MODEL 296

SPECTRAL ENHANCER



OPERATION MANUAL

INSPECTION

1. Verify that the 296 package contains the following:

- ☐ 296 Unit and External Power Supply
- ☐ Operation Manual (including Registration Card)

INTRODUCTION

Congratulations on choosing the dbx 296 dual-channel Spectral Enhancer. We recommend that you take a moment and read through the manual as it provides information that will assist you in using your unit to its fullest potential.

The 296 takes a new and innovative approach to restoring detail to instruments, vocals and mixed program material on stage or in the studio. Unlike exciters and static HF boosters, which add distortion artifacts and hiss to the processed signal, the 296's "intelligent" circuitry acts dynamically and interactively to reduce hiss while dramatically improving detail and clarity. Its dynamic shelving filter provides up to 9.5dB of hiss reduction while leaving legitimate high frequency program content untouched.

The HF Detail circuitry in the 296 uses a dynamic shelving equalizer to provide results superior to even complex equalization. In many situations, the amount of high frequency content in the material you are working with will vary. Typical equalization schemes will produce results which are right some of the time, and completely wrong at other times. But not with the 296. The equalizer's dynamic operation and sliding corner frequency insure that high frequency enhancement is applied *only when needed* and in the *specific* frequency range necessary to maintain proper spectral balance moment to moment.

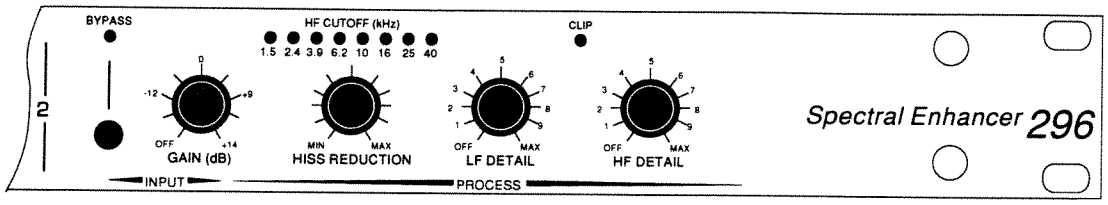
The LF Detail section in each channel of the 296 adds punch and definition at the lower end of the spectrum. As you increase the amount of LF Detail, this newly-developed dbx circuit boosts lower bass frequencies while *simultaneously* cutting problem frequencies in the upper bass/low midrange region which often muddy up program material. The 296 adds power and fullness to kick drums, electric synths and basses without ever getting boomy, flabby or muddy.

Use the 296 to resurrect older digital synths, add life to dull vocals and clarify cloudy guitar tracks without adding noise or harshness. Its HF Detail is also perfect for adding a nice, crispy edge to acoustic or electronic snare drums.

Note that the 296 is a through device and best results are obtained when it is used as a throughput device or with an insert. The 296 is not meant to be used in an effects loop. The 296's control settings will determine the "mix."

OPERATING CONTROLS

Front Panel



Note: The INPUT and PROCESS controls are available independently for channel 1 and 2.

POWER LED: The red POWER LED lights when AC power is applied to the rear panel power jack.

INPUT Controls

BYPASS Button and LED: Press this button In to bypass the front panel controls, effectively canceling the function and processing effect of the 296's enhancement settings. The input signal is still present at the 296's Output, but is now unaltered by the 296's controls. The BYPASS feature is especially useful for making comparisons between processed and unprocessed signals. (Note: the 296 BYPASS is hardwired. It will pass signal even if the unit is not powered.)

The red BYPASS LED lights when BYPASS is active.

GAIN (dB) Control: This control sets the level of the input signal. To add gain, rotate the control clockwise from 0. To attenuate the input signal, rotate the control counterclockwise from 0. Note that the 0 setting (control set to 12 o'clock position) is the nominal, or unity gain setting; in this case, the input is neither boosted or attenuated.

PROCESS Controls

HISS REDUCTION Control and HF CUTOFF LED Meter: Use the HISS REDUCTION control to activate the 296's high frequency filter. For normal operation, adjust this control clockwise from MIN until the audible hiss is reduced or eliminated. The fully counterclockwise setting turns the Hiss Reduction function Off. Note that HISS REDUCTION, when active, is applied to the dry input signal before any "detailing."

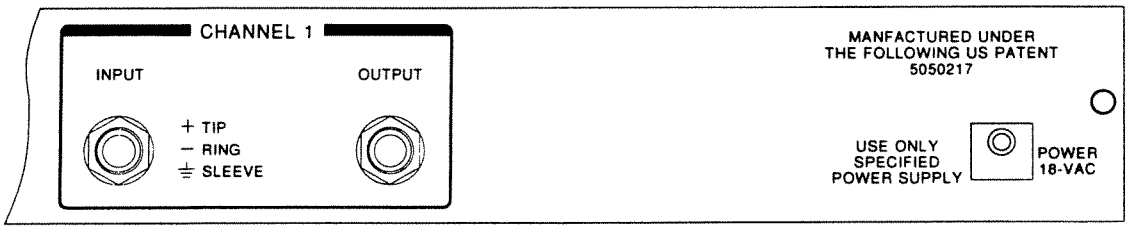
The HF CUTOFF LED meter is a useful guide to setting the HISS REDUCTION control because it shows the bandwidth of the filter at every moment, providing visual verification of the filter's audible effect.

LF DETAIL Control: Use this control to set the amount of low frequency energy that the 296 adds to the input signal. The LF DETAIL control boosts the "bottom end" frequencies (centered around 50Hz) while simultaneously cutting the "muddy" mid-bass frequencies. For most applications requiring LF DETAIL, start with the control at 5 and adjust as necessary. The fully counterclockwise setting turns this section Off.

HF DETAIL Control: Use this control to set the amount of high frequency energy that the 296 adds to the input signal. Continuous analysis of the input signal intelligently and automatically determines the amount of equalization necessary at each moment to achieve detailed, defined audio that is never shrill or over-sibilant. Modest settings (between 4 and 6) go a long way for most applications, and fully clockwise settings will be more than sufficient for almost any application. The fully counterclockwise setting turns the HF DETAIL Off.

CLIP LED: The red CLIP LED lights when the 296's controls are adjusted so that the unit is clipping. If this occurs, your output peaks may be exceeding +20dBu. Turn down one or more of the following 296 controls until the LED stays off: HF DETAIL, LF DETAIL, INPUT GAIN. If clipping is still evident at the 296 output, the input signal to the 296 is too "hot"; turn down the level of the unit driving the 296 (e.g., keyboard, preamp, mixer, etc.).

Rear Panel



INPUT Jacks: Use ¼" phone plugs to connect these inputs to your source. The 296's INPUT jacks accept either balanced or unbalanced signals. Nominal input level is 0dBu and clipping level is +20dBu. Input impedance is 100kΩ.

OUTPUT Jacks: The OUTPUT jacks accept ¼" phone plugs. Nominal output signal level is 0dBu into 600Ω, and typical maximum output signal level is +20dBu into 600Ω. Output impedance is 47Ω. The outputs are single-ended (or unbalanced), Tip Hot.

AC Power Supply Jack Plug the AC Power Supply (shipped with your unit) into this jack and an appropriate AC power source. Note that the 296 does not have a power button. It is recommended that the 296 be "On" at all times. Power consumption is low. If you do not plan to use the 296 for an extended period of time, unplug it.

Warning: Be sure to verify your actual line voltage is the same as the voltage level printed on the power supply. Connection to an inappropriate power source may result in extensive damage which is not covered by the warranty.



OPERATING NOTES

Using the 296

The best way to become familiar with the 296, whether in the studio or live, is to pass audio through it and listen to the effects produced by turning the various controls. Use the table shown below to get you started. Then, experiment with the 296's controls and try different settings. You might be surprised at what you hear. Best of all, you may create the perfect sound for your needs.

Suggested Uses For Each Control

	Voice	Keyboard	Guitar	Bass Guitar	Drums	Strings/ Horns	Bouncing Tracks	Mixing PreReverb	Mixing Post Reverb	Club Sound/ DJ
Hiss Reduction	▶	▶	▶	▶	▷	▷	▷	▷	—	▷
LF Detail	—	▷	▷	▶	▷	▷	—	▶	▶	▶
HF Detail	▶	▷	▶	▷	▷	▶	▶	▶	▶	▶

▶ Recommended; These sound sources can be effectively re-energized and enhanced with treatment. Use to taste.
▷ Program-Dependent; Use when program material requires treatment. Make sure you use only as much treatment as needed.
— Not Recommended. The 296 is generally not applicable for these applications.

Hiss Reduction

Unlike the enhancement "detail" circuitry which enhances a signal and then mixes it back with the main signal at the device's output, the 296's HISS REDUCTION is applied to a signal before it reaches the enhancement circuitry. (Note that the hiss reduction acts upon the entire pre-processed signal.) Therefore, the sound you hear is actually composed of "detailed" signals mixed back together with the main audio path (which may have been hiss reduced).

The Hiss Reduction and HF Detail circuitry "talk" to each other. When the Hiss Reduction is active, the maximum amount of HF Detail that can be added to the signal is reduced.

This circuit is most effective when used in the tracking process. If your overall mix requires hiss reduction, be aware that with some types of reverb, the reverb effect may be diminished. When possible, add reverb after treatment with a 296.

"Detailing" Controls

The HF DETAIL and LF DETAIL controls are "level" controls that "mix" the desired effect into the original program material. Start with both controls set fully counterclockwise to defeat the effect. Advance either control to hear that control's effect.

HF Detail

On mixed program material, the HF DETAIL usually produces the best sound if adjusted in the 4 to 6 range; the detail and definition of the program material is improved, yet the material does not sound excessively shrill. If HF DETAIL processing is applied to single tracks, the control must be set to individual taste. Use your ears, and judge how the processing affects the sound of the track in the context of the entire mix. Generally, if the program material is very bright to begin with, you will hear little effect; if the program material is dull, you will hear very significant brightening. Note that for any HF processing to occur, there must be some high frequency signal content present in the input signal. The 296 also works well in treating final mixes which contain previously treated individual tracks because the unit will only add highs when they are below the threshold determined by the HF DETAIL control setting.

The HF DETAIL processing introduces surprisingly little noise because it intelligently differentiates noise from other program material and does not enhance noise.

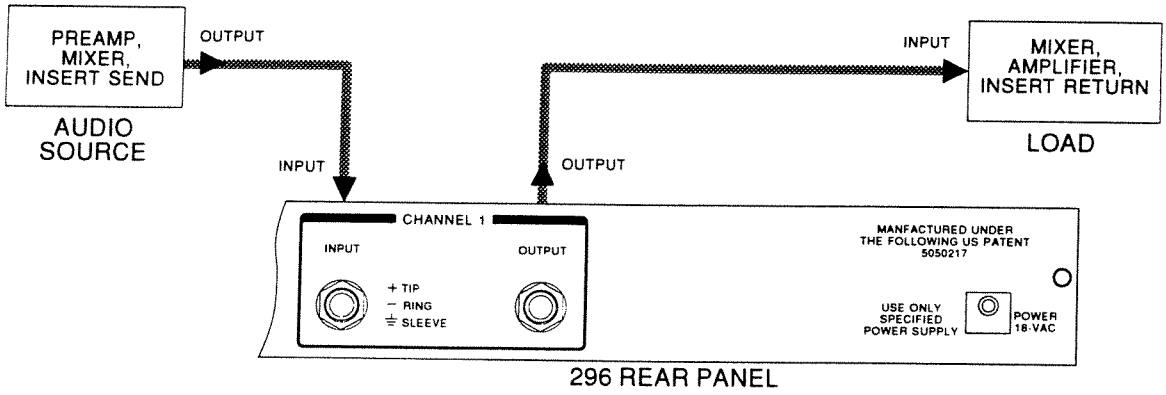
LF Detail

The 296's LF DETAIL is a static EQ that uses a specially derived curve to boost the lower bass frequencies, while cutting mid-bass mud. This "mud" can come from too many bounces on analog multi-track, limited EQ on a mixing console, improper miking techniques, etc. The circuit provides a very different type of effect than the EQ on a typical mixer — enhancing and re-energizing the signal's low end. Don't hesitate to re-adjust the LF DETAIL for different program input or different EQ settings on your mixer. The LF DETAIL can also be used in conjunction with bass enhancement devices (such as a dbx 120XP Subharmonic Synthesizer). Be careful not to exceed your system's maximum level handling capability when using extreme settings.

CONNECTING THE 296 TO YOUR SYSTEM

Basic Connection

The 296 can be used with any line-level device. Some common examples include mixing consoles, electronic musical instruments, patch bays, and signal processors.



296 REAR PANEL

For all connections, refer to the following steps:



1. **Turn Off all equipment before making any connections.**

2. **Mount the 296 in a 1U rack space (Optional).**

   The 296 requires 1 rack space (height) and 1 rack space (width). It can be mounted above or below anything that doesn't generate excessive heat; it requires no special ventilation. Ambient temperatures should not exceed 113°F (45°C) when equipment is powered.

   Note: Avoid over-tightening of rackmounting screws as this could damage the front panel.

   Caution: Never remove the cover. There are no user-serviceable parts inside.

3. **Make connections via ¼" phone jacks according to your requirements.**

   When connecting your 296, consider the following patch points: a mixer's channel or subgroup inserts when using the 296 on individual instruments or tracks; the mixer's main outputs when mixing; main outs of a submixer (i.e., keyboard mixer) as the signal is sent to main mixer; between a DAT's output and an analog cassette input. When using a chain of processors, the 296 may be placed either before or after effects or dynamics processors. We recommend you use common sense and experiment with different setups to see which one provides the best results for your needs. For example, when mixing material while adding reverb, the 296 usually works best when placed

before the reverb.

4. **Connect the AC power supply (shipped with the unit) to the 296's rear panel POWER jack and an appropriate AC power source.**

   Note: Check the line voltage (printed on the power supply) and verify that it is correct.

TECHNICAL SUPPORT, FACTORY SERVICE

Technical Support, Factory Service

The 296 is an all-solid-state product with components chosen for high performance and excellent reliability. Each 296 is tested, burned in and calibrated at the factory and should require no internal adjustment of any type throughout the life of the unit. We recommend that your 296 be returned to the factory only after referring to the manual and consulting with Customer Service.

Our phone number, Fax number and address are listed on the inside front cover. When you contact dbx Customer Service, be prepared to accurately describe the problem. Know the serial number of your unit — this is printed on a sticker attached to the rear panel.

Note: Please refer to the terms of your Limited Two-Year Standard Warranty, which extends to the first end-user. After the warranty expires, a reasonable charge will be made for parts, labor, and packing if you choose to use the factory service facility. In all cases, you are responsible for shipping charges to the factory. dbx will pay return shipping if the unit is still under warranty.

Shipping Instructions: Use the original packing material if it is available. Mark the package with the name of the shipper, and with these words in red: "DELICATE INSTRUMENT, FRAGILE!" Insure the package properly. Ship prepaid, not collect. Do not ship parcel post.

Registration Card and User Feedback

We appreciate your feedback. After you have an opportunity to use your new 296, please complete the Registration Card (located in the back of this manual), detach it from the manual and return it.

SCHEMATICS

Schematics for the 296 are provided in the 296 Service Manual, available from our Customer Service Department for a nominal fee.

SPECIFICATIONS

Note: 0dBu = 0.775Vrms

Specifications are subject to change.

Frequency Response	20Hz - 20kHz, +0dB, −1.0dB 5Hz - 40kHz, +0dB, −3.0dB; Referenced to 1kHz
Input (Balanced or Unbalanced)	
Impedance	100kΩ
Max Level	+20dBu
Gain	Adjustable; −∞ to +14dB
Output	
Impedance	47Ω
Max Level	+20dBu into 600Ω (Unbalanced)
Distortion + Noise	<0.1% (Typically 0.02%) 20Hz - 20kHz, 0dBu Output
Noise	<−80dBu, Unweighted, 20Hz - 20kHz Bandwidth, with Controls 12 o'clock or lower
Dynamic Range	>100dB, Unweighted
Crosstalk	<−90dBu @ 1kHz
Common Mode Rejection	>40dB (Any Frequency)
Controls (per channel)	Input Gain, Hiss Reduction, LF Detail, HF Detail, Bypass
Metering (per channel)	Cutoff Frequency, Clip
Power Requirements	AC provided by external power supply included with unit.
Operating Temperature	0°C to 45°C (32°F to 113°F)
Dimensions (H x D x W)	1.75" x 4" x 19" (4.45cm x 10.16cm x 48.5cm)
Rack Space	1 Rack Unit
Weight	Net Weight: 3 lbs (1.38 kg); Shipping Weight: 5 lbs (2.3 kg)

WARRANTY

United States Warranty

Limited Warranty

This warranty is valid only for the original purchaser and only in the United States. We warrant dbx products against defects in material or workmanship for a period of two years from the date of original purchase for use, and agree to repair or, at our option, replace any defective item, except external power transformers, without charge for either parts or labor.

IMPORTANT: This warranty does not cover damage resulting from accident, misuse or abuse, lack of reasonable care, the affixing of any attachment not provided with the product, loss of parts, or connecting the product to any but the specified receptacles. This warranty is void unless service or repairs are performed by an authorized service center. No responsibility is assumed for any special, incidental or consequential damages. However, the limitation of any right or remedy shall not be effective where such is prohibited or restricted by law.

Simply take or ship your dbx product prepaid to our service department. Be sure to include your sales slip as proof of purchase date. (We will not repair transit damage under the no-charge terms of this warranty.) dbx will pay return shipping.

NOTE: No other warranty, written or oral is authorized for dbx products.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Some states do not allow the exclusion of limitations of incidental or consequential damages or limitations on how long an implied warranty lasts, so the above exclusion and limitations may not apply to you.

International Warranty

Bedingungen

dbx gewährt 2 jahre Garantie ab Verkaufsdatum auf nachweisbare Material- und Fabrikationsfehler (ausgenommen externe Netzgeräte). Der Garantieanspruch erlischt bei unsachgemäßer Handhabung, elecktrischer oder mechanischer Beschhädigung durch mißbräuchliche Anwendung sowie bei unsachgemäßer Reparatur durch nichtautorisierte Werkstätten. Zur Inanspruchnahme der angefürten Garantieleistung ist der Nachweis da Kaufes (ordentliche Rechnung da Verkäufers erforderlich). Transport-und Portospesen, welche aus der Einsendung des Gerätes zur Garantiereparatur erwachsen, können von dbx nicht übernommen werden, das Risiko der Zusendung trägt der Kunde. Die Garantie wird ausschließblich für den ursprünglichen Käufer geleistet.

Warranty Conditions

dbx warrants dbx products (except for external power transformers) against evident defects in material and workmanship for a period of two years from the date of original purchase for use. This warranty does not cover damage resulting from misuse or abuse, or lack of reasonable care, and inadequate repairs performed by unauthorized service centers. Performance of repairs or replacements under this warranty is subject to proof of purchase. Shipment of the defective item for repair under this warranty will be at the customer's own risk and expense. This warranty is valid for the original purchaser only.

Conditions de garantie

Pour toute mise en œvre de garantie ou de service après-vente, vous devez vous adresser à votre revendeur. Notre société assure au revendeur le remplacement gratuit des pièces détachées nécessaires à la réparation pendant deux ans, à partir de la date de votre facture, sauf en cas de non respect des prescritions d'utilsation ou lorsqu' une cause étrangère à l'appareil est responsable de la défaillance. Cette guarantie n'est pas applique pour les transformers external. Les dispositions stipulées cidessus ne sont pas exclusives du bénéfice au profit de l'acheteur de la garantie légale pour défaut et vice cachés qui s'applique, en tout état de cause, dans les conditions des articles 1641 et suivants du Code Civil.

Condizioni di garanzia

L'dbx presta garanzia per due anni dalla data della vendita per difetti di materiale e fabbriccazione che possono essere provati. Il diritto di garanzia cessa in caso di manipolazione impropria, danneggiamento electtrico o meccanico attraverso i'uso non approriato e riparazione inesperta eseguita da officine non autorizzate. E' indispensabile, per la prestazione della garanzia, presentare la carta di garanzia debitamente riempita dal rivenditore autorizzato e la fattura di vendita. Spese di trasporto che risultano dall'invio dell'implanto per la riparazione in garanzia, non possono essere assunte dall'dbx i'invio è a rischio e pericolo del cliente. La garanzia verrà data solo al primo acquirente.

Condiciones de garantia

dbx concede dos años de garantia (menos fuentes de poder exteriores) por defectos comprobables de material o de fabricación a partir de la fecha de venta. El derecho de garantia caduca en caso de procederse a uno manipulación inadecuada en caso de producirse daño electrico o mecánico por uso indebido, así como también en caso de reparaciones inadecuados por parte de talleres no autorizados. La prestación de la garantia está sujeta a la presentación de la factura de compra. dbx no asume ningún gasto de transporte o correo incurrido por el envio del aparato defectuoso para la reparación bajo garantia; el riesgo del envio ha de ser asumido por el cliente. La garantia se concede única y exclusivamente al comprador original.