dbx

MODEL 563X

THE SILENCER

PERFORMER SERIES SINGLE-ENDED NOISE REDUCTION

Instruction Manual

WARNING

TO PREVENT FIRE OR SHOCK HAZARD,
DO NOT EXPOSE THIS COMPONENT
TO RAIN OR MOISTURE.

This triangle, which appears on your component, alerts you to the presence of uninsulated dangerous voltage inside the enclosure -- voltage that may be sufficient to constitute a risk of shock.

This triangle also appears on your component, and it alerts you to important operating and maintenance instructions in this accompanying literature.

CAUTION
To Reduce Further the Risk of Shock, Do Not Remove the Cover or Back. There Are No User-Serviceable Parts Inside; Refer All Servicing to Qualified Personnel.

INSPECTION and INSTALLATION

Your unit was carefully packed at the factory in a protective carton. Nonetheless, be sure to examine the unit and the carton for any signs of damage that may have occurred during shipping. If there is such evidence, don't destroy the carton or packing material, and notify your dealer immediately.

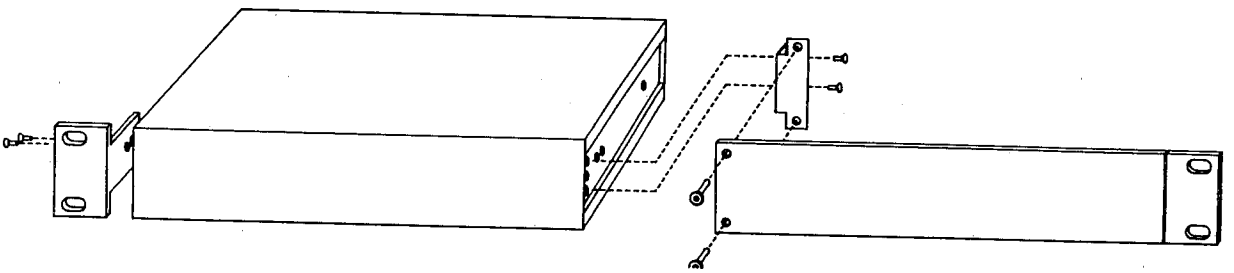
It's a good idea in any case to save the carton and packing should you ever need to ship the unit.

In the event of initial problems, first contact your dealer; your unit was thoroughly inspected and tested at the factory.

The carton should contain this owner's manual, a 563X of course, and a warranty/registration card. Please fill the card out and send it to us. The carton also should contain hardware for rack-mounting both a single unit (screws, a long ear [half-rack width], a small L-bracket, and a short rack ear) and two units together (side plates along with a screwdriven joiner). See below.

No special ventilation is required in any installation; other components may be stacked above or below your 563X provided they don't generate excessive heat.

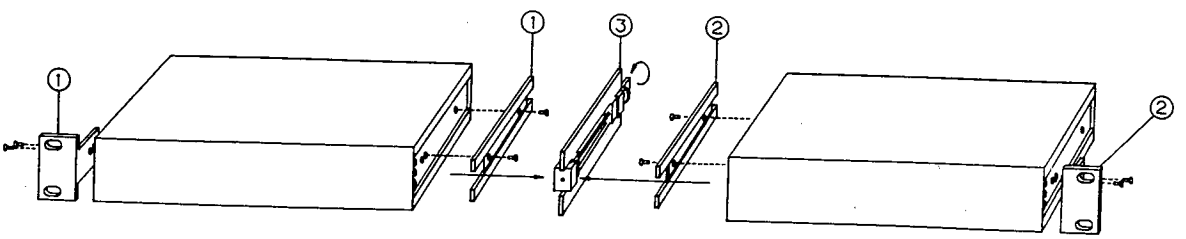
Here's rack-mounting for a single unit:



It may help to line everything up on a table as you tighten the screws.

Here's rack-mounting for a pair of 563Xes or for a 563X and dbx 163X Compressor/Limiter, 263X De-Esser, 463X Noise Gate, 150X Type I NR unit, or other suitable half-rack unit:

1 & 2) Attach side panels;
3) Bring units together, lining up the side panels with the screw-joiner catches, and then gently tighten the screw to close the catches.



CONTENTS

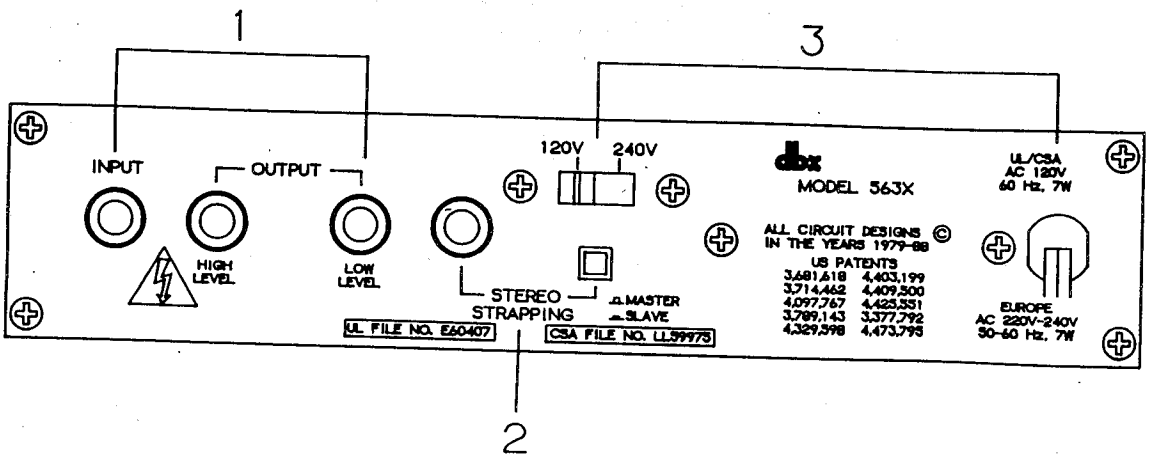
PERFORMANCE SPECIFICATIONS

Filter	2nd-order, minimum-phase design topology, operates 1.3-38 kHz depending on setting
Frequency response	20 Hz-20 kHz ±1.5 dB on high-level pink noise
THD	0.06%
IMD	0.1%
Equivalent input noise	-82 dBv
Input impedances	391 k-ohms, single-ended
Output impedances	High-level: 22 ohms, for driving 600 ohms or greater Low-level: 900 ohms, for driving 10 k-ohms or greater
Input gain	Front, 0-20 dB Rear, 0 dB
Output gain	High-level: 0 dB Low-level: -20 dB
Maximum input and output	18 dBv
Power requirements	See rear of unit

Notes

1) Specifications are subject to change.
2) All voltages are rms (root-mean-square).
3) 0 dBv is defined as 0.775 V regardless of load impedance; subtract 2.2 from the dBv figure to convert to dBV (i.e., referred to 1 V). When the load impedance is 600 ohms, this particular dBv is also known as "dBm."
4) Noise figures are for 20 Hz-20 kHz unweighted.
5) IMD is SMPTE: 60 & 7k Hz mixed 4:1, output 1 V.
6) Inputs and outputs have identical polarity.
7) "dbx" is a registered trademark.

REAR



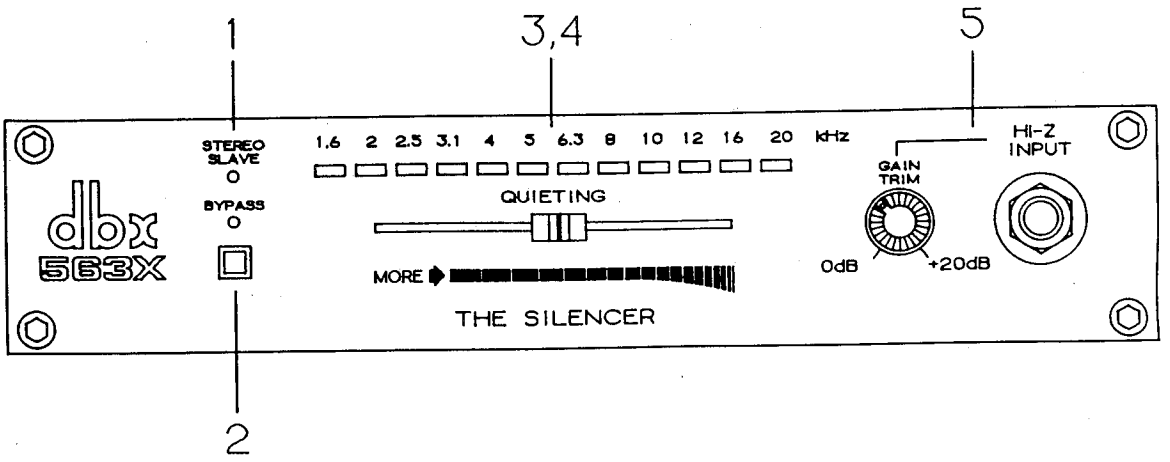
1 INPUT and HIGH-LEVEL and LOW-LEVEL OUTPUTs. These jacks are for a line-level input and ouput and are the standard 2-circuit ("mono") 1/4" phone type, where the tip carries the signal and the sleeve carries the ground. Low-level is 20 dB below High-Level. High-level is for typical applications like returning the quieted signal to a console or mixer. Low-level would be better-suited for devices that require signals in the 100 mV range, like the input to a guitar amp.

2 STEREO STRAPPING jack and MASTER/SLAVE button. Connect this jack to the same jack on another 563X, with one button switched to master and the other to slave, and you have a true rms-detecting stereo single-ended-noise-reduction system. This preserves imaging and sonic balances in a stereo program. The jack is a 1/4" 3-circuit ("stereo") phone type (tip/ring/sleeve); use 3-circuit plugs and cables only, for anything else won't work. Of course, be sure to disconnect everything for independent operation. See Setting Up.

Note that you must leave the Master/Slave button out, at Master, for normal (non-stereo) operation as well as for stereo operation as a Master. Pushing it in, to Slave (the front-panel LED will light), deactivates the Quieting slider and forces the unit to obey the Master's settings when a second 563X is properly connected and switched.

3 VOLTAGE SWITCH. This must be properly set for your ac voltage; be sure to check before plugging in and powering up. For nominal 220-V operation an adaptor plug on the ac cord will be required.

FRONT



1 STEREO SLAVE LED (light-emitting diode). See previous page; this indicates that the unit has been set by its rear switch to be the Slave in a 563X stereo quieting pair.

2 BYPASS LED and button. Pushing this button removes the Quieting (noise-reduction) circuitry for instant comparisons. The input preamp and output buffer are still in the circuit (which means this is not a "hardwire bypass").

3 QUIETING LEDs. These 12 LEDs show the frequency range the music is extending up to and, going the other way, the point the constant noise you're silencing is being filtered down to. In other words, what frequencies are being held back.

4 QUIETING slider. Adjust this slider until you have a minimum of hiss along with little or at least acceptable loss of highs. Strike a good compromise. If source levels change and background hiss levels change, even if the frequency spectrum and bandwidth of the signal change, you will probably have to readjust. See Applications.

5 Hi-Z GAIN TRIM and INPUT JACK. This thumbscrew knob sets the gain of the preamp for the Hi-Z input. All the way right, or clockwise, is +20 dB, and all the way left (ccw) is unity (0 dB) gain. This connects to the 563X's low-noise fet preamp. There's enough gain that virtually all low-level instruments can be plugged in directly -- guitars, basses, keyboards, even high-impedance mikes.

SETTING UP

Which Input?

Use the rear-panel (line) input in recording when the instrument to be quieted is already preamplified, such as through a direct box or mixing console. Synthesizers sometimes can plug in here, too. And of course when mixing or submixing, the signal from the deck (or mixing console) goes here as well.

In performance, this input is useful for connection to synthesizer high-level outputs or line-level outputs of guitar and bass preamps (before the feed to the power amp).

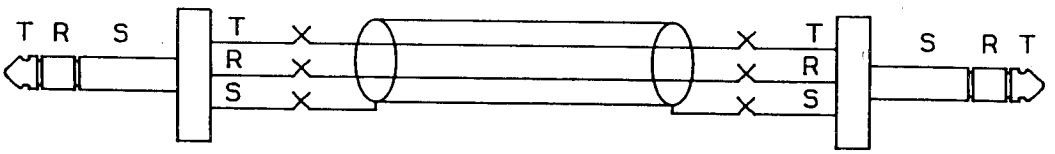
The front-panel Hi-Z overrides (takes precedence over) any connection to the rear-panel input. It is handy to use the front input in the studio for adding quick (direct-input) overdubs and for the convenience of being able to carry a guitar or bass into the control room -- even if the line input is wired to the patch bay. In performance, any instrument can plug directly into this input (synths included), as well as most high-impedance mikes.

Set the thumbscrew gain trim to achieve your desired operating level, remembering that the Quieting slider setting will be governed by the noisiness (the noise signal level) of the program, as is discussed in Applications. To adjust the gain, play your instrument or mike through the 563X with the slider to the far left. Listen to the output of the 563X. Turn the Hi-Z trim down (ccw) until any distortion disappears. If distortion is audible with the trim all the way down, the problem's not in the 563X.

Stereo

True stereo quieting, as opposed to dual-mono quieting, which you can achieve with two independent 563Xes, is important when a stereo signal is to be cleaned up and its channel balance and imaging preserved. Dual-mono quieting won't do this; instruments or vocals can wander or jump around, because the two channels may well have different high-frequency content at different times. With a pair of 563Xes giving you true rms stereo tracking, the filters in each channel will be in exactly the same place at the same time and your sound and your mixes will readily show the benefits.

Use this mode whenever imaging and L/R balance must remain stable. A cable as shown below is what's needed to link two 563Xes. It's 2-conductor shielded (3-wire) with standard 1/4" tip/ring/sleeve phone plugs at the ends. Shielding is essential, and keep the cable short, too, to minimize hum pickup. Don't use mono cable or plugs (tip/sleeve) lest you damage the 563X rms detectors.



3-Circuit ("Stereo") Plugs and Dual-Conductor Shielded Cable

Don't fail to disconnect the units from ac power when hooking up a stereo pair; you'll avoid a potentially loud (and damaging) pop.

Also see the assembly drawing at the bottom of the inside front cover.

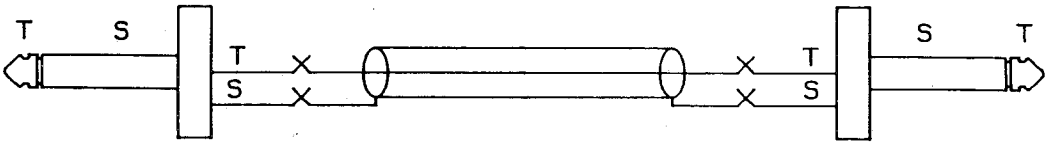
After you've decided which unit is the Slave by pressing in the rear button, the yellow LED on the front will light. As explained earlier, the Quieting slider will be inactivate (will have no effect) and the LED bar graph will be blank since the amount of attenuation is exactly the same for both Master and Slave. All other controls, e.g., Bypass and Hi-Z Gain, remain active and independent.

When you want to have two independently operating units, as we have said, remove the strapping cable and leave both Master buttons out.

HOOKUPS

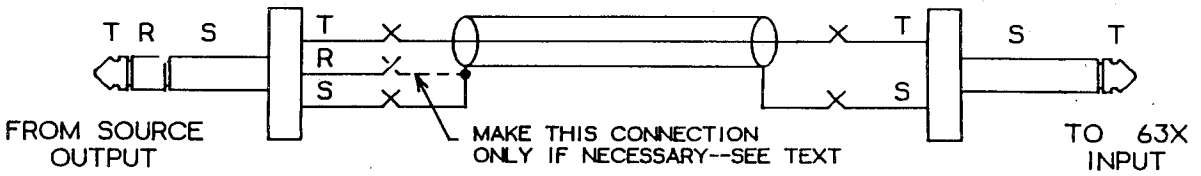
Inputs and Outputs

The inputs and outputs are single-ended (unbalanced) and should be connected to other such equipment with single-conductor shielded cable, as shown here.



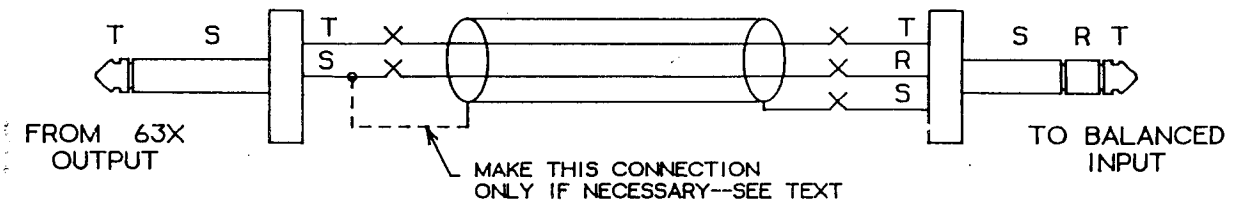
2-Circuit ("Mono") Plugs and Single-Conductor Shielded Cable

This will work fine for balanced inputs, too, but if the 563X input is connected to source equipment with balanced outputs, the next hookup should be used. Most balanced sources will work without the dotted connection between the ring (-) output and the sleeve (the ground -- this is true for "active-balanced" and "ground-referenced" outputs). This floating condition unbalances a balanced source, which is usually okay. However, some sources require the dotted connection, e.g., "transformer-isolated" balanced outputs. We recommend making the connection only if necessary for your installation, because some active balanced and ground-referenced outputs may be damaged by doing so. Consult the product's manual or manufacturer.



Balanced Outputs and the 563X Line Input, Single-Conductor Shielded Cable

To take advantage of the balancing capability provided by the balanced inputs, the following connection may be used when the 563X output is connected to a device with balanced inputs.



Balanced Inputs and the 563X Line Output, Two-Conductor Shielded Cable

The connection between the shield and the sleeve at the 563X end of the cable should be made only if hum develops in your installation.

APPLICATION NOTES

The 563X Silencer contains one channel of single-ended, one-step noise reduction for sources that have a continuous, unchanging hiss "floor." For cleaning up program signals over this background noise, this very fast sliding-filter design is generally unobtrusive and remarkably effective, whether the hiss is a little or a lot.

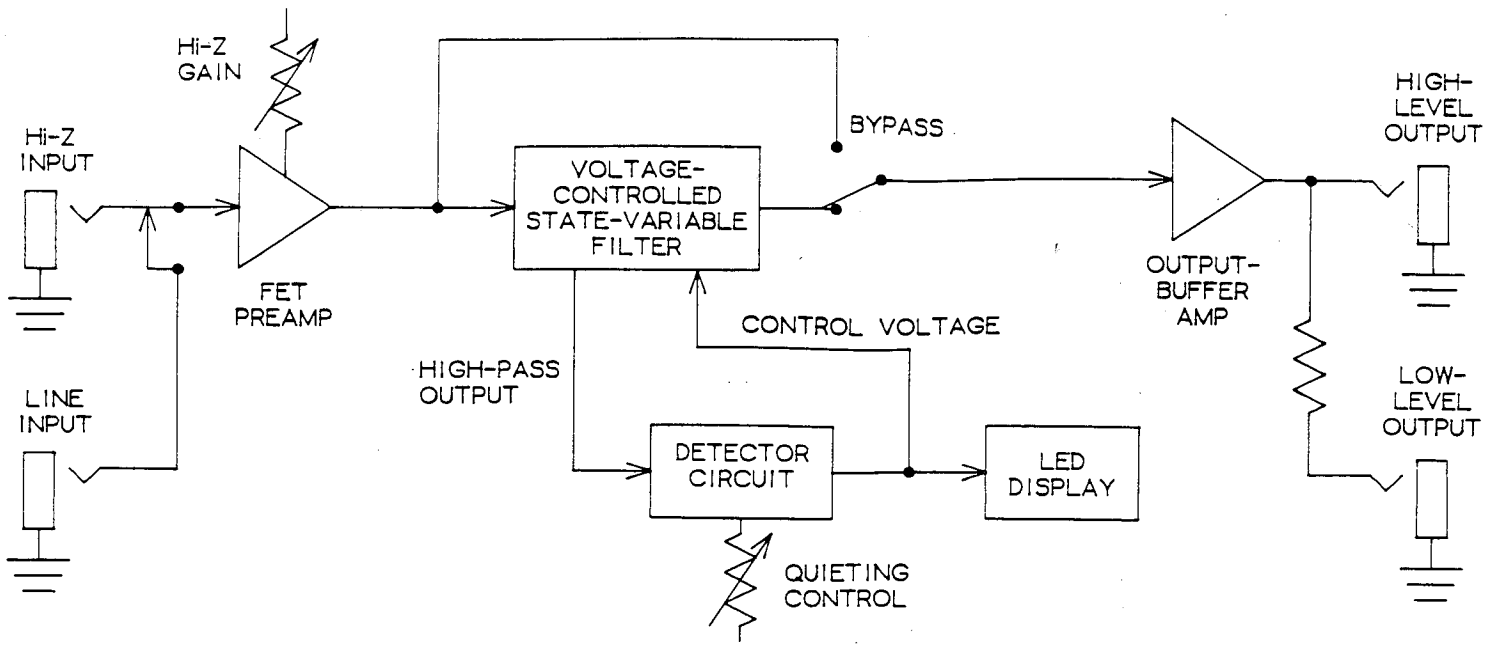
Please realize that the design is NOT intended to remove hum, ticks and pops, or to track modulating or changing hiss, nor to quiet down noisy material that has been dynamically processed.

Properly set, the 563X reduces or audibly eliminates constant hiss with little or no sacrifice of treble overtones. To discuss what "properly set" means, let's look at the Quieting slider. The slider setting answers the question, How much constant noise energy is going to get thrown away? The quick internal filters that trim off the constant hiss will open up regardless of the slider setting if genuine dynamic information comes along -- for example, when a cymbal crashes. How far the filter opens up depends on how much noise energy it's set to throw away -- in other words, where the slider is positioned within its range.

The control range is centered on a likely usage area, of course, which you can fine-tune up or down. Over time, at the difficult extremes of problem material, you will find that some imperfect material is nonetheless quiet enough to call for only a little bit of quieting. Any more and you'll be intruding on the sound, coloring it or making it sound otherwise peculiar. Similarly, some very noisy material should be filtered only somewhat, and for the same reasons -- to intrude as little as possible, to get noise reduction without coloration or strange noise modulation.

The key, always, always, is to use your ears. Don't let your enthusiasm cause you to overdo it. Listen closely for breathing and noise modulation and noise-floor coloration, and allow a little residual hiss for the sake of naturalness and unprocessed sound. The 563X is extremely effective but it's not miraculous. It's a signal-processing tool. We know how well it cleans and unmasks the music, how it seems to strengthen it, even, restoring bite and power and clarity. Just keep your critical judgment unclouded.

USER NOTES.


Hi-Z
GAIN
Hi-Z
INPUT
BYPASS
VOLTAGE-
CONTROLLED
STATE-VARIABLE
FILTER
HIGH-
LEVEL
OUTPUT
FET
PREAMP
OUTPUT-
BUFFER
AMP
CONTROL VOLTAGE
HIGH-PASS
OUTPUT
LOW-
LEVEL
OUTPUT
LINE
INPUT
DETECTOR
CIRCUIT
LED
DISPLAY
QUIETING
CONTROL

WARRANTY and FACTORY SERVICE

All dbx products are covered by a limited warranty (warranties for products purchased outside the USA are valid only in the country of purchase and the USA). For details, consult your warranty/registration card or your dealer/distributor.

dbx Customer Service will help you use your new product. For answers to questions and information beyond what's in this manual, write to:

dbx Professional Products
8760 South Sandy Parkway, Sandy, UT 84070
Telephone (801) 568-7660 Fax (801) 568-7662

Should problems arise, consult your dealer or distributor. If it becomes necesary to have your equipment serviced at the factory, repack the unit, including a note with a description of the problem, your name, address, and phone, and the date of purchase, and send the unit freight prepaid to the above street address, marking it Attn: Repairs.