output quality of the connected sound source, the outputted level can instantly “hit the top”.

56. 2TRACK to AUX 3/4

The signal coming from the 2TRACK RETURNS is internally summed and can be added to the monitor bus using the 2TRACK to AUX3/4 control.



57

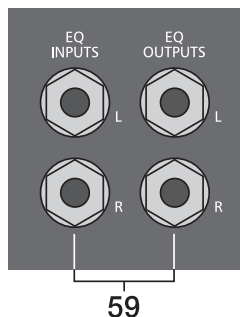
58

57. MAIN INSERTS

Stereo phone jacks for left and right channels with breaker function. The low impedance output is assigned to the tip (send) and the high impedance input (return) is assigned to the ring of the connector. This jack allows incorporating external third octave band or octave band EQs, compressors, limiters, de-noisers, etc. into the master's signal path. The insertion point is pre master faders. As well as with the inserts of the monaural input channels, different DIRECT OUT functions can be accomplished. Please, also refer to the corresponding section in the description of the MONO INPUTS.

58. MAIN OUTPUTS

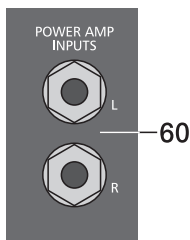
The signals at the MAIN OUTPUTS are post master fader and mainly meant to feed additional, external power amplifiers. Through these outputs it is also possible to establish two-way active system set-ups. In this case the active crossovers – respectively the active subwoofers – have to be connected to the MAIN OUTPUTS. If you want to use the internal power amplifier to drive the high frequency cabinets, the treble signal coming from the crossover has to be fed back into the PowerMate via the Power Amp In connectors.



59

59. EQ INPUTS / OUTPUTS

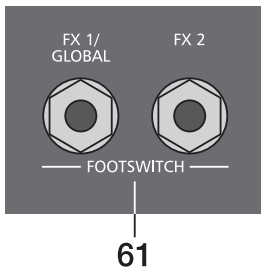
The EQ INPUTS are provided through electronically balanced phone jacks with breaker function. Inserting a phone plug interrupts the signal path between master and internal power amplifier. You can then operate the internal power amps via EQ INPUTS. The signals at the EQ OUTPUTS are post master fader and post internal 7-band equalizer and can be used like the MAIN OUTPUTS for connecting external power amps.



60

60. POWER AMP INPUTS

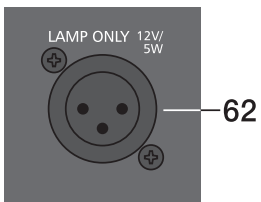
The POWER AMP INPUTS are also provided via electronically balanced phone jacks with breaker function. When inserting a phone plug, the signal path gets split up between the master and the internal power amplifier, which allows operating the internal power amps via POWER AMP INPUTS. For detailed information on the functioning and the operation of the “MASTER PATCHBAY”, consisting of MAIN INSERTS, MAIN OUTPUTS, EQ IN- and OUTPUTS, and POWER AMP INPUTS, please refer to the corresponding section; later in this owner's manual.



61. FOOTSWITCH

Phone jack for the connection of an optionally available DYNACORD FS11 (110 693) footswitch to switch the effect mode of the internal FX units on or off. To accomplish this function, the FX1 and FX2 ON switches have to be engaged. To remotely control the effects units using only a single footswitch, the FS11 has to be connected to the FX1/GLOBAL connector. Both FX units are simultaneously switched. This function is useful for example when switching from vocal performance to announcer.

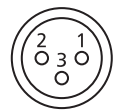
When remotely controlling the FX units using two footswitches, one FS11 needs to be connected to the FX1/GLOBAL and the other to the FX2 connector. Now, the two effects units can be switched independently, which is mostly used to switch between different effects settings during a performance.



62. LAMP XLR

This XLR-type socket provides a DC voltage of 12V/5 watts and is meant for the connection of a gooseneck lamp (litlite). Please make sure that the used lamp complies with the here mentioned specifications and pin assignment. Overload or short circuit can result in damaging this output. To prevent this from happening, we recommend the use of the gooseneck lamp (112700), available from the DYNACORD accessory assortment. For further information, please consult your local dealer.

LAMP
12V/5W
PIN 1: N. C.
PIN 2: +12 VDC
PIN 3: 0 VDC



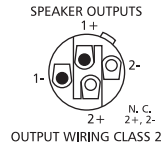
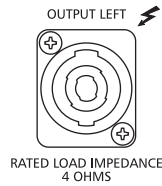
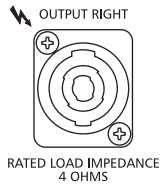
STEREO POWER AMPLIFIER

The PROCESSED COMPACT PRECISION stereo power amplifier of the PowerMate has been designed in discreet bipolar technology to provide a nominal output power of 700 watts into 4 ohms per channel. The minimal load impedance of 2.7 ohms allows the operation with a maximum of three 8 ohms loudspeaker systems connected in parallel to each output channel. Their low distortion rate and inter-modulation provide the amplifiers of the PowerMate with outstanding transmission capabilities that do not have to fear the comparison with professional high-end, stand-alone audio power amplifiers. The transmission qualities of CL power amps are simply extraordinary. Optimised power supply units employing low-leakage toroidal transformers and the consistent use of Class-H technology provide extensive headroom far above the stated nominal output. At the same time this contributes to a reduction in weight and leakage power.

Characteristic for the Class-H power amplifier design of the PowerMate is its extremely fast, signal-dependent operating voltage switching, which results in doubling the regular supply voltage when needed. In comparison to Class-AB power amps, Class-H power amps generate by far less leakage power at identical output. Consequently, reduced leakage power or dissipation is synonymous to less waste heat – energy is used more efficiently and the power consumption stays clearly below that of conventional Class-AB operation. As a result, installing Class-H power amps within rack shelf systems is possible with less space between appliances.

The power amplifier of the PowerMate is designed to live through the hardwearing use in the touring business. It incorporates protection circuitry against thermal and capacitive overload and short circuit as well as against HF-interference and DC at the outputs. Further protection of the power output stage against back-feed of electrical energy (BACK-EMF) is provided through special circuitry. When the PowerMate is switched on, a relay controls the delayed switching of the power outputs. The internal fans run shortly at full speed, acoustically signaling that the PowerMate is operational. Limiter circuitry (soft start) controls the initial current inrush, preventing the mains fuse from being blown during power-on. Two 3-speed fans (off/slow/fast) guarantee absolute thermal stability at low running noise. The ventilation is directed front-to-rear allowing trouble-free operation even in very compact amp-racks.

The extensive comparator circuitry constantly monitors the input and output signals of the PowerMate's power amp and activates the internal limiters whenever a non-linear operational state is encountered. This provides reliable protection of the connected loudspeaker systems against overload and clipping. Distortion is not intelligible even when the maximum input level is overridden. The amplifier of the PowerMate additionally incorporates LPN-filters (DYNACORD patent). Together with the 12dB Hi-Pass filters, these Low Pass Notch filters eliminate faults in the transient response of typical sound reinforcement speaker systems and provide your setup with an extraordinarily precise and powerful reproduction of low frequencies.



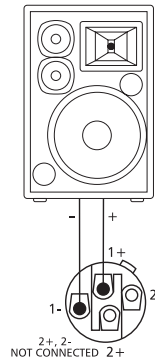
SPEAKER OUTPUTS RIGHT / LEFT

The PowerMate is equipped with professional SPEAKON high-performance connectors, offering electrical and mechanical secure connection, which complies to all security regulations. It also allows the use of high quality speaker cables with diameters of $4 \times 2.5\text{mm}^2$.

The DYNACORD accessory assortment includes all recommended cables and connectors.

Warning: The symbol “⚡” representing the speaker connectors indicates the presence of touch-sensible voltages, which can cause harm to body and health.

Please, be sure to adhere to corresponding notes and instructions in this owner's manual when establishing speaker connections.



POWER

Mains switch to turn the PowerMate on or off.

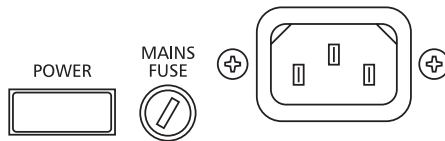
The PowerMate is operational when the POWER ON – LED lights and the power outputs are activated through automatic switching of the power relays.

Please make sure to set the master faders to their minimum position or engage the STANDBY switch before switching the power on. This will save you, your audience, and the equipment from unnecessary stress.

In case additional external equipment is connected to the PowerMate – e.g. power amps, FX units, EQs, etc. – please, proceed in the following order when switching your equipment on:

1. switch on the FX units
2. switch on the PowerMate
3. switch on external power amps

When switching the power off, please proceed in the opposite order.



SETTING UP A STANDARD PA-SYSTEM

Cabling

The mains supply cord comes with the PowerMate. The quality of all other cables lies in your responsibility. Carefully chosen high quality cables are the best precaution to prevent later problems during live operation. The following wiring alternatives are recommended to provide trouble free operation of your system.

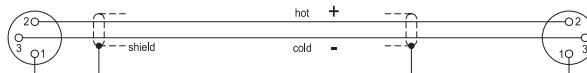
Speaker Cables

From our experience as a manufacturer of loudspeaker systems we know that flexible cables with a rubber jacket and a diameter of 2.5mm² per conductor, used in combination with SPEAKON plugs and sockets, are the best choice to guarantee the optimal connection of loudspeaker systems. Connect the SPEAKON plugs according to the corresponding diagram on the PowerMate's rear panel. We recommend using 4-wire cables where also the pins 2+ and 2- are connected through. This provides the possibility to use these cables in an active 2-way system configuration, as well. DYNACORD's accessory assortment comprises different speaker cables with SPEAKON connectors and all other cables, plugs, and sockets, available at your local professional audio dealer.

LF-Cables – Balanced or Unbalanced?

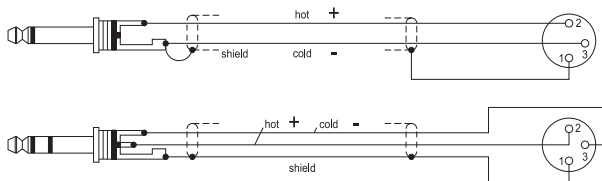
For LF-cabling – all the low current wiring – your best choice are balanced cables (2 signal conductors + ground shielding) with XLR-type connectors or stereo phone plugs. The cables should be step-on proof, shielded, and never longer than really needed. Too many too long cables mostly lead to confusion and generate unnecessary problems. Of course, connecting unbalanced cables with monaural phone plugs to the PowerMate's in- and outputs is also possible and in most cases no interference will occur because of its superb grounding managing system. Generally spoken, if you have the choice, a balanced LF-cable is always the better solution. Today's modern audio equipment – like amplifiers, equalizers, FX units, mixing consoles, and even some keyboards – offers balanced in- and outputs. In a balanced signal path the cable screen provides gapless connection of all metal parts, offering efficient shielding against the induction of external noise. The balanced cabling in conjunction with the common-mode rejection of the PowerMate's input stage effectively eliminates even existing artifacts of interference. All inputs of the PowerMate provide balanced audio connections and high common-mode rejection. The mixing stage outputs – AUX, MAIN, EQ, etc. – are laid out in GND-SENSING technology – a special pin assignment of the output jacks, offering all advantages of the balanced signal transmission, but lets you also connect monaural phone plugs without a problem. Nevertheless – as mentioned above – when longer cables are involved, using stereo phone plugs and balanced cables are the better alternative. The diagrams below show the pin assignments of plugs and cables that are used with the PowerMate.

MIC INPUT



balanced connection of microphones

All phone jack in/outputs of the PowerMate



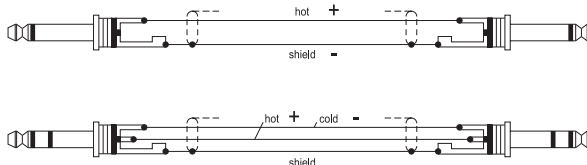
unbalanced external equipment with XLR-type in/output jacks
balanced

Channel Insert Main Insert



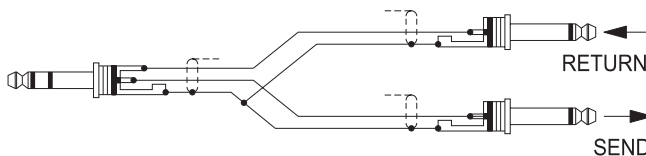
Direct OUT via INSERT, uninterrupted signal path

All phone jack in/outputs of the PowerMate



unbalanced external equipment with phone jack in/output jacks
balanced

Channel Insert Main Insert

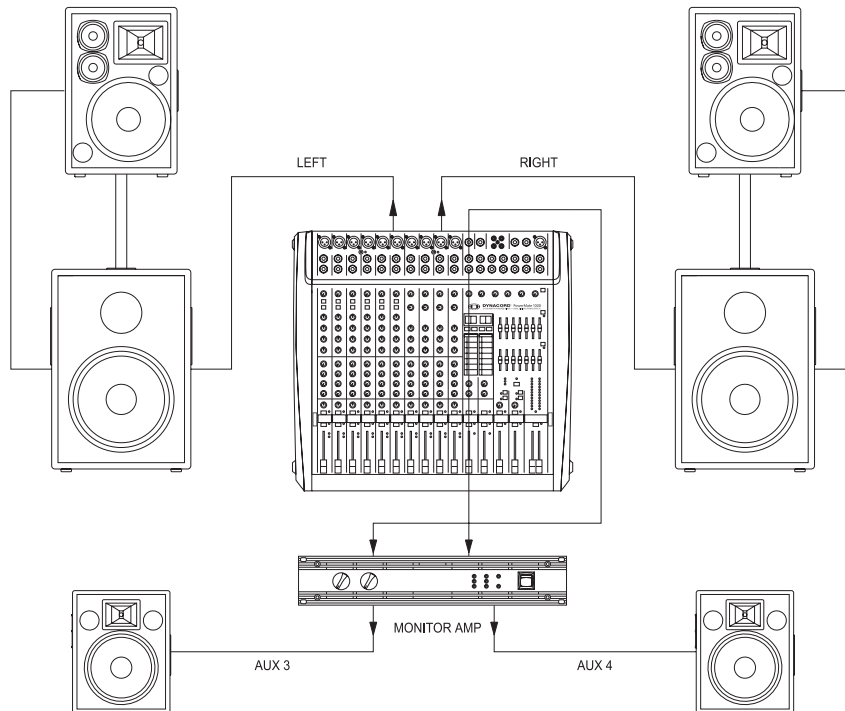


Y-type cable for the connection of external FX units and signal processors with phone jacks

SETTING UP A STANDARD PA-SYSTEM

In the following we would like to explain how to install a typical sound reinforcement system in passive configuration. The necessary equipment is:

- 1 PowerMate 1000
- 1 Power amplifier, e.g. 2x250 watts
- 2 HI cabinets, e.g. 3-way 12" speakers
- 2 LO cabinets, e.g. 15" woofer
- 2 Speaker pole-stands or 2 connection rods
- 2 Stage monitor speakers
- 4 SPEAKON cables 8m, 2 SPEAKON cables 2m
- 1 LF-cable with a stereo phone plug on one side and an XLR-type connector on the other end



Setting Up

- Place the PowerMate and the external power amplifier in a way that allows their unobstructed operation and connect the mains cord.
- Try to locate the best position where you want to place the loudspeaker systems. If possible, the woofers should be placed on the floor while the Hi cabinets' most favorable position is above the Lo cabinets, on the same vertical axis. It is important that the lower edge of the Hi cabinets is approximately at the same height level or slightly higher as the heads of the audience. Either you use the interconnection rods to mount the Hi cabinets on top of the woofer cabinets or, in case this kind of installation is not possible or you are not using woofer systems, use the separate speaker pole-stands instead.
- Do not place the left and the right speakers further apart than necessary. The less distance there is between the two speaker "clusters" – the more compact the sound.
- Try to avoid the positioning of the main loudspeakers behind the imaginary line of microphones. Otherwise, if you have to drive the system at higher sound levels, the risk of feedback is very likely.
- After you have installed all microphone stands and all artists found their place, the best spot to install the monitor speakers is up front facing the musicians and vocalists. Nevertheless, please check if a microphone is directly pointing in the direction of a monitor. In this case, change its position. You should also be aware of the individual characteristics of the employed microphones.
- Establish connections according to the diagram. Use the different SPEAKON cables to connect the speaker systems to the PowerMate's power outputs, respectively to the power outputs of an external amplifier. Make sure not to confuse the channels by accident. Using the short SPEAKON cables to connect Hi and Lo cabinets in parallel. The two monitor speakers are connected to the outputs of the monitor power amp.

SETTING UP A STANDARD PA-SYSTEM

- Connect the PowerMate's AUX3/4 SEND with the monitor amplifier's input, using an LF-cable with the stereo phone plug on one end and the XLR-type connector on the other.
- Connect all microphones preferably to the monaural inputs of the PowerMate and keyboards and other comparable sound sources to the rest of the available inputs.
- Pull all faders down and engage the PowerMate's STANDBY button to prevent unwanted feedback noise.
- First, switch the PowerMate on and then the external amplifier.
- In case you have condenser microphones connected to the PowerMate, you can now turn on the phantom power by pressing the PHANTOM switch.
- Activate the PowerMate's operational mode through pressing the STANDBY button again.

Sound Check

- First, adjust the input levels of the microphones that are connected to the PowerMate. Please proceed as follows:
 1. Set the corresponding gain controls and the channel faders to their lowest position.
 2. Speak or sing as loud as possible into the microphone.
 3. Use the gain control to adjust the level, so that even at loud passages the red PEAK LED does not light but the green SIGNAL LED lights constantly.
- Adjust the EQ of the monaural input channels:
 1. Slide the channel fader and the master faders up a bit, so that the sound coming from the main speakers is heard.
 2. Turn the MID control carefully all the way to the right (+15dB). You should not hear any feedback.
 3. Play the sound source or speak into the connected microphone
 4. Turn the frequency control (kHz) slowly from left to right.
 5. Surely and within no time, you will detect the frequency range that is not to your liking or causing feedback noise.
 6. Leave the frequency control in this position and turn the MID control to the left until the sound is natural or to your liking.
 7. If necessary, adjust the Hi and LOW controls, starting from their centered position, until the sound matches your personal taste.
 8. Repeat steps 1 - 7 for all monaural input channels in use.
- In case you are also using the stereo input channels, you can adjust the levels in a similar way:
 1. Set the LINE TRIM controls, the MIC gain controls, and the channel fader to their lowest setting.
 2. Play the corresponding sound source at the highest volume that is to be expected during the performance.
 3. Use the LINE TRIM control to adjust the level, so that even at loud passages the red PEAK LED is not lit but the green SIGNAL present LED lights constantly.
- Adjust the EQ of the stereophonic input channels:
 1. Slide the channel fader and the master faders a bit up, so that you can hear the sound through the main speakers.
 2. Set the EQ controls to their center position.
 3. Play the corresponding sound source.
 4. Starting from the center position, you can adjust the controls until the sound is to your liking. Please, keep in mind that major alteration of the EQ-setting does not necessarily result in the improvement of the overall sound. Especially when sound shaping is concerned, less can be more.
 5. Repeat steps 1 - 4 for all stereo input channels in use.
- If musical instruments are connected directly to the monaural inputs, follow the descriptions above describing the adjustment of the microphones
- Make sure, that all channel faders, gain and LINE TRIM controls of unused input channels are at their minimum setting. In this way you avoid unnecessary noise.

SETTING UP A STANDARD PA-SYSTEM

Main Mix

Position the master faders in the range between -30dB and -20dB .

- Establish a basic mix, using the channel faders, so that the individual sound levels relate to each other according to your personal taste.
- The best range for the channel faders to be set to is in the area of -5dB to 0dB . In this way you are provided with enough tolerance for later adjustments.
- Use the master faders to adjust the overall volume.
- In case you are using the FX units, please proceed as follows:
 1. Set the AUX1/FX1 send controls to their center position.
 2. Set the effects return fader of the FX1 unit to the -5dB mark.
 3. Use the UP/DOWN buttons to select the desired effect preset.
 4. Press the FX ON button.
 5. Play the sound source of the desired input channel and adjust the desired amount of the FX signal, using the FX controls of this input channel. Repeat this step for all input channels that you want to include in your effect mix.
 6. Adjust the AUX1/FX1 SEND controls, so that the Peak LED only lights frequently at highly dynamic signal peaks.

If necessary, repeat steps 1 - 6 for the second internal FX unit (FX2).

Monitor Mix

For now, let's presume, that you don't use the Powermate as FOH-mixer in the audience area but on-stage. The following procedure is explained for AUX3. For setting AUX4, please perform the same steps analogous.

- Lower the setting of the AUX3 fader located in the master section.
- Engage the AUX3 POST button located in the master section.
- Set the AUX3 faders of all input channels in use to their center position. In this way the main mix and the monitor mix are completely identical.
- Push the AUX3 fader up until a slight feedback noise is heard.
- Activate the FEEDBACK FILTER and adjust its control, so that the feedback noise disappears.
- Use the AUX3 fader to reduce the AUX3 level by about -6dB . This will provide you with enough "headroom" before feedback during the performance, even then, when some microphone positions are changed disadvantageously.
- Use the FX to AUX3 controls to add the effect mix to the monitor mix, without influencing the main mix. Normally, the monitor mix needs less FX than the main mix.

Let the artists perform some and check the sound of the system from different angles and distances. If you come to the conclusion that some corrections in the overall sound image are necessary, activate the 7-band equalizer and match the sound to your liking. By doing so, you should keep in mind, that during the performance the sound is going to be altered because the audience is present, which has a major effect on the acoustical condition of the location, the degree of first reflections, and the absorption of low frequencies. If possible, you should check the "sound in the house" during the performance and – if necessary – adjust it to the changed conditions.

And for the rest, we like to wish you lots of fun and success with your new PowerMate mixer.

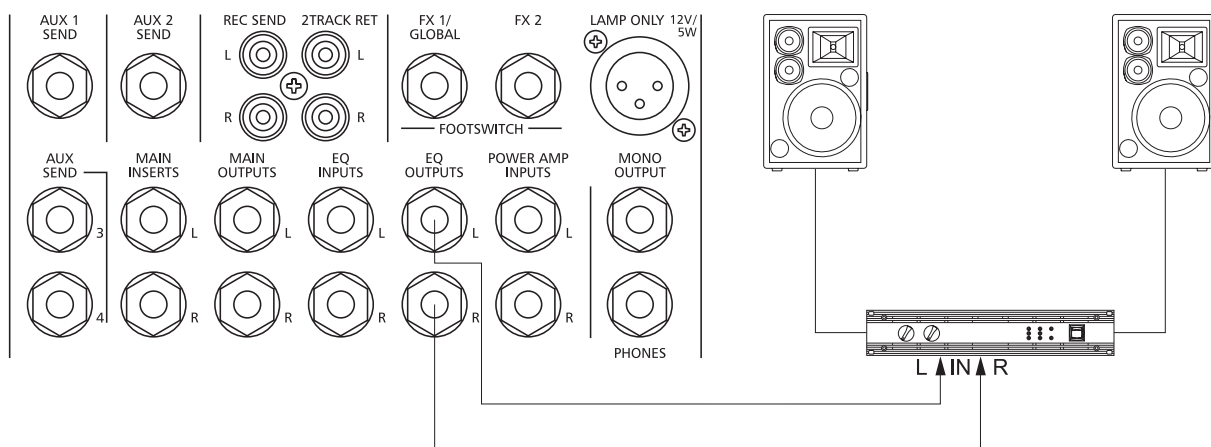
MASTER PATCHBAY AND DIFFERENT SETUP ALTERNATIVES

The patch field within the master section is referred to as MASTER PATCHBAY

The mixer's Line output levels, return and insert connections are to be found here. To provide you with a wide range of connection possibilities, the MASTER INSERTS, MAIN OUTPUTS, EQ INPUTS and EQ OUTPUTS, POWER AMP INPUTS, and the AUX SENDS and AUX RETURNS can be independently connected with each other or routed to external devices. In the basic configuration – when no plugs are inserted into any of the MASTER INPUT connectors – signals are patched internally and fed to the internal power amplifier. Once you connect a plug to the INSERTS, EQ INPUTS, or POWER AMP INPUTS, the internal signal path is interrupted, providing you with the opportunity to include external signals. Following, we would like to show you some typical examples of how to use the MASTER PATCHBAY.

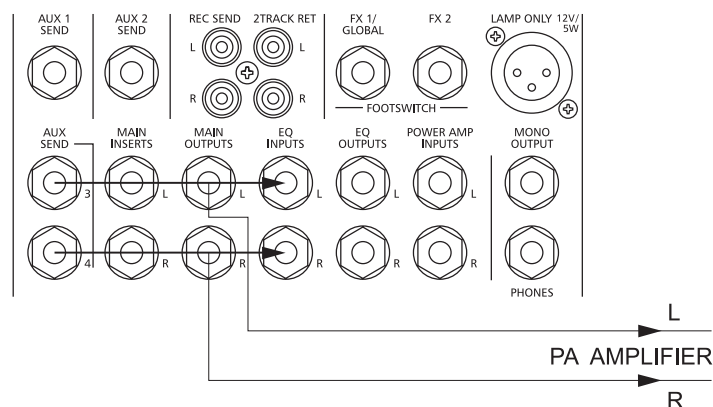
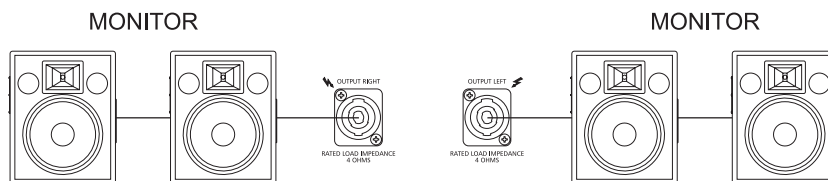
1. Connection of an external power amplifier:

If you need to connect more loudspeaker systems than the PowerMate is capable of handling directly, you have to use an external power amplifier. Using LF-cables with phone plugs, you can patch the signal either at the MAIN OUTPUTS – pre EQ – or at the EQ OUTPUTS – post EQ. In this configuration the signal path to the internal power amplifier is not interrupted and the audio signal is outputted via the speaker systems connected to both amplifiers.



2. Using the internal power amplifier for monitoring purposes:

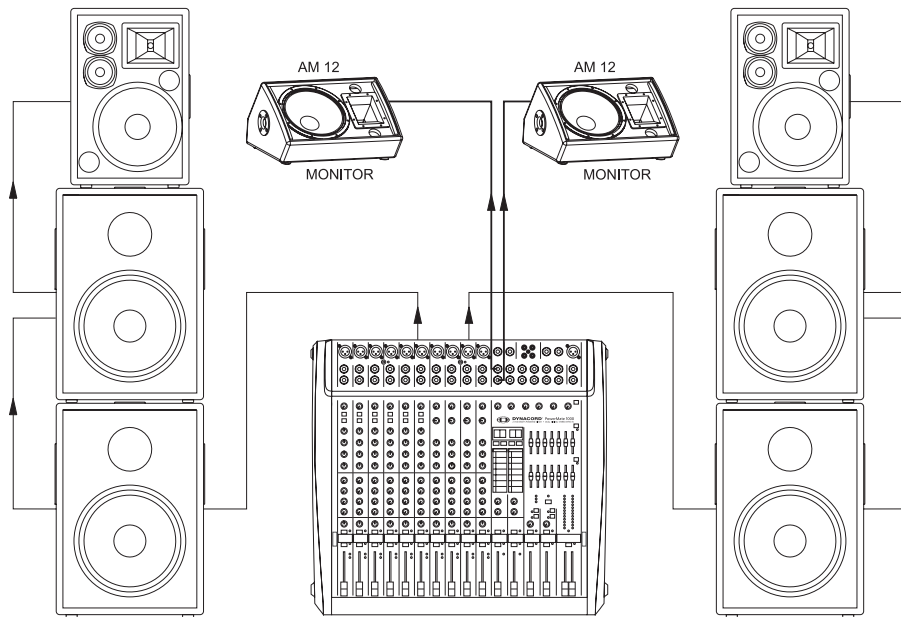
In case you want to use an external power amplifier to drive your main speaker systems, the internal power amps can be used for monitoring and side-fill purposes. Use short patch-cables to connect the AUX3 or AUX4 OUTPUT to the EQ inputs (see diagram). The monitoring signal is fed to the internal power amps, providing you with the possibility to connect passive monitor speaker systems.



MASTER PATCHBAY AND DIFFERENT SETUP ALTERNATIVES

3. Maximum amount of speakers in a passive configuration:

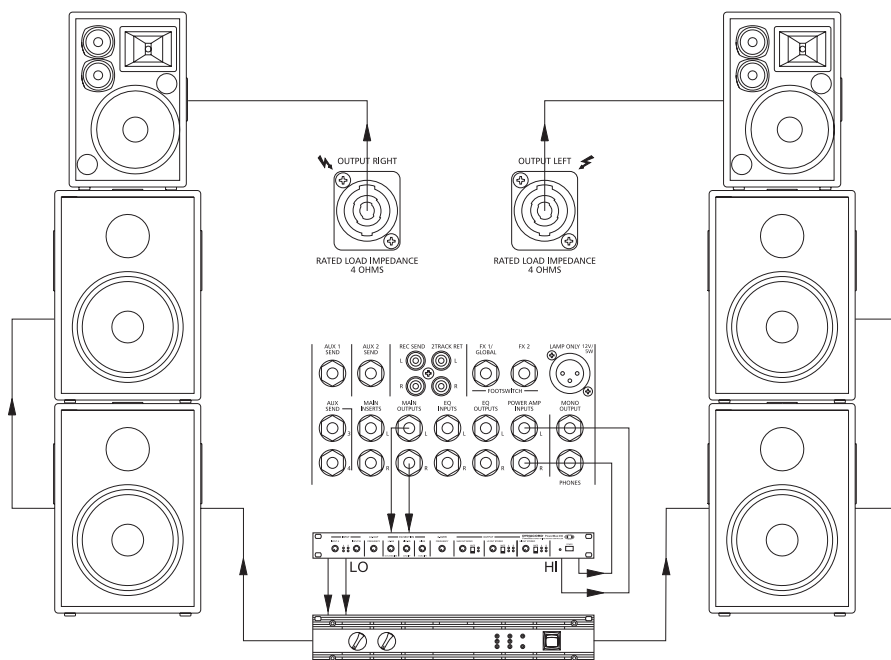
The PowerMate allows the maximal connection of three loudspeaker cabinets with an impedance of 8 ohms per power amp output channel. In other words: the internal power amplifier is capable of driving a maximum of six 8 ohms speaker systems. The following diagram shows an example of how to set up your PowerMate for operation with the maximum amount of speakers connected.



Usual power mixer applications do not include a monitor amps rack. Thus, active monitor systems, like the DYNACORD AM12 for example represent a convenient alternative.

4. Active 2-way stereo configuration:

This example uses the internal power amplifier of the PowerMate to drive the Hi/Mid cabinets. The full-range signal is fed via MAIN OUTPUTS or EQ OUTPUTS to an active crossover. The Lo-signal outputs of the x-over are connected to an external power amplifier, driving the woofer cabinets. The signal of the x-over's Hi-signal outputs is fed back to the PowerMate's internal power amplifier via POWER AMP INPUTS. Compared to the passive configuration, the overall sound gains transparency and higher sound pressure levels are possible, since the Hi/Mid cabinets do not have to deal with the low frequency signals.

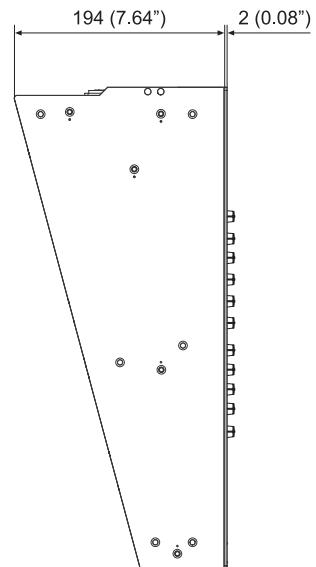
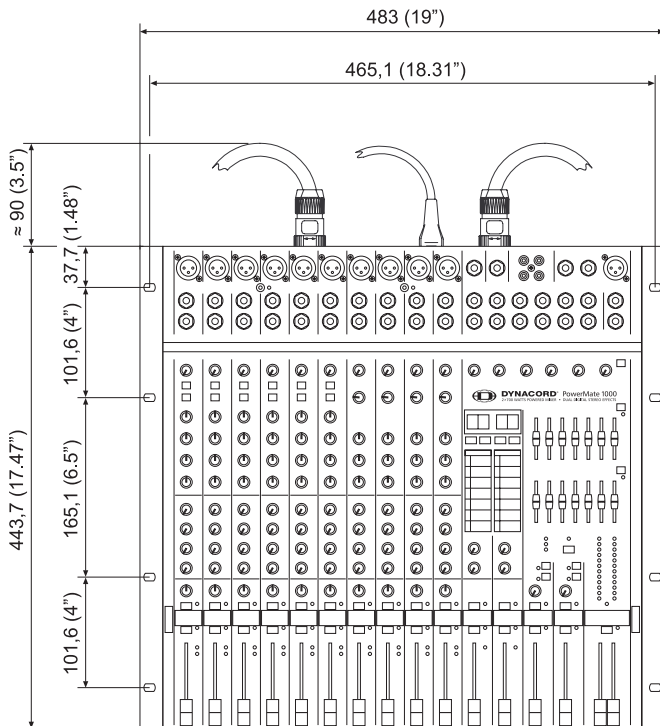
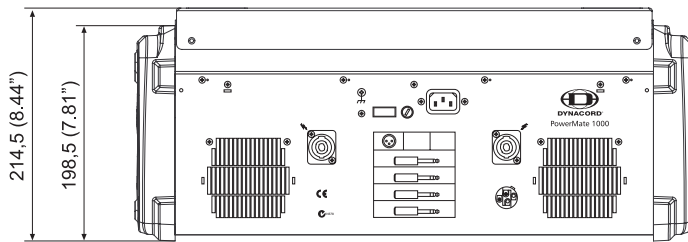
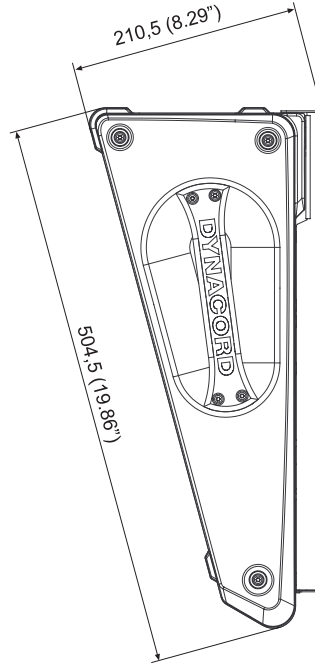
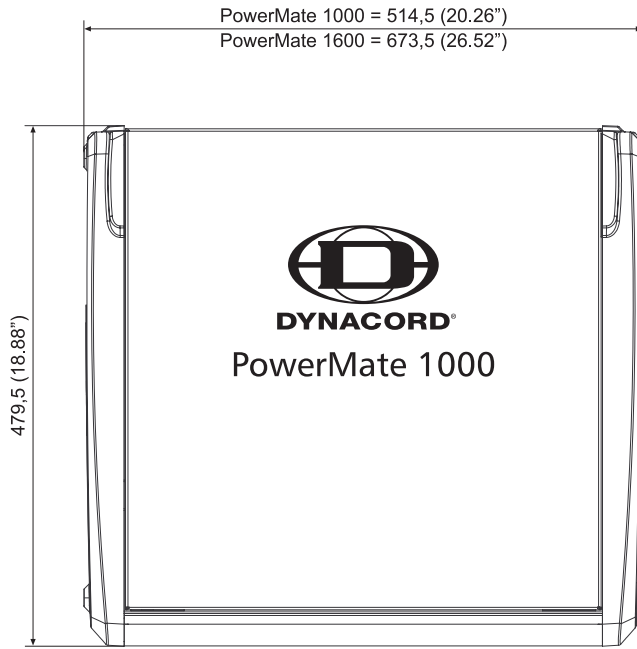


SPECIFICATIONS

Technical Specifications PowerMate1000/PowerMate1600 Mixing desk in rated condition, Unity Gain (MIC Gain 20 dB), all faders position 0 dB, all pots in mid position, master fader + 6dB, amplifier rated output power into 8 ohms, dual channel, unless otherwise specified.

Maximum Midband Output Power , 1 kHz, THD=1%		
into 2.66 Ohms		2 x 870 W
into 4 Ohms		2 x 700 W
into 8 Ohms		2 x 430 W
Rated Output Power , THD=0.1%, Single Channel		
into 4 Ohms		2 x 700 W
into 8 Ohms		2 x 350 W
Maximum Output Voltage of power amplifier, no load		70 Vrms
THD at 1kHz, MBW=80kHz		
MIC input to Main L/R output, +16 dBu, typical		< 0.005%
Power amplifier input to Speaker L/R output		< 0.01%
DIM 30 , power amplifier		< 0.01%
IMD-SMPTE , power amplifier, 60Hz, 7 kHz		< 0.01%
Frequency Response , -3dB ref. 1kHz		
Any input to any Mixer output		15Hz ... 80kHz
Any input to Speaker L/R output		20Hz ... 70kHz
Crosstalk , 1kHz		
Fader and AUX-Send attenuation		> 85 dB
Channel to channel		> 80 dB
CMRR , MIC input, 1kHz		> 80 dB
Input Sensitivity , all level controls in max. position		
MIC input		-74 dBu (155 µV)
LINE Input (Mono)		-54 dBu (1.55 mV)
LINE Input (Stereo)		-34 dBu (15.5 mV)
Power Amplifier Input		+6 dBu (1.55 V)
Maximum Level , mixing desk		
MIC inputs		+ 21 dBu
Mono Line inputs		+ 41 dBu
Stereo Line inputs		+ 30 dBu
All other inputs		+ 22 dBu
Record Send output		+ 14 dBu
All other outputs		+ 22 dBu
Input Impedances		
MIC		2 k ohms
Insert Return		2.2 k ohms
EQ Input and 2 Track Return		8 k ohms
All other inputs		> 15 k ohms
Output Impedances		
Record Send		1 k ohms
Phones		47 ohms
All other outputs		75 ohms
Equivalent Input Noise , MIC Input, A-weighted, 150 ohms		-130 dBu
Noise , Channel inputs to Main L/R outputs, A-weighted	PM1000	PM1600
Master fader down	-95 dBu	-95 dBu
Master fader 0 dB, Channel fader down	-90 dBu	-88 dBu
Master fader 0 dB, Channel fader 0 dB, Channel gain unity	-83 dBu	-82 dBu
Signal/Noise-Ratio , power amplifier, A-weighted		105 dB
Equalization		
LO Shelving		± 15 dB / 60 Hz
MID Peaking, mono inputs		± 15 dB / 100 Hz ... 8 kHz
MID Peaking, stereo inputs		± 12 dB / 2.4 kHz
HI Shelving		± 15 dB / 12 kHz
Master EQ, 2x7-band, 63, 125, 400, 1k, 2k5, 6k, 12k Hz		± 10 dB / Q=2.0
Power Consumption at 1/8 maximum output power, 4 ohms		640 W
Dimensions , (WxHxD), mm		
PowerMate1000		514.5 x 210.3 x 478.7
PowerMate1600		673.5 x 210.3 x 478.7
Weight , without lid / including lid		
PowerMate1000		20 kg / 21 kg
PowerMate1600		23.5 kg / 25 kg
Optional		
RMK-1000 (Rack-Mount-Kit PowerMate1000-2)		112 698
Gooseneck Lamp, 12V/2.4W, 12", XLR		112 700
FS11 (Footswitch)		110 693

ABMESSUNGEN/DIMENSIONS



RACK MOUNTED



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Germany EVI AUDIO GmbH, Hirschberger Ring 45, D 94315, Straubing, Germany Phone: 49 9421-706 0, FAX: 49 9421-706 265

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