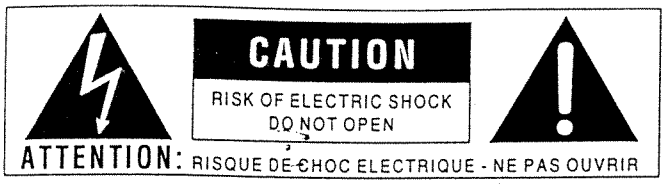
MODEL 1086

dbx®

H A Harman International Company

OPERATION MANUAL



WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE

The symbols shown above are internationally accepted symbols that warn of potential hazards with electrical products. The lightning flash with arrowpoint in an equilateral triangle means that there are dangerous voltages present within the unit. The exclamation point in an equilateral triangle indicates that it is necessary for the user to refer to the owner's manual.

These symbols warn that there are no user serviceable parts inside the unit. Do not open the unit. Do not attempt to service the unit yourself. Refer all servicing to qualified personnel. Opening the chassis for any reason will void the manufacturer's warranty. Do not get the unit wet. If liquid is spilled on the unit, shut it off immediately and take it to a dealer for service. Disconnect the unit during storms to prevent damage.

WARNING

FOR YOUR PROTECTION, PLEASE READ THE FOLLOWING:

WATER AND MOISTURE: Appliance should not be used near water (e.g. near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, etc). Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.

POWER SOURCES: The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.

GROUNDING OR POLARIZATION: Precautions should be taken so that the grounding or polarization means of an appliance is not defeated.

POWER CORD PROTECTION: Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.

SERVICING: To reduce the risk of fire or electric shock, the user should not attempt to service the appliance beyond that described in the operating instructions. All other servicing should be referred to qualified service personnel.

FOR UNITS EQUIPPED WITH EXTERNALLY ACCESSIBLE FUSE RECEPTACLE: Replace fuse with same type and rating only.

U.K. MAINS PLUG WARNING

A moulded mains plug that has been cut off from the cord is unsafe. Discard the mains plug at a suitable disposal facility. **NEVER UNDER ANY CIRCUMSTANCES SHOULD YOU INSERT A DAMAGED OR CUT MAINS PLUG INTO A 13 AMP POWER SOCKET.** Do not use the mains plug without the fuse cover in place. Replacement fuse covers can be obtained from your local retailer. Replacement fuses are 13 amps and MUST be ASTA approved to BS1362.

ELECTROMAGNETIC COMPATIBILITY

Operation is subject to the following conditions:

- this device may not cause harmful interference, and
- this device must accept any interference received, including interference that may cause undesired operation.
- use only shielded interconnecting cables.
- operation of this unit within significant electromagnetic fields should be avoided.

SAFETY INSTRUCTIONS

NOTICE FOR CUSTOMERS IF YOUR UNIT IS EQUIPPED WITH A POWER CORD.

WARNING: THIS APPLIANCE MUST BE EARTHED.

The cores in the mains lead are coloured in accordance with the following code:

GREEN and YELLOW - Earth BLUE - Neutral BROWN - Live

As colours of the cores in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

- The core which is coloured green and yellow must be connected to the terminal in the plug marked with the letter E, or with the earth symbol, or coloured green, or green and yellow.
- The core which is coloured blue must be connected to the terminal marked N or coloured black.
- The core which is coloured brown must be connected to the terminal marked L or coloured red.

This equipment may require the use of a different line cord, attachment plug, or both, depending on the available power source at installation. If the attachment plug needs to be changed, refer servicing to qualified service personnel who should refer to the table below. The green/yellow wire shall be connected directly to the unit's chassis.

CONDUCTOR		WIRE COLOR	
L	Line	Brown	Black
N	Neutral	Blue	White
⏚	Earth Grnd.	Green/Yel.	Green

WARNING: If the ground is defeated, certain fault conditions in the unit or in the system to which it is connected can result in full line voltage between chassis and earth ground. Severe injury or death can then result if the chassis and earth ground are touched simultaneously.

DECLARATION OF CONFORMITY

Manufacturer's Name: dbx Professional Products
Manufacturer's Address: 8760 S. Sandy Parkway
Sandy, Utah 84070, USA

declares that the product:

dbx 1086

conforms to the following Product Specifications:

Safety: EN 60065 (1993)
IEC65 (1985) with Amendments 1, 2, 3

EMC: EN 55013 (1990)
EN 55020 (1991)

Supplementary Information:
The product herewith complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 90/336/EEC as amended by Directive 93/68/EEC.

dbx Professional Products
Vice-President of Engineering
8760 S. Sandy Parkway
Sandy, Utah 84070, USA
August 10, 1997

European Contact: Your Local dbx Sales and Service Office or
International Sales Office
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dbx

Manual Contents

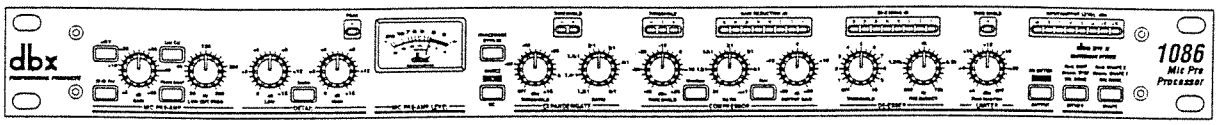
Introduction

Congratulations and thank you for your purchase of the dbx 1086. The 1086 is a single channel microphone pre-amp and dynamics processor with an optional dbx Type IV™ digital output. The 1086 incorporates the new advanced dbx V2™ VCA for high system performance.

The 1086's mic pre-amp and dynamics processor can be combined or accessed independently. The mic pre-amp section is the left hand section of the 1086 as you face the front panel. The mic pre-amp and the dynamics processor sections are separated by the mic pre-amp VU meter.

The Dither and Shape switches on the far right-hand side of the 1086 are not enabled unless the optional dbx TYPE IV™ Conversion System has been installed. Documentation will be included with the dbx TYPE IV™ conversion kit.

We recommend that you take a moment to read through this operation manual. It provides valuable information that will assist you in setting up and operating your 1086.



Inspection

Verify that the 1086's package contains the following:

- 1086 Unit (according to Model number marked on package)
- AC Power Cord
- Operation Manual
- Registration Card
- Rack screws

If any of these items are missing, contact dbx customer service at (801) 568-7660.

Warranty

This warranty is valid only for the original purchaser and only in the United States. We warrant dbx products against defects in materials 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 an 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.

Connecting the 1086 to your system

To connect the 1086 to your system, refer to the following steps:

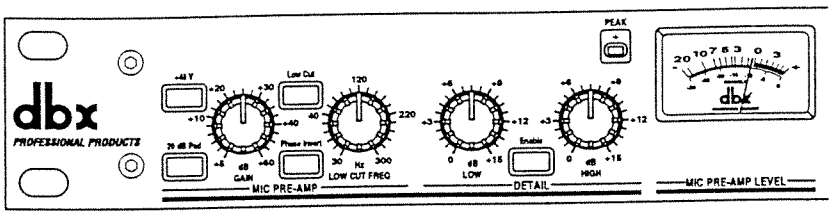
- Turn off all equipment before making any connections.
- Mount the 1086 in a rack
- Install the 1086 in a rack with the rack screws provided

It can be mounted above or below anything that does not generate excessive heat. Ambient temperatures should not exceed 113°F (45°C) when equipment is in use. Although the unit is shielded against radio frequency and electromagnetic interference, extremely high fields of RF and EMI should be avoided where possible.

- Make audio connections via XLR, 1/4" TRS, or 1/4" TS plugs.
- Both types of connectors for the inputs and outputs can be used for balanced or unbalanced connections. The use of more than one connector at a time for the input/output pair could unbalance balanced lines, cause phase cancellations, short a conductor to ground, or cause damage to other equipment connected to the 1086.
- Verify that the fuses installed in the pull-out drawer of the fuse receptacle match the type and rating corresponding to the voltage in use as indicated on the rear panel of the 1086. Note that one fuse is active while the other fuse is a spare.
- Apply power to the 1086. Connect the AC power cord to the AC power receptacle on the back of the unit. Route the AC power cord to a convenient power outlet away from audio lines. The unit may be turned on and off from the rear panel power switch or from a master equipment power switch.

Operating Controls

Front Panel - Pre-Amp Controls



+48V Phantom Power switch This switch activates phantom power for condenser microphones on pins 2 and 3 of the XLR mic input. You should connect your microphone before turning on the phantom power to prevent high voltage arcing that may damage your mic.

20 dB Pad switch This switch inserts a 20 dB attenuator circuit into the signal path from the microphone input. The pad is inserted before the signal is routed through the mic pre gain stage. Use the 20 dB Pad to attenuate signals from "hot" sources such as high-output microphones.

Gain control This control determines the amount of gain that will be applied to the input signal. There is up to 60 dB of gain available to amplify even the weakest of microphone signals.

Low Cut switch This switch places a 12 dB per octave shelving high pass filter in the signal path. The frequency of the Low Cut filter is variable from 30 to 300 Hz. This feature is very useful for removing low frequency rumble or handling noise from a microphone input signal. It is also good for reducing the very low frequency components of signals that can damage speakers or sap amplifier power unnecessarily.

Low Cut Freq control This control varies the frequency of the low cut filter from 30 to 300 Hz.

Detail switch This switch enables a two-band tone shaping circuit for altering and enhancing the frequency response of the microphone pre-amp. The Low control is a two-stage circuit allowing simultaneous boost and cut of selected frequencies. The High control is an "air band" type shelving high pass filter.

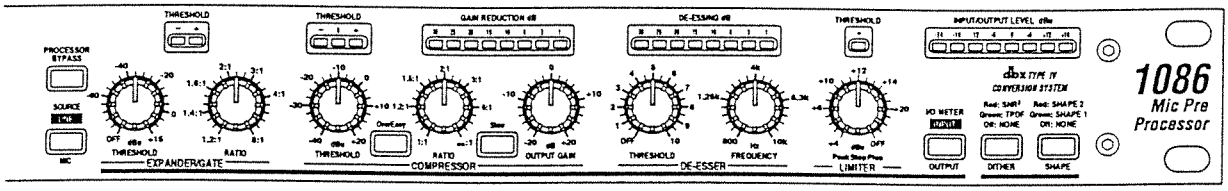
Low control This control varies the amount of low detail from 0 to +15 dB. At the maximum boost position (+15 dB), the two-stage filter provides 15 dB of boost at 125 Hz, while simultaneously providing 7.5 dB of cut at 400 Hz. This allows for adding warmth to the bottom end, without adding undesirable boost in the "honky" lower mid frequency range.

High control This control varies the amount of high detail from 0 to +15 dB. The high detail circuit is a high frequency shelving filter at 10 kHz. This control allows for sweetening of the high frequencies and helps to enhance the intelligibility of a vocal performance.

Peak LED This red LED illuminates when the microphone pre-amp level is within 3 dB of clipping.

Mic Pre-Amp Level (VU meter) The VU meter monitors the output level of the mic pre-amp section, where the output range displayed varies from -30 to +6 dB. With the mic pre-amp's rear-panel +4 dBu/-10 dBV switch in the +4 dBu position, 0 dB (0 VU) on the meter corresponds to a microphone pre-amp output level of +4 dBu; with the +4 dBu/-10 dBV switch in the -10 dBV position, 0 dB (0 VU) on the meter corresponds to a microphone pre-amp output level of -10 dBV.

Front Panel - Dynamics Processor Controls



Processor Bypass This switch bypasses the dynamics processor section. When Bypass is depressed, the V2™ VCA is removed from the signal path and the processor's input signal is routed directly to the output, i.e. all dynamics processing functions are disabled.

Line/Mic Switch This switch enables the user to select the input source for the dynamics processor. In the Mic position, the output of the microphone pre-amp is selected as input; in the Line position, the signal at the dynamics processor line input is selected. Using the Line position allows you to effectively separate the microphone pre-amp from the dynamics processor and use the two functions independently.

Expander/Gate Threshold Control This control sets the level below which gating/expansion occurs. It has an effective control range of -60 dB to +15 dB. When it is fully counter clockwise to the "off" position, no gating or expansion occurs.

Expander/Gate Threshold Below (-) LED This LED illuminates when the signal is below the level set by the EXPANDER/GATE THRESHOLD control and indicates that expansion or gating is occurring.

Expander/Gate Threshold Above (+) LED This LED illuminates when the signal is above the level set by the EXPANDER/GATE THRESHOLD control and indicates that no expansion or gating is occurring.

Expander/Gate Ratio Control This control sets the expansion ratio and varies from 1:1 to 8:1. It is important to note that as the signal passes below the threshold, the input/output gain relationship does not transition sharply from unity gain (where no expansion is occurring) to the ratio set by the EXPANDER RATIO control. The 1086's expander utilizes a soft-knee OverEasy® threshold circuit analogous to the OverEasy® compressor curve made famous by the 1086's predecessors and employed in the compressor section of the 1086. See *Figure 1.* This soft knee contributes to the smooth and natural sounding decay of the 1086 expander making its action virtually transparent with low to moderate ratio settings. When hard gating is required, higher ratio settings cause the expander to function like a gate. The expander attack and release times are program-dependent. The detector intelligently senses the need for fast attack for rapidly-changing signals, and slows down for more stable signals.

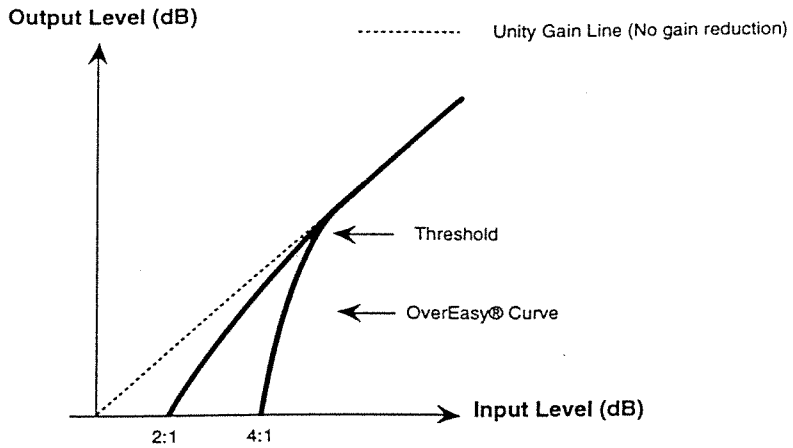


Figure 1: Expander/Gate OverEasy® Threshold Characteristic

Compressor Threshold Control This control sets the level above which compression occurs, and has a 60 dB range, from -40 dBu to +20 dBu.

Compressor Threshold Below (-) LED This LED illuminates when the signal is below the level set by the COMPRESSOR THRESHOLD control. This indicates that the compressor is not compressing and is operating in its linear region.

Compressor Threshold OverEasy® (O) LED This LED illuminates when the signal is in the OverEasy® portion of the compression curve. In this region the ratio varies as a function of signal level between 1:1 and the ratio set by the RATIO control. This LED is defeated when the OverEasy® function is disabled.

Compressor Threshold Above (+) LED This LED illuminates when the signal is above the OverEasy® portion of the compression curve and indicates that the full value set by the RATIO control has been reached. If OverEasy® is disabled, this LED indicates the signal is above the level set by the COMPRESSOR THRESHOLD control and dynamic range compression is occurring.

OverEasy® Switch OverEasy® provides a smooth transition from the compressor's linear region to the compressed region. This smooth transition greatly reduces compression artifacts and allows faster attack times and higher compression ratios while still maintaining the natural characteristics of the signal. The switch lights to indicate OverEasy® processing is enabled. When conventional hard knee processing is desired, disable the OverEasy® function. See *Figure 2*

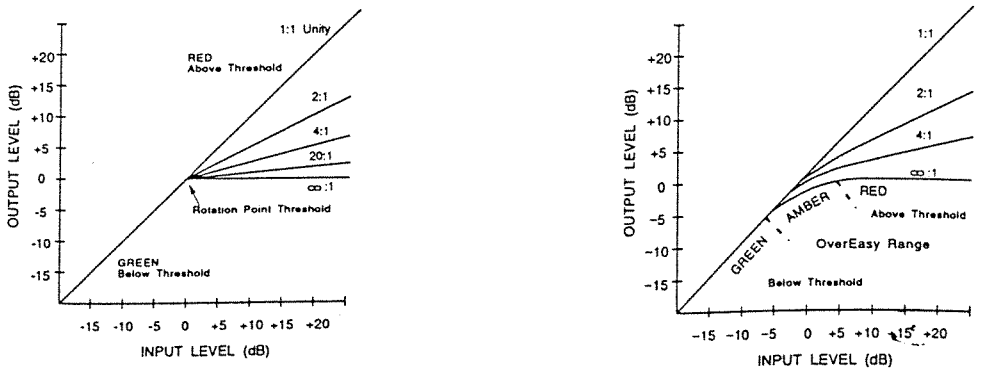


Figure 2: Hard Knee Compression Curve,and OverEasy® Compression Curve, and Threshold LEDs.

Figure 3 shows the effect of 2:1 compression on a signal as it rises above and falls below the threshold. Below the threshold the signal is not affected. Above the threshold, the output signal increases by only half of the increase (in dB) of the input signal level. In other words, with a 2 dB increase in input level, the output increases by only 1 dB, hence the 2:1 compression ratio.

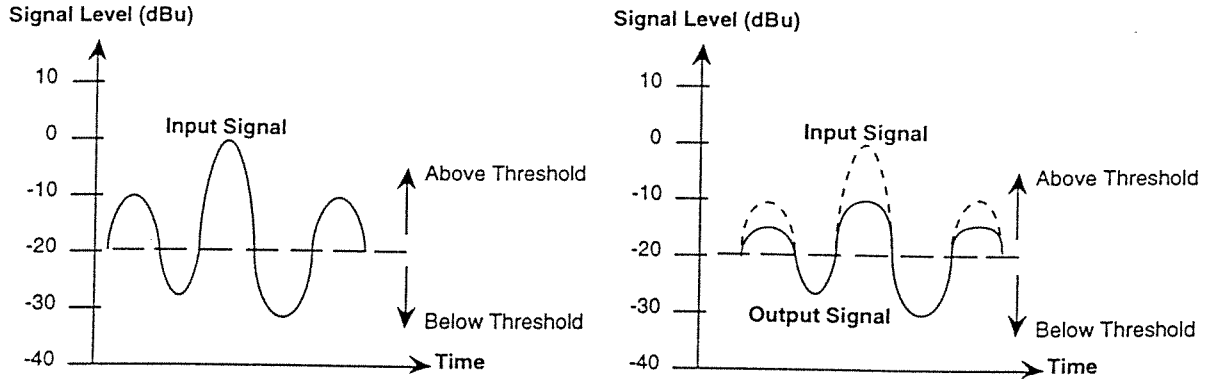


Figure 3: Compression Effect on Signal Level with a 2:1 Ratio at a -20 dBu Threshold

Compressor Ratio Control This control selects the ratio between input and the output levels for signals above the level set by the COMPRESSION THRESHOLD control. It is adjustable between 1:1 and infinity:1 (∞:1). Note, when OverEasy® processing is selected, the ratio transitions smoothly from the linear to the compressed region. As the signal exceeds the threshold, the ratio approaches the ratio set by the COMPRESSOR RATIO control.

Gain Reduction Meter This 8 stage meter shows the amount of gain reduction due to compression, expansion/gating, or Intelligent Predictive Limiting™, displaying gain reduction from 1 to 30 dB.

Slow (compressor timing) Switch This switch enables the slow auto timing circuit for the compressor's RMS detector. With the Slow switch in the normal (out) position, the 1086's auto (program-dependent) compressor timing exactly duplicates the classic dbx 160A compressor/limiter, the preferred choice of many recording engineers for processing vocal performances. When the Slow switch is depressed, the RMS detector attack and release time constants are increased (i.e., slowed down), to allow for better processing of instrument inputs, such as guitar, bass guitar or keyboards. Experimentation with different combinations of input signals, compressor timing and compressor ratios can yield interesting results.

Output Gain Control This control sets the output gain of the compressor. It can be continuously adjusted between -20 dB and +20 dB. Use this control to compensate for signal level loss due to compression and to adjust the nominal output level of the unit.

De-Esser Threshold Control Use this control to set the sensitivity of the De-Esser to high frequency content present in the signal at the 1086's input. The De-Esser tracks the input level so the amount of de-essing remains constant with changes in input level. De-essing is useful for removing excessive sibilance or high frequency content from a vocal or instrumental performance. De-essing is best used sparingly, since large amounts can cause "lisping" in a vocal performance, or significantly "darken" an instrumental track. A rule-of-thumb is to increase the De-esser Threshold control to the point the de-essing action is obvious, then back the control off a bit for normal operation. If no de-essing is desired, turn the De-esser Threshold control to the "off" position.

De-Esser Frequency Control This control is used to set the frequency of the variable high pass filter used in the De-Esser detection circuitry. Settings between 4 - 8 kHz will yield the best results for vocal processing, while 800 - 4 kHz settings will work well for non-vocal applications.

De-Essing Meter This 8-stage meter displays the amount of de-essing, from 1 to 30 dB.

PeakStopPlus™ Threshold Control This control sets the level to which the output signal is reduced whenever it exceeds this level. It can be adjusted between +4 dBu and +22 dBu (OFF). This PeakStopPlus™ limiter uses a dbx two-stage limiting process. The first stage is the Instantaneous Transient Clamp™ which clamps the signal with a soft logarithmic clamp function. This logarithmic function assures that the signal will not exceed the level set by the PeakStopPlus™ LEVEL control by more than 2 dB typically, and that it will not introduce harsh artifacts. The second stage is a unique program limiter featuring Intelligent Predictive Limiting™. Its function is to monitor the input signal and intelligently predict the amount of gain reduction needed to keep the output signal below the ceiling set by the Instantaneous Transient Clamp™. Note, since the PeakStopPlus™ limiter is a fail-safe limiter it must come after the OUTPUT GAIN control. If the OUTPUT GAIN is set too high as compared to the PeakStopPlus™ LEVEL control, continuous limiting can occur. While PeakStopPlus™ is typically used as a protective function, creative effects can be achieved by intentionally driving the signal into heavy PeakStopPlus™ limiting. Great care has gone into the design of the PeakStopPlus™ limiter to keep it acoustically transparent. Appropriate use of it can protect your gear while keeping the signal free of artifacts. PeakStopPlus™ also serves to prevent digital overload when used in conjunction with the dbx Type IV™ Conversion System.

PeakStopPlus™ Threshold (+) LED Indicator This LED illuminates when the output signal exceeds the level set by the PeakStopPlus™ LEVEL control indicating that PeakStopPlus™ limiting is occurring.

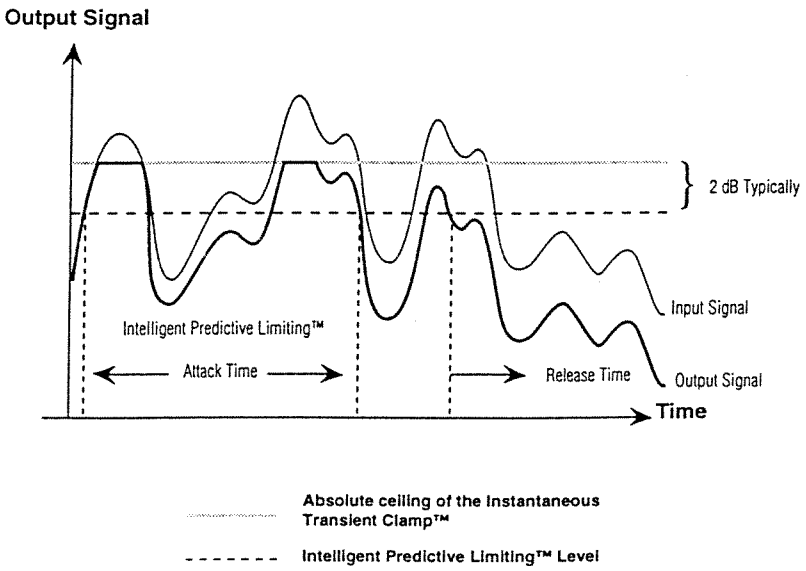


Figure 4: Protective Action of the PeakStopPlus™ Limiter

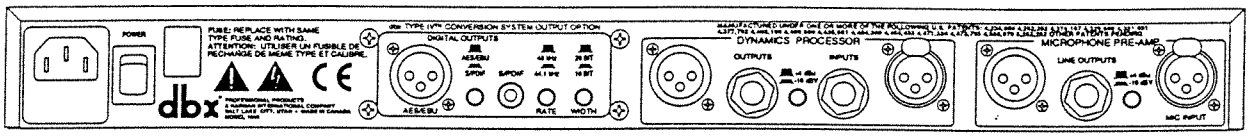
Figure 4 illustrates the protective action of the PeakStopPlus™ limiter. The signal with the thin line weight represents an unaltered input signal. As you can see, peaks of the input signal exceed the clamping level. The signal with the heavier line weight represents the output signal. The peaks of the input signal which exceeded the clamping level are not allowed to exceed this level at the output. This instantaneous protective action is invaluable for driver protection in speaker systems and for digital recording where it is desirable to record as "hot" as possible, while still avoiding the disastrous result of running out of headroom. Following this clamping action, Intelligent Predictive Limiting™ takes over, typically within 5 ms, as long as the input signal continues to exceed the PeakStopPlus™ threshold. This program limiter quickly attenuates the input signal to a level safely below the clamping level, typically 2 dB lower than the clamp-

ing level. The PeakStopPlus™ level control is calibrated to this lower level, so if an absolute ceiling is required, set the level 2 to 3 dB below the front panel setting.

As implied by the name, the attack and release times of the Instantaneous Transient Clamp™ are zero, while the Intelligent Predictive Limiting™ attack and release times are program-dependent. That is, for larger excursions over the threshold, the attack time speeds up, and for smaller excursions over the threshold, the attack time slows down. Similarly, for large excursions over the threshold which cause more PeakStopPlus™ gain reduction, the release time increases and is roughly proportional to the amount of gain reduction that occurred.

So, as you can see, dbx's exclusive PeakStopPlus™ is a technically advanced and superior limiting scheme for unrivaled system protection as well as digital overload protection.

Rear Panel



Microphone Pre-Amp Input The microphone preamp features an electronically balanced XLR input. The microphone input may be used in a balanced or unbalanced configuration.

Mic Pre-Amp Output Operating Level Switch This switch selects between a -10 dBV and +4 dBu nominal operating level for the outputs of the mic pre-amp. When the switch is in the in position, a -10 dBV operating level is selected. When it is in the out position, +4 dBu is selected.

Microphone Pre-Amp Outputs The microphone pre-amp features both XLR and 1/4" TRS servo-balanced outputs. Outputs may be used in a balanced or unbalanced configuration. An optional dbx output transformer is available; contact your dbx dealer for details.

Dynamics Processor Inputs The dynamics processor features both XLR and 1/4" TRS electronically balanced inputs. Inputs may be used in a balanced or unbalanced configuration.

Dynamics Processor Operating Level Switch This switch simultaneously selects between a -10 dBV and +4 dBu nominal operating level for both inputs and outputs of the dynamics processor. When the switch is in the in position, a -10 dBV operating level is selected. When it is in the out position, +4 dBu is selected.

Dynamics Processor Outputs The dynamics processor features both XLR and 1/4" TRS servo-balanced outputs. Outputs may be used in a balanced or unbalanced configuration. An optional dbx output transformer is available; contact your dbx dealer for details.

Power Switch On/Off

AC Power Receptacle Use the supplied AC cable to connect the unit to AC power. The AC receptacle includes an integral pull-out fuse drawer which contains two fuses: the active fuse and a spare fuse. Replace the fuse with the same type and rating only.

1086 Microphone Pre-amp Setup

The 1086's Mic Preamplification Section includes support for phantom-powered mics, a highpass filter, and an input gain control. Note that these controls are applied to the input signal before the signal is processed by the 1086's Processing Section.

Phantom power is available at the push of a button, providing +48VDC to phantom-powered microphones. The 1086's phantom power is sufficient for most microphones, However, some vintage condenser mics may require a separate power source.

For the microphone channel, use the mic gain control to set the level of gain added to the microphone input signal, thereby defining the 1086's output level. Try to set the GAIN control so that you do not have to reset it repeatedly; allow headroom. The 1086's Mic Preamp delivers up to 60dB of sonically transparent gain to reveal the detail and audio signature of even the most esoteric mics.

The red PEAK LED indicates that the combination of the mic signal and additional gain is approaching the limits of the circuits' capabilities and lights when the signal level is 3dB below the clip point. If audible clipping occurs, reduce the gain via the GAIN control. Set the GAIN control so that the CLIP LED flashes only on the loudest peaks.

Applications - Dynamics Processor

Fattening Kick Drums and Compressing other drums
Weak, flabby kick drums often have too much boom, and not enough slap. To tighten them up, start with the 1086 adjusted for a medium to high RATIO (e.g., 6:1), adjust the THRESHOLD control so that the GAIN REDUCTION meter shows 15 dB of gain reduction, then increase the RATIO if necessary. In OverEasy mode, the 1086 takes slightly longer to react than in Hard Knee mode, and will therefore emphasize the slap at the beginning of the note and reduce the boominess of its body. The 1086 also works well for tightening snare drums and tom toms and can be used with drum machines to effectively alter the character of any electronic drum sound.

Raising a Signal Out of a Mix
Since reducing dynamic range increases the average signal level by a small amount, a single track can be raised out of a mix by boosting its level slightly and applying compression. Start with a 2:1 RATIO and a relatively low THRESHOLD setting (-20 dB). Adjust both controls as necessary.

Compressors have also been used to bring vocals to the forefront of a mix in volume-restricted studios (e.g. home studios). Start by adding a foam windscreen to the mic (if it doesn't have one). Set the RATIO to 10:1 and the THRESHOLD to -10 dB. With your mouth approximately 2 inches from the mic, sing the vocal part, but with less volume than normal. Use phrasing to give the part some intensity. An equalizer (e.g., a dbx 242 Parametric Equalizer, dbx 20 or 30 Series Graphic Equalizers) or a vocal effects device (e.g., reverb, delay, distortion) can be added to further define the performance.

Note: When compressing a program with a 1086, the factors affecting a compression curve and the actual RATIO and THRESHOLD settings, are the same as those previously covered with reference to single channels of program material. However, it will generally be found that large amounts of

compression are more audible in a mixed stereo program than they might be on the separate tracks that were mixed to create the program.

Smoothing out microphone levels
When distance is created between the vocalist and the microphone there will be a variation in the signal level. Start with low compression (around 2:1) to smooth out any variations. Limiting also benefits intelligibility by allowing low-level input signals to be reproduced through the system at higher volume.

Smoothing out musical instrument levels
Compression smoothes out the variations of loudness among instruments. Using the 1086 can also increase the instrument's sustain. Compress the instrument's output with a ratio of about 4:1.

Preventing analog tape saturation
With programs of widely varying levels, compression can prevent recording levels from saturating tape tracks (see Frequency-weighted compression, page 12). Also, the 1086's PeakStopPlus™ is particularly useful for this application.

Speaker protection
Compressors are frequently used to prevent excessive program levels from distorting power amps and/or damaging drivers in a sound-reinforcement system (whether you're doing auditorium, church, or club sound engineering, or are a mobile DJ, or like to push the limits of your home's audio entertainment center). Set the 1086 for limiting (Hard Knee mode On, with a RATIO of 10:1 or greater) and adjust the THRESHOLD to provide 15 dB or more of compression (just a few dB below the input clip). For low-level signals, the 1086 won't change gain, but if large signals come along, the gain will be reduced to prevent clipping and save sensitive system components from excessive heat buildup or other type of damage.

Note: PeakStopPlus™ Limiting can also be used to prevent speaker damage.

Preventing digital recording overload
Some digital recorders and samplers produce audible distortion when they exceed their headroom (i.e., the range above their maximum operating level). The 1086 effectively ensures that audio input does not overload a digital recorder's A/D (analog-to-digital) converters. The 1086 can perform this function quietly enough for all digital media. To use the 1086 so that no changes in gain occur unless an emergency arises (wildly excessive levels), set Hard Knee mode On, the RATIO to ∞:1, and the THRESHOLD to the highest permissible level.

Note: PeakStopPlus™ limiting can also be used to prevent digital overload.

Gating Dry Percussive Sounds (e.g., Snare Drum, Kick Drum)
To effectively gate percussive sounds with a high level transient, you need to set the 1086's gate controls to ensure that the gate is less sensitive to nearby signals that would cause the gate to open or "false trigger."

Set the Expander/Gate ratio setting high enough to enable the gate to close abruptly as the signal decays below the THRESHOLD.

Note: Fast expansion of sustained low frequency signals can result in "chattering." Because the 1086 is capable of extremely fast expansion, make sure the ratio is not set too high in these applications. The proper THRESHOLD setting will also minimize false triggering and "chattering."

These types of settings are most useful for tightening up drum tracks, removing the "ring" from some

drums, or gating out the leakage of one drum through another's mic.

Gating Sounds That Have Longer Decay (e.g., Cymbal, Piano)
To effectively gate sounds which have more decay after the initial transient, set the RATIO control low enough to allow the gate to remain open and capture the signal's entire envelope.

Changing Sound Quality
The 1086's expander/gate can effectively change the sonic character of a sound because it can reduce or otherwise alter the quality of instrumental ambience and reverb. For example, as an instrument stops, its reverberation level will fall through the 1086's THRESHOLD setting. It can now be made to die out more quickly - faster than the natural delay (of the sound). Experiment with different THRESHOLD and RATIO settings to change the "tail" of the sound; a HIGH RATIO setting will nearly eliminate reverb.

Installation Considerations

Hookups and Cabling: The 1086 is designed for nominal -10 dBV or +4 dBu levels. The 1086 can be used with either balanced or unbalanced sources and the outputs can be used with either balanced or unbalanced loads, provided the proper cabling is used.

A balanced line is defined as two-conductor shielded cable with the two center conductors carrying the same signal but of opposite polarity when referenced to ground. An unbalanced line is generally a single-conductor shielded cable with the center conductor carrying the signal and the shield at ground potential.

Normal Balanced Connections for Inputs and Outputs

Connection	XLR	TRS 1/4" Jack
Ground:	Pin 1	Sleeve
High:	Pin 2	Tip
Low:	Pin 3	Ring

Normal Unbalanced Connections for Inputs and Outputs

Connection	XLR	TRS 1/4" Jack	TS 1/4" Jack
Ground:	Pin 1	Sleeve	Sleeve
High:	Pin 2	Tip	Tip
Low (ground):	Pin 3	Ring	Sleeve

Tie pin 3 to the ground for unity gain in/out of the 1086 when using unbalanced output connections to balanced input connections or balanced output connections to unbalanced input connections. To do otherwise won't hurt the unit but will result in unmatched input to output levels, and the level control will not be properly calibrated.

Specifications

Mic Pre Input

Connector:	Female XLR (Pin 2 hot)
Type:	Extended headroom instrumentation amplifier Electronically balanced/unbalanced, RF filtered
Impedance:	1.7 kOhm
Max Input Level:	> +34 dBu balanced or unbalanced (Pad in) > +16 dBu balanced or unbalanced (Pad out)
CMRR:	> 40 dB at 1 kHz, typically > 55 dB

Mic Pre Outputs

Connectors:	Male XLR and 1/4" TRS (Pin 2 and tip hot)
Type:	Servo-balanced/unbalanced, RF filtered
Impedance:	Balanced 120 Ohm, unbalanced 60 Ohm
Max Output Level:	> +21 dBu, > +20 dBm (into 600 Ohms) balanced/unbalanced
Nominal Output Level:	-10 dBV or +4 dBu, switchable on rear panel

Dynamics Processor Inputs

Connectors:	Female XLR and 1/4" TRS (Pin 2 and tip hot)
Type:	Electronically balanced/unbalanced, RF filtered
Impedance:	Balanced > 50 kOhm, unbalanced > 25 kOhm
Max Input Level:	> +24 dBu balanced or unbalanced
Nominal Input Level:	-10 dBV or +4 dBu, switchable on rear panel
CMRR:	> 40 dB at 1 kHz, typically > 55 dB

Dynamics Processor Outputs

Connectors:	Male XLR and 1/4" TRS (Pin 2 and tip hot)
Type:	Servo-balanced/unbalanced, RF filtered
Impedance:	Balanced 120 Ohm, unbalanced 60 Ohm
Max Output Level:	> +21 dBu, > +20 dBm (into 600 Ohms) balanced/unbalanced
Nominal Output Level:	-10 dBV or +4 dBu, switchable on rear panel

Mic Pre System Performance

Equivalent Input Noise (EIN):	-122.0 dBu typical, 22 kHz measurement bandwidth, unweighted
Bandwidth, unweighted:	+0/-0.5 dB, <10 Hz to >100 kHz
Frequency Response:	+0/-3 dB, <5 Hz to >250 kHz
THD+Noise:	0.005% typical, 150 Ohm source, 30 dB gain, 1 kHz

Dynamics Processor System Performance

Bandwidth:	+0/-0.5 dB, <10 Hz to >75 kHz
Frequency Response:	+0/-3 dB, <5 Hz to >180 kHz
Noise:	< -92 dBu, unweighted, 22 kHz measurement bandwidth
Dynamic Range:	116 dB typical
THD+Noise:	0.009% typical at +4 dBu, 1 kHz, unity gain
	0.05% typical at +20 dBu, 1 kHz, unity gain
	< 0.1 %, any amount of compression up to 30 dB, 1 kHz
IMD:	< 0.1 % SMPTE, any amount of compression up to 30 dB
VCA:	dbx V2™

Mic Pre Functions

Gain Control:	+5 to +60 dB gain
Phantom Power:	+48V DC, front panel switch
Pad:	20 dB, front panel switch
Phase Invert:	Front panel switch
Low Cut:	30 Hz to 300 Hz, front panel switch
Low Detail:	0 to +15 dB boost
	Simultaneous 125 Hz boost and 400 Hz cut at a 2:1 ratio
High Detail:	0 to +15 dB boost
	High shelving at 10 kHz
Low and High Detail:	Bypassable, front panel switch
Level Indicators:	Backlit VU meter indicating Mic Pre output level
	Peak LED 3 dB below clipping monitoring all gain stages

Dynamics Processor Functions:

Expander/Gate

Threshold Range:	Off to +15 dBu
Exp/Gate Threshold Meter:	2-segment LED bar graph at Below (-) and Above (+)
Ratio:	1.2:1 to 8:1
Knee:	OverEasy®
Attack Time:	< 100 µsec from maximum depth
Release Time:	Program-dependent

Compressor

Threshold Range:	-40 dBu to +20 dBu
Ratio:	1:1 to ∞:1
Threshold Characteristic:	OverEasy® or hard knee, front panel switch
Compressor Threshold Meter:	3-segment LED bar graph at Below (-), OverEasy® (O), and Above (+)
Attack/Release Characteristic:	Automatic Program-Dependent
Attack/Release Modes:	Normal or Slow, front panel switch
Normal Auto Attack Time:	Typically 15 ms for 10 dB, 5 ms for 20 dB, 3 ms for 30 dB
Normal Auto Release Time:	Typically 120 dB/sec rate
Slow Auto Attack Time:	Typically 90 ms for 10 dB, 30 ms for 20 dB, 18 ms for 30 dB
Slow Auto Release Time:	Typically 20 dB/sec rate
Output Gain:	-20 to +20 dB
Gain Reduction Meter:	8-segment LED bar graph at 1, 3, 6, 10, 15, 20, 25, and 30 dB

De-esser

Threshold:	
Type:	Wideband gain reduction
Frequency:	800 Hz to 10 kHz
Attack/Release:	Program-dependent
Gain Reduction Meter:	8-segment LED bar graph at 1, 3, 6, 10, 15, 20, 25, and 30 dB

Limiter

Threshold Range:	+4 dBu to +24 dBu (off)
PeakStop®:	1 LED to indicate PeakStop® limiting
Ratio:	∞:1
Limiter Type:	PeakStopPlus™ two-stage limiter
Stage 1:	Instantaneous Transient Clamp™
Attack Time:	Zero
Release Time:	Zero
Stage 2:	Intelligent Predictive Limiter™
Attack Time:	Program-dependent, typically < 5 msec
Release Time:	Program-dependent, typically 22 dB/sec rate

General

Signal source:	Mic Pre Output or Processor Line Input, front panel switch
Processor Bypass:	Front panel switch
Input/Output Meter:	8-segment LED bar graph at -24, -18, -12, -6, 0, +6, +12, and +18 dBu
Meter Source:	Input level or Output level, front panel switch

Options

Mic Pre Output Transformer:	Jensen® JT-123-dbx or JT-11-dbx, BCI™ RE-123-dbx or RE-11-dbx
Processor Output Transformer:	Jensen® JT-123-dbx or JT-11-dbx, BCI™ RE-123-dbx or RE-11-dbx
Digital Output:	dbx Type IV™ Conversion System
Dither:	Off, TPDF, or dbx SNR2 ™ dither, front panel switch
Noise Shaping:	Off, dbx Shape 1, or dbx Shape 2, front panel switch
Format:	AES/EBU or S/PDIF, rear panel switch
Sample Rate:	44.1 or 48 kHz, rear panel switch
Word Width:	16 or 20-bit, rear panel switch

Power Supply

Operating Voltage:	100 VAC 50/60 Hz; 120 VAC 60 Hz 200-240 VAC 50/60 Hz
Power Switch:	Rear panel rocker
Power Consumption:	30 W
Fuse:	5 X 20 mm 100-120 VAC: 315 mA Slow Blow 200-240 VAC: 160 mA Type T
Mains Connection:	IEC 320 receptacle

Physical

Dimensions:	1.75" H X 19" W X 9" D
Weight:	7.2 lbs. (3.3 kg)
Shipping Weight:	9.1 lbs. (4.1 kg)

Note: Specifications subject to change.

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