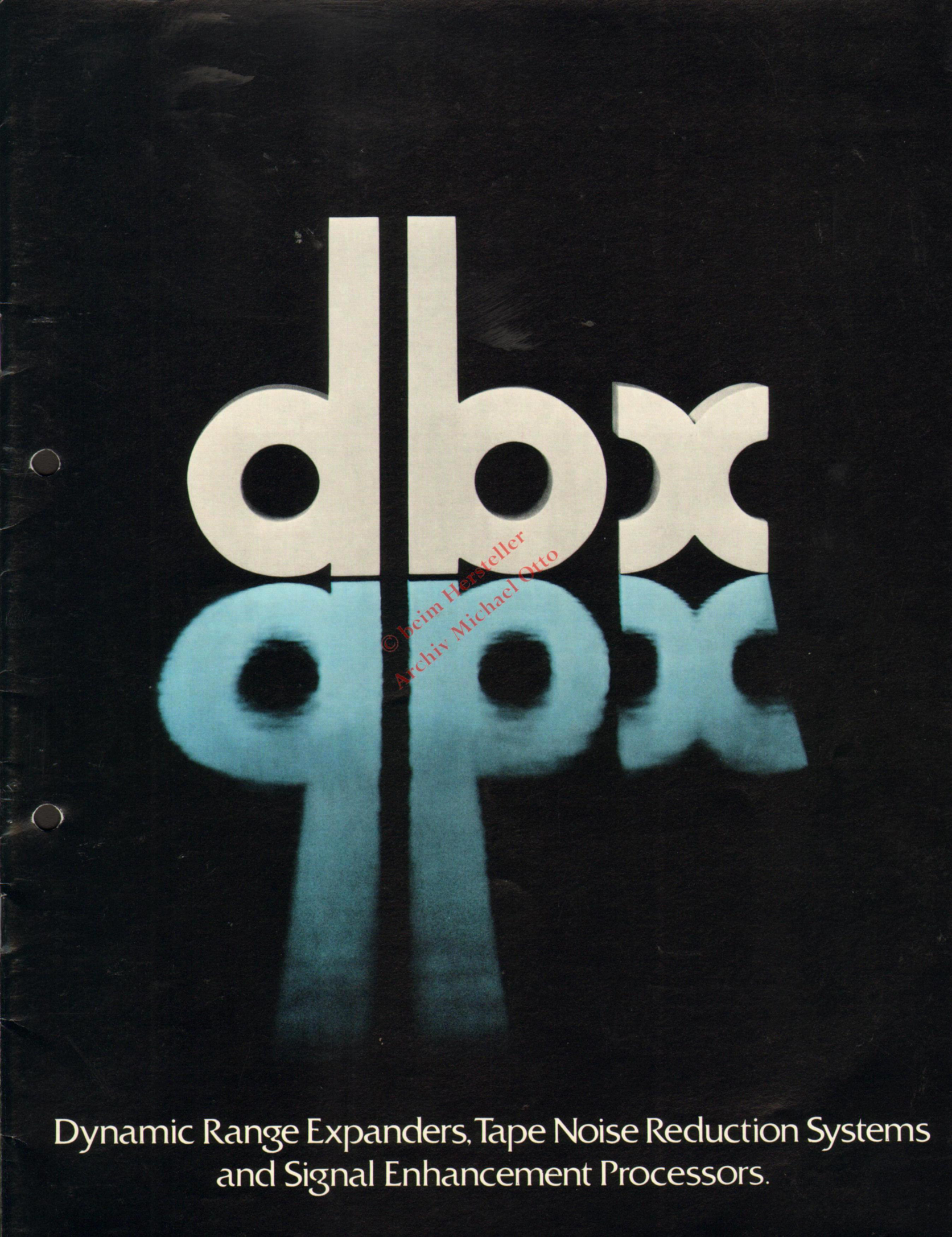


Dynamic Range Expanders, Tape Noise Reduction Systems
and Signal Enhancement Processors.

The Live Concert.

Listening to a live musical performance is one of life's greatest experiences. Your ears hear the subtlest pianissimos, and the most thundering fortissimos. The difference in volume between these extremes is called dynamic range. It is measured in decibels or dB. The human ear can hear sounds ranging from 0 to 130 dB of sound pressure level. Any sound louder than that causes pain. The range between quiet and loud portions of live music can be up to 100dB. It is this dynamic range that gives us the contrast and startling intensity of a live concert, whether it's the intimacy of a string quartet, the power of a symphony orchestra, or the sheer energy of a good rock group.

The Dead Concert.

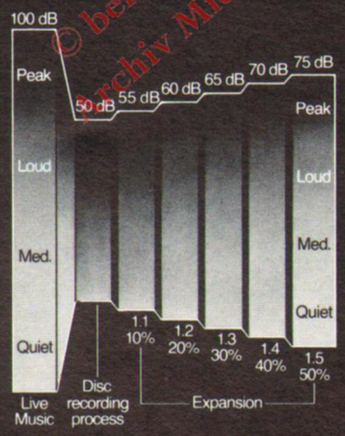
Unfortunately, that intensity is altered in the recording and broadcast process. Due to technical limitations of records and tapes, the dynamic range of sound you hear over your hi fi – no matter how good your hi fi – is typically 25-40 dB, and at very best, only 60 dB. What happens to the other 40-75 dB? It gets compressed, or chopped off altogether. So when you compare what you hear at a live concert to what you hear over your hi fi, you notice that the resulting music sounds as if it were flattened, or muffled in some way. It lacks the punch and definition of a live concert. Sounds are muddied, because the quiets are made louder, and the louds are made quieter. The loud and quiet sounds are all pushed towards the middle.

A Solution – Dynamic Range Expansion.

Dynamic range expansion reverses the compression process that occurs in recording and broadcasting. It restores the space between quiet and loud. When you use an expander, louds get louder – just the way you hear them at a live concert – and quiets get quieter – just the way you hear them at a live concert. But some expanders operate only on a portion of the signal. This throws the music's balance out of proportion. These expanders caricature your music, instead of restoring its missing dynamic range.

The Solution – The dbx Linear Dynamic Range Expander.

Only dbx has solved this problem. We have developed the first linear expanders which expand all frequencies and all levels over the entire dynamic range, by the same proportion. That means expansion occurs not only at the louder levels, but also at the quieter levels, indeed, over the entire dynamic range. The keys to this expansion are two patented devices. The dbx rms detector, senses the entire dynamic content of the music. It then instructs the dbx voltage controlled amplifier to precisely increase or decrease level, instantly.



Dynamic range expansion makes loud sounds louder and quiet sounds quieter, just the way you hear them in a live concert.

Records, Cassettes, Broadcasts – All Sound Astonishingly Better Through Your Expensive or Inexpensive Hi-Fi.

No matter how great your system, you'll want to re-play all your tapes and records again through a dbx linear dynamic range expander. You'll hear things you never heard before...more music. And you won't hear things you did hear before... noise (a pleasing side effect of the dbx linear expanders). It will be like listening to your tapes and records for the first time. Only better. And, of course, it goes without saying that a more modest system will also be greatly improved. You'll hear the soft brushwork of a drummer and the loud crescendo of the kettle drums. Every nuance and texture of a symphony string section will have incredible presence. The sharp attack of a brass section jumps out of the speaker. Bass notes regain their punch and clarity. As a matter of fact, we'd like to offer you a friendly challenge. If you think your system can't be improved, drop in on your dbx dealer and listen to a similar system with a dbx linear expander. The difference will startle you. And that's a promise.

DYNAMIC RANGE EXPANSION

118 Linear Dynamic Range Enhancer

The dbx 118 is a single band linear expander...and much more. It is also a compressor, a limiter and a peak unlimiter. In short, it is the most versatile dynamic modifier available today.

Yet, its price is modest.

Notice the expansion/compression control. You can use it to set just the amount of dynamic range expansion you want. Where large level variations are undesirable, you can instead compress the entire dynamic range, bringing the quiet and loud portions of your music closer together.

Just to the left is a threshold control. When expanding, this can be used to set the point in your music's dynamic range below which music becomes quieter, and above which it becomes louder. If you place the button on the far left in the out position, the 118 becomes an above-threshold expander, or peak unlimiter. This means only loud portions of the dynamic range which exceed your pre-set threshold will be expanded, (made louder). Above threshold expansion is most useful for programs which were compressed only at high levels. If your 118 is in compression mode, the reverse is true – it becomes an above threshold compressor or limiter. That means signals rising above your threshold will be made more quiet.

The amber and red LEDs tell you when the signal is above or below threshold. They are your guide in setting threshold levels.

The 118 can be used with Dolby® "B"* tape noise reduction, and will provide additional noise reduction. Two 118's can be coupled to track accurately in four channel applications.

SPECIFICATIONS

Compression ratio: **continuously variable to infinity**

Expansion ratio: **continuously variable to 2.0**

Dynamic range (peak signal to weighted background noise): **110 dB**

Input impedance: **50 K**

Input level (nominal): **300 mV**

Input level (maximum): **30 v RMS**

Output impedance (designed to drive 5 K ohms or greater): **470 ohms**

Output level (maximum, 20 Hz to 20 kHz): **7 v RMS**

Frequency response: **20 Hz to 20 kHz ± .5 dB**

Input noise (unweighted, referenced to 1v): **−85 dBv**

Total harmonic distortion: **0.1% typical at 1.0 expansion, 20 Hz to 20 kHz**

I.M. distortion (SMPTE): **0.15% typical**

Power line requirement (100, 220, and 240 optional for export markets): **117 VAC, 50 to 60 Hz**

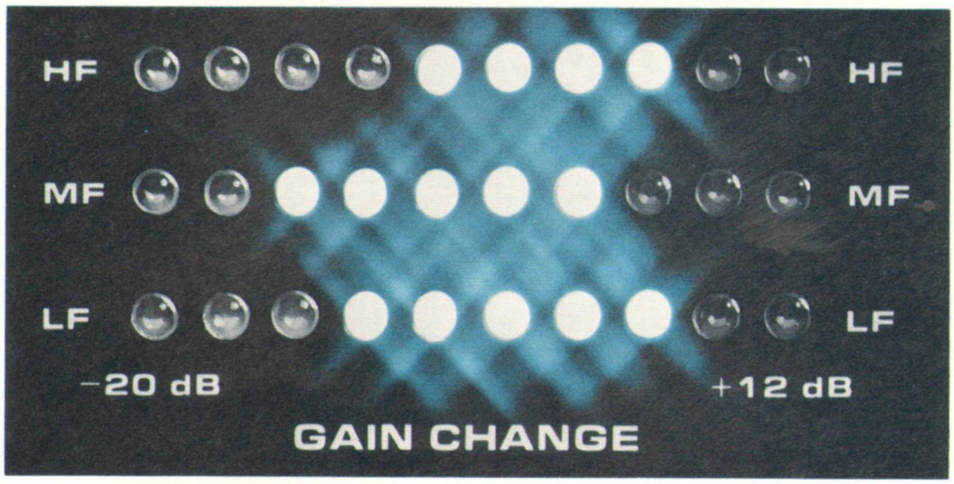
Power line consumption: **5 w**

Size: **3 3/4" (h) x 7 5/16" (w) x 10 1/4" (d) (mm: 95.25 x 185.7 x 260.35)**

Shipping weight: **5 lbs. (2.26 Kg.)**

*'Dolby' is a trademark of Dolby® Laboratories Inc.

3BX Linear Dynamic Range Expander



By dividing the audio spectrum into three separate frequency bands, dbx has created the state-of-the-art in dynamic range expansion. The 3BX incorporates multiple true RMS detectors, and separate voltage controlled amplifiers. That means the bass, midrange, and treble portions of your music are linearly expanded individually. This achieves stunning results unobtainable from a single band expander system.

The degree of expansion is at your option, up to 1.5, (which is a 50 percent increase in dynamic range).

Three rows of yellow and red LEDs show exactly how much expansion you're enjoying in each of the three frequency bands. The transition level slider sets the point below which the 3BX makes your music quieter and above which the 3BX makes your music louder.

The 3BX also features source/tape and pre/post switches, in case you wish to use it with a tape recorder. These controls permit you to switch the unit into the system either before or after your tape deck, allowing complete recording or playback flexibility, without touching the cables on the back.

The 3BX, unlike other expanders, virtually eliminates pumping and breathing during quiet passages, by knowing instantly what portions of your music require expansion.

SPECIFICATIONS

Expansion ratio: **continuously adjustable to 1.5**

Dynamic range (peak signal to weighted background noise): **110 dB**

Input impedance: **50 K**

Input level (nominal): **300 mV**

Input level (maximum): **7 v RMS**

Output impedance (designed to drive 5 K ohms or greater): **100 ohms**

Output level (maximum, 20 Hz to 20 kHz): **7 v RMS**

Frequency response: **20Hz to 20 kHz ± .5 dB**

Input noise (unweighted, referenced to 1 v): **−85dBv**

Total harmonic distortion: **0.1% typical at 1.0 expansion, 20 Hz to 20 kHz**

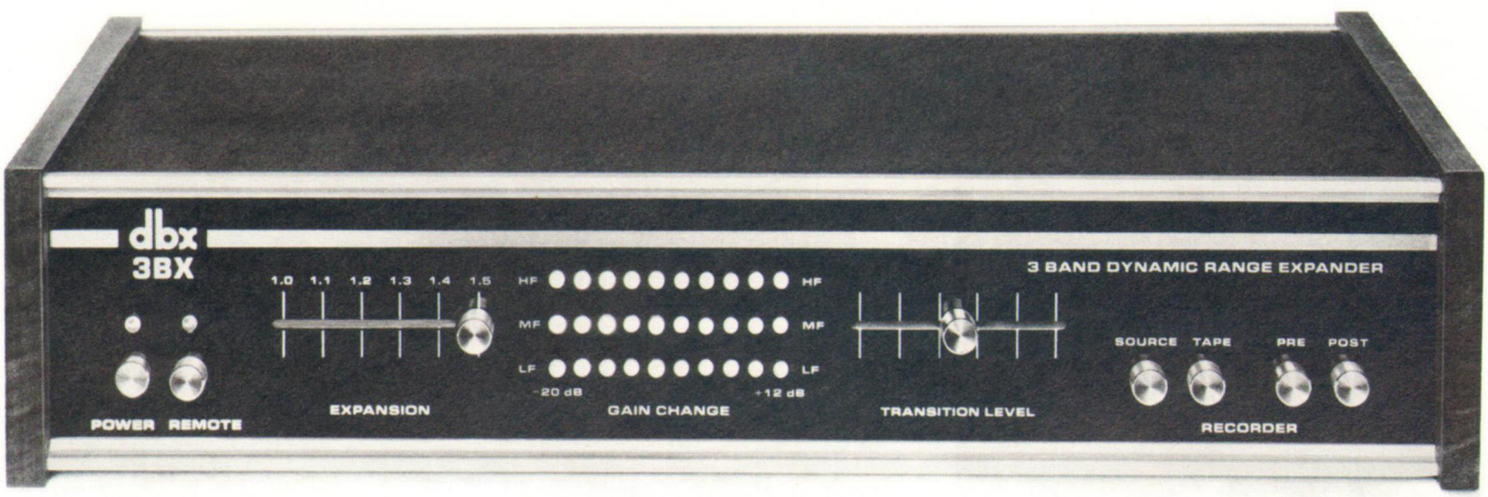
I.M. distortion (SMPTE): **0.15% typical**

Power line requirement (100, 220, 240 optional for export markets): **117 VAC 50 to 60 Hz**

Power line consumption: **30 w**

Size: **3 3/4″ (h) x 17 3/4″ (w) x 10 1/4″ (d) (mm: 95.25 x 450.85 x 260.35)**

Shipping weight: **12 lbs. (5.44 Kg.)**



Tape Noise – Why Worry About it?

Maybe you've become accustomed to a little noise coming through your speakers. But why add to it when you do any live recording, or tape copying? Unless you record with a dbx II Tape Noise Reduction System, that's exactly what will happen. Your machine will add audible noise to your music.

Tape Noise – Why Do We Have It In the First Place?

Much as we'd like to get rid of it, tape noise is inherent – even with the best studio tape recorders. It's caused by the iron oxide particles on the tape passing over the record and playback heads.

More Noise Means Less Music

Recording engineers allow for tape noise by reducing the dynamic range (the space between loud and quiet portions of recorded music). And that means you hear less music. The music you do hear sounds squeezed, or compressed. This is done so that quiet sounds will not get buried in the noise, and loud sounds don't overload the tape. So the recording engineer makes the quiet sounds louder, and the loud sounds quieter. And that certainly is not what the composer had in mind when he wrote the music.

How to Throw Out The Noise Without Throwing Out The Music

I. DOLBY® "B", OR GETTING RID OF SOME OF THE NOISE

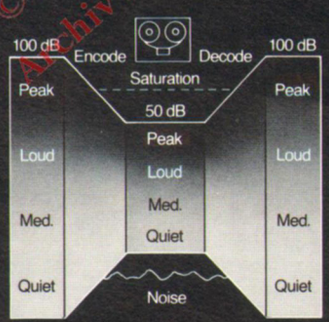
The Dolby "B" noise reduction system reduces high frequency tape noise by approximately 7 to 10 dB. That's not bad. But while it reduces high frequency noise in quiet passages, it leaves low frequency noise right where it was. In your ear.

II. dbx II, OR, GETTING RID OF ALL OF THE NOISE

The dbx II Tape Noise Reduction System reduces tape background noise by 30 dB at all frequencies. And that's more than just OK. That's better than any other system. dbx II also increases tape headroom by some 10 dB, and significantly reduces the risk of tape overload (putting sounds on tape which distort because they are too loud). In playback, you'll get a mirror image indistinguishable from the original music source – with absolutely no audible noise added by the tape recording process.

Why dbx II Is Better Than Dolby "B"

The Dolby "B" system is inherently non-linear, operating only below a certain threshold which must be level matched during recording and playback. This step is difficult at best, so nobody seems to bother. And most tape decks with built-in Dolby don't even have accurate level matching capability. The dbx II Tape Noise Reduction System, on the other hand, operates linearly at all frequencies and over the entire dynamic range. That means level matching procedures are unnecessary. Moreover, you will hear a vast amount of noise reduction over the entire dynamic range, and at all frequencies, and not just at low level signals at high frequencies.



dbx II tape noise reduction uses 1:2 compression to enable you to fit your music onto tape above the noise level, and below saturation; it then uses 2:1 expansion to restore dynamic range, with no audible tape noise added by the recording process.

How the dbx II System Works

You might want to add a new word to your vocabulary. Compander. It describes how a dbx II works (compression and expansion). First, during recording, all levels are linearly compressed by one half over the entire audio spectrum. It then becomes an easy matter to place the signal on the tape comfortably above the noise level, and below the point of tape saturation. Then, upon playback, the signal goes into the unit's expander section, which linearly expands and restores the dynamic range to exactly what it was on the original. The key is a true rms detector, an ingenious device which precisely and instantly measures the dynamic content of the music. The patented dbx voltage controlled amplifier answers the rms detector's commands to precisely increase or decrease level during recording and playback. The end result is an exact, mirror image reconstruction of the original music, with no audible noise added, and fully preserved dynamics.

Listen To It. Just Listen To It.

You'll be amazed at what you don't hear.

TAPE NOISE REDUCTION

122 and 124 dbx II
Tape Noise Reduction Systems

The only consumer tape noise reduction system available which allows you to make tape copies that sound exactly the same as the original is the dbx II. It assures that no audible tape noise is added by the tape recording process. Only noise present in the original source will survive the dbx II system.

The 122 is a two-channel system, and the 124 a four-channel system, (both models switchable to record or play). However, the 124, if used for stereo, allows you to simultaneously monitor the noise-reduced signal off tape as you record. You can use both to record live, tape to tape, record to tape, and also for dubbing and taping off radio.

Complex level matching and alignment procedures are unnecessary, since these systems operate linearly, using the dbx patented true rms detectors and voltage controlled amplifiers. This is not the case with competitive systems, such as Dolby® "B". Moreover, Dolby "B" gives you only 7 to 10 dB of high frequency noise reduction, vs. an astounding 30 dB reduction of tape background noise at all frequencies with the dbx II system. Other features include a bypass switch, power on/off plus a dbx disc playback button. The latter is to be used only to decode commercially available dbx encoded discs, which provide totally noise-free, full dynamic range music reproduction. A playback level control is provided for your convenience.

SPECIFICATIONS

Compression ratio (fixed): **2:1**

Expansion ratio: (fixed): **1:2**

Dynamic range (peak signal to weighted background noise): **110 dB**

Input impedance: **50 K**

Input level (nominal): **300 mV**

Input level (maximum) **7 v RMS**

Output impedance (designed to drive 5 K ohms or greater): **470 ohms**

Output level (maximum, 20 Hz to 20 kHz): **7 v RMS**

Frequency response: **30 Hz to 20 kHz ± .5 dB**

Input noise (unweighted, referenced to 1 v): **−85 dBv**

Total harmonic distortion: **0.5% typical, 30 Hz to 15 kHz**

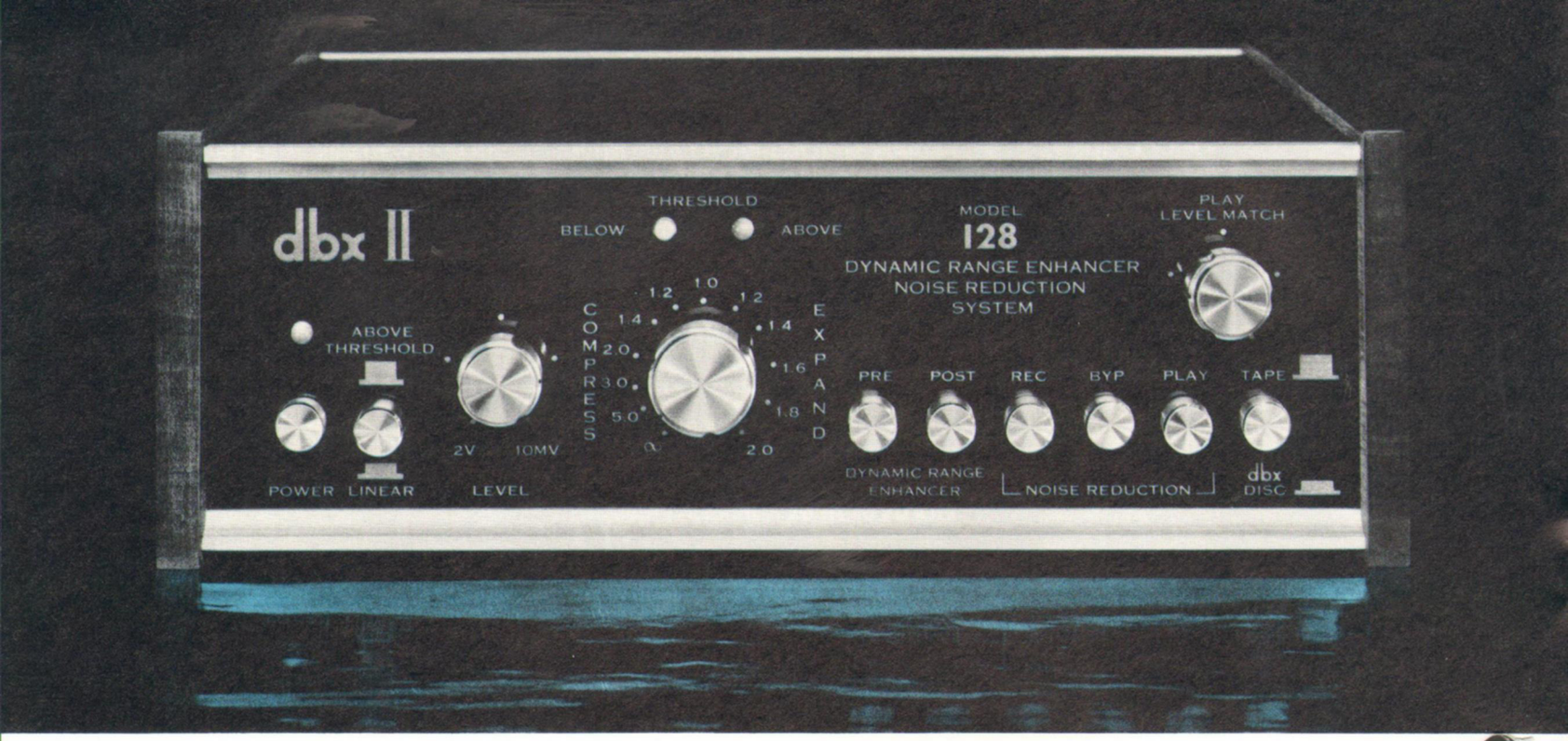
I.M. distortion (SMPTE): **0.15% typical**

Power line requirement (100, 220 and 240 optional for export markets): **117 VAC, 50 to 60 Hz**

Power line consumption: **5 w** (122); **7 w** (124)

Size: **3 3/4″ (h) x 11″ (w) x 10 1/4″ (d) (mm: 95.25 x 279.4 x 260.35)**

Shipping weight: **7 lbs. (3.17 Kg.)**



128 Linear Dynamic Range Enhancer Tape Noise Reduction System

How would you like to make copies of records that sound better than the original? With reduced noise, and with increased dynamic range? The one machine that can do all that is the dbx 128, which combines the dynamic range enhancement features of the 118 with the tape noise reduction features of the 122.

These two combined modes permit you to expand a recorded program, then dbx II encode the expanded material, so you can easily fit it onto tape. When played in decoded form, you'll hear what you didn't hear on the original – the realism of louder louds and quieter quiets. Moreover, you hear a lot less of something else you heard on the original – annoying surface noise. For example, suppose you expanded a 40 dB dynamic range program by a factor of 1.5, which would result in a dynamic range of 60dB. You could then process it through the dbx II tape noise reduction section of the 128, which would reduce the dynamic range to 30 dB. This allows you to place the program on tape above the noise level and below saturation. When decoded, the program would have a dynamic range of 60 dB, the same as the expanded original. The tape copy would have 50% more dynamic range than the record, plus the combined benefit of reduced surface noise from the original, due to expansion, with no audible noise added by the tape recording process.

Additional features include power on/off switch, pre/post switches so you can expand material either before or after your tape recorder, in addition to dbx encoded disc playback capability. This provides you with complete front panel flexibility.

SPECIFICATIONS

ENHANCEMENT SECTION ONLY

Compression ratio: **continuously variable to infinity**

Expansion ratio: **continuously variable to 2.0**

Input level (maximum): **30 v RMS**

Frequency response: **20 Hz to 20 kHz ± .5%**

Total harmonic distortion: **0.1% typical at 1.0 expansion, 20 Hz to 20 kHz**

TAPE NOISE REDUCTION SECTION ONLY

Compression ratio (fixed): **2:1**

Expansion ratio (fixed): **1:2**

Input level (maximum): **7 v RMS**

Frequency response: **30 Hz to 20 kHz ± .5 dB**

Total harmonic distortion: **0.5% typical, 30 Hz to 20 kHz**

BOTH SECTIONS

Dynamic range (peak signal to weighted background noise): **110 dB**

Input impedance: **50 K**

Input level (nominal): **300 mV**

Output impedance (designed to drive 5 K ohms or greater): **470 ohms**

Output level (maximum, 20 Hz to 20 kHz): **7 v RMS**

Input noise (unweighted, referenced to 1 v): **−85dBv**

I.M. distortion (SMPTE): **0.15% typical**

Power line requirement (100, 220, 240 optional for export markets): **117 VAC, 50 to 60 Hz**

Power line consumption: **10 w**

Size: **3 3/4" (h) x 11" (w) x 10 1/4" (d) (mm: 95.25 x 279.4 x 260.35)**

Shipping weight: **8 lbs. (3.62 Kg.)**

Introducing the **Boom Box** Subharmonic Synthesizer

Here is the device you need to restore the lows to your life. The dbx Boom Box. It regenerates the low frequency bass that's all too frequently left out in the recording process. And it recreates the bottom octave so you can hear heightened accuracy in the bass, and actually feel the power inherent in a live bass note. The "solidness" and three-dimensionality of bass heard in a live performance – which can be physically experienced – are brought back to life.

Why You Need It – Because Life Is Not All Highs.

In order to get as much music as possible on a record, engineers must limit the depth and excursion of record grooves. So in the recording process, the lower frequencies are often deliberately cut off.

What It Does.

Most recordings give an accurate account of music's frequency range down to about 60Hz. The octave between 25 and 50Hz is most often missing or very weak. The Boom Box recreates this lost portion of the audio spectrum by utilizing program in the region above 60Hz to synthesize signals one octave lower. It then mixes them back into the program.

Controls.

There are just two controls on the Model 100. One is a synthesizer control – a sort of gas pedal if you will – that sets the amount of synthesized low frequencies you put into the system. The other is a low frequency boost control specially contoured to produce a smooth blend of the synthesized notes into the music.

How to Use It.

Use your ears. As you regulate the low frequency boost control, your ear will tell you when it is set "right" – when the signal fills in the gaps in the lows that rob you of the sensation of a live performance. The Boom Box can be enjoyed with almost any component system. It is easily inserted in the tape monitor circuit of your receiver or amplifier.

The Experience Beyond.

The Boom Box is perfectly capable of creating a new dimension, if you have a higher-powered system. The best device to "hear" it with in this fashion is your whole body. You can turn everything up until sound becomes a visceral sensation. Huge blasts of air from the pulsing low frequencies attack your chest and stomach – producing a sensation unlike anything you've ever felt. The room crawls with low frequency energy, and you, in effect, become a resonator. Sounds become "Supereal" and the sensation is unlike anything you have ever experienced from recorded music.

The Perfect Setting To Hear, And Feel It.

Your local dbx dealer can demonstrate the Boom Box. But a note of caution. Be prepared for the experience that goes beyond listening.

SPECIFICATIONS

Dynamic range (peak signal to weighted background noise): **100 dB**

Input impedance: **47 K**

Input level (nominal): **300 mV**

Input level (maximum): **7 v RMS**

Output impedance (designed to drive 5 K ohms or greater): **470 ohms**

Output level (maximum, 20 Hz to 20 kHz): **7 v RMS**

Frequency response: **20 Hz to 20 kHz ± 1 dB**

Input Noise (unweighted, referenced to 1 v): **−85 dBv**

Total harmonic distortion: **0.1% typical, main signal channel**

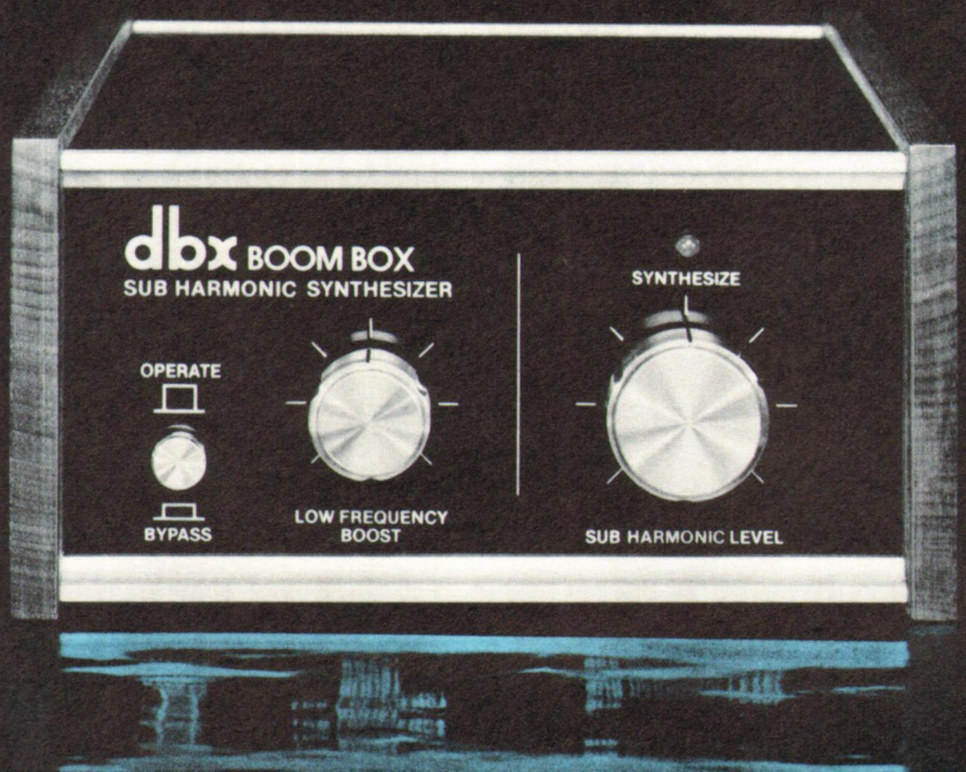
I.M. distortion (SMPTE): **0.15%, main signal channel**

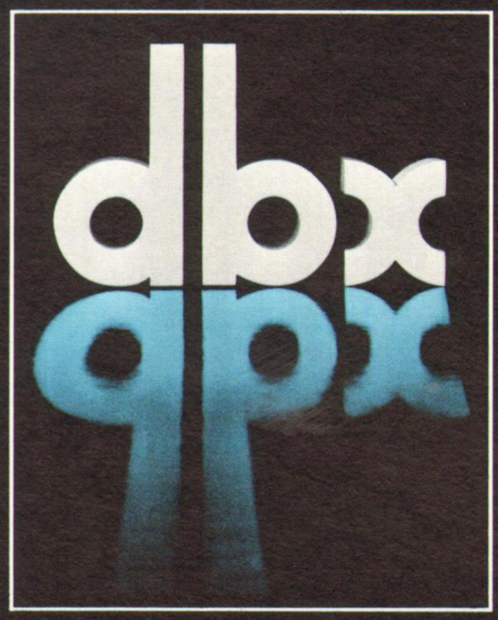
Power line requirement (100, 220, 240 optional for export markets): **117 VAC, 50 to 60 Hz**

Power line consumption: **10 w**

Size: **3 3/4" (h) x 7 5/16" (w) x 10 1/4" (d) (mm: 95.25 x 185.7 x 260.35)**

Shipping weight: **5 lbs. (2.26 Kg.)**





From its beginning in 1971, dbx has made a commitment to develop the next generation of music reproduction technology. The founding inventors and engineers have continued to meet the challenge of this commitment, from the introduction of the first dbx consumer product, the 117 Dynamic Range Expander, through the current line of audio-oriented products and those on our drawing boards. dbx has consistently manufactured and marketed audio components which not only advance the state-of-the-art in their class, but also move high fidelity closer to its stated goal: to erase any perceivable difference between live and recorded music.

dbx makes products for the home and for the professional and semi-professional recording studio. These include expanders, tape noise reduction systems, compressor/limiters, subharmonic-synthesizers, decibel meters, voltage-controlled amplifiers, and accessories. Each dbx product passes individual quality control and testing procedures before it ever leaves the firm's plants. More than 25 percent of dbx's production force is devoted to these quality assurance procedures. Independent testing organizations, as well as high fidelity critics and publications consistently award their highest ratings to dbx equipment. dbx products are available from better audio dealers throughout the United States, and the world.

dbx corporate headquarters and manufacturing facilities are all located in the Boston, Massachusetts area.

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