948 Power Conditioner

The quality of the power supply has become one of the most important components of a high-end music system. Because of the switchable power supplies of computers, TV sets, microwave ovens or light dimmers high-frequency noise and DC components are super- imposed on the mains supply. At times the standing DC component is big enough to cause hum in normally quiet transformers. Also, the sound coming from a music system may change depending on the time of day or day of the week, suddenly becoming colorless and weaker. For the dynamic suppression of superimposed DC components Burmester has developed a patented switching circuitry. Additionally, the 948 contains top-quality filters against high-frequency noise.

948 Power Conditioner

THE PROBLEM TO BE SOLVED

Increasing noise pollution in our power lines renders the AC voltage (nominal 120 volts, 60 Hertz) that comes out of our wall outlets one of the weakest links in the high end audio chain. Who has not experienced the phenomenon that a music system doesn't sound as good between six and ten in the evening as it does at midnight? The reason: The power that flows from the wall outlet at midnight is much cleaner than that of a few hours earlier. What causes this effect? Burmester Audiosystems identified after some basic research a noise component in the power supply that is solely responsible for the sound deterioration. We measured a miniscule direct current of a few millivolts in the AC voltage. Not only was this DC component not supposed to be there it also varied it's strength over time. As it increased the sound of the system got worse. Available line filters did nothing to deal with this kind of line pollution. This is too bad because a few millivolts of DC are enough to drive amp transformers of any brand to the saturation point which becomes audible as transformer hum. As is widely known, the pure-bred transformers of high end-amplifiers are particularly susceptible to DC components in the power supply.

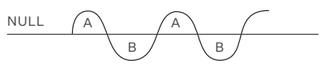
SPECIAL FEATURES OF THE 948: PATENTED ACTIVE DC SUPPRESSION

The power conditioner 948 functions unlike any other line filter on the world market. Basically, the 948 is a 500 W power amplifier that works in parallel with the AC power supply and compensates as an active system any DC components in the 120 volts AC from the wall outlet. With common passive filters this would only be possible at the price of deteriorating sound. The active DC suppression works on all eight outlets of the 948 and it can be switched on and off.

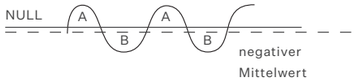
THE SECRET OF THE 948

The task of the power conditioner is, simply stated, to keep the average phase difference of the AC power supply at zero. An average other than zero means that direct current is present in the alternating current of the household power.

Ideal (balanced) AC voltage:



In the phase-plane diagram of the AC voltage the waveshape of the phase alternates around the zero line of the neutral conductor. In an ideal AC power situation the area plotted by the positive half-wave (A) above neutral equals that by the negative half-wave (B) below it. Ideally, the mean value when adding positive and negative areas over time should be zero, indicating that no DC voltage is present.
Unbalanced AC voltage:
There are many electrical loads that absorbe more power on one half, positive or negative, of the wave cycle than on the other. This is particularely true for appliances with generalized phase control which do not control the two half-waves identically, such as dimmers, motor power controllers, computers, microwaves, TVs or hair dryers which control power to the heating element by connecting a diode in series. Even remote large loads such as heavy electrical equipment on a nearby construction site strongly effect the quality of the AC voltage supply in the power system. If a load absorbes more power from one half-wave than from the other the voltage drop in the system is larger for the strained half of the wave cycle than for the other. Consequently, the wall outlets of a power system under unbalanced loads will supply AC voltage with a phase-plane diagram in which one half-wave is smaller than the other. In a simplified graph it would look like this: Mean value of an unbalanced AC voltage supply (DC component)
In an unbalanced AC voltage supply the area plotted by the positive half-wave is unequal the area plotted by the negative half-wave. Their addition renders a value other than zero, meaning the mean of the AC voltage is unequal zero, hence there is a DC component in the power system. Unbalanced AC voltage and transformers
A transformer hooked up to an unbalanced AC voltage is constantly carrying



direct current. This leads to a strong magnetic bias in its core, the transformer starts to hum. This problem increases the lower the resistance in the windings and the higher the magnetic flux in the core is. In other words, the more powerful and dynamic a transformer is designed the more susceptible it is to DC components in the power system. In good transformers even miniscule DC components of a few 10 mV are audible.

HOW THE POWER CONDITIONER 948 WORKS

The power conditioner 948 measures the mean value of the supply voltage and adjusts it to zero by putting additional load onto the larger half-wave. In other words it assures that the voltage drop in the system is identical for the positive and negative half of the wave cycle. Hence, transformers no longer have to cope with direct current and stop humming. It is important to note that the power conditioner works in parallel with the connected audio components and thus avoids an undesirable damping of the voltage supply. This circuit logic is unique on the world market and has been patented by Burmester Audiosystems

AND HOW DOES IT SOUND?

A power supply corrected by the power conditioner provides the connected audio components with clean and even voltage. The result is a totally open sound. There is more air around voices and instruments, large orchestras and choirs sound natural and unstrained – even at high volumes. The tonal balance of music becomes sweeter. This improvement, of course, is independent of the time of day. With the 948 an audio system sounds as good all day as it normally sounds only way past midnight, when no spurious loads pollute the power system. We recommend visiting your authorized Burmester dealer and trying a 948 out for several days. It will improve the sound of any brand of audio equipment. It's outstanding sonic qualities have earned the 948 recognition worldwide. The absolute sound awarded it four stars and wrote: „Incomparable and in a class by itself..“. Many editors of audio magazines around the world use the 948 as an important tool

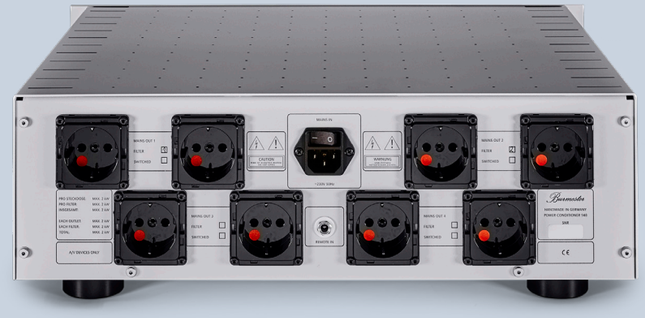
WHAT DO OTHER POWER CONDITIONERS DO?

Many competing products try to keep line noise away from high end audio systems by stabilizing the voltage or synthesizing the supply system. However, this can easily compound the problem by destroying the low resistance of the voltage supply. Only a low-resistance system can supply large amounts of power in the shortest time. Higher resistance limits the overall power of the connected components. This leads to a limp bass reproduction, for example. The 948 avoids this danger altogether by functioning in parallel to the supply system, meaning that the power does not flow through the power conditioning section. The 948 does not work in series with the connected audio components, it effects the voltage supply from the outside, so to speak, without impeding or limiting it. The 948 is not designed to stabilize the voltage supply, which would make little sense anyway because most high end components have their own voltage stabilizers. Common power filters based on the isolating transformer principle oftentimes only limit parasytic RF noise above 100 kHz. Also, they work in series with the connected components and limit the power flow, thus, are not usable for power amplifiers. The two RF line filters of the 948 kick in at very low frequencies (-6dB at 2000 Hz).

ADDITIONAL FEATURES OF THE 948

Two additional RF filters to filter out parasytic RF noise for example from digital components or from tuners. These filters have a steep-slope characteristic: -6dB at 2kHz, -20dB at 20kHz and already –60dB at 100 kHz! Hence, digital components or tuners should preferably be hooked up to outlets with RF filter. In all, eight audio components can be hooked up directly to the power conditioner. On all outlets and on the AC plug of the power conditioner the phase has been marked. Mass between the eight outlets has been star-connected. With our preamplifiers and D/A converters that have a variable output the outlets of the 948 can be remotely switched on and off. The display of the 948 indicates DC offset and voltage. The display can be switched off. We recommend connecting power amplifiers to the four outlets without RF noise filters.

PRODUCTINFORMATION
948 POWER CONDITIONER
POWER CONDITIONER



948
PowerConditioner

TECHNICAL SPECIFICATIONS

Weight	17 kg (37.5 lbs)
Width	482 mm (19“)
Height	153 mm (6.1“)
Depth	368 mm (14.5“)
Star–grounded power outlets	8
Active DC compensation without power limitation	yes
Phase indication of AC mains connector and sockets	yes
Star–grounded protective earth conductor RF filters to filter distorting	yes
RF noise	2
REMOTE INPUT / OUTPUT	1 / 0

Technical modifications reserved.

SPECIAL CHARACTERISTICS

— Completely certified by VDE and TÜV, conforms to CE guidelines. The 948 conforms to all electrical safety standards (separatly grounded inner housing)
— Electrically and magnetically triple-shielded Burmester Power 2.5 power cord of 2 m length is the standard AC cord. Longer power cords optional.
— We recommend using triple-shielded Burmester Power 2.5 power cord also for all other connected components to avoid polluting your just cleaned voltage supply with RF noise.
— Power outlets can be custom configured as switched/ unswitched and filtered/ unfiltered. Please specify your configuration when ordering the 948. For details, please contact your Burmester dealer.

CONNECTIONS

— Eight power outlets
— Absolutely no power limitation for components connected to the outlets without RF filtering. 10 volts DC-Input for remote switching by Burmester preamps
— Electrically and magnetically triple-shielded Burmester Power 2.5 AC cord as standard power connection (2m length).

Burmester Audiosysteme GmbH

Burmester Audiosysteme GmbH is one of the world's most renowned manufacturers in the field of high-end audio systems. The owner-managed company based in Berlin was founded in 1977 by Dieter Burmester. With a clear focus on home and automotive audio, Burmester maintains global collaborations with industry leaders in other industries (including: Mercedes-Benz, Porsche and the Königliche Porzellan Manufaktur Berlin, among others) and is a member of Meisterkreis Deutschland and the Initiative for German Manufactures.