

silence & **super-dynamic range**

When the music's feeling good, make it perfect. dbx.

There are moments in a live performance of music when the music touches something special inside.

When you want to shut your eyes and quietly drift with it.

Or when you just have to get up and dance.

It's that transporting, thrilling quality of live music that the manufacturers of stereo equipment have always sought to capture.

And failed.

Failed, that is, until dbx.

Because by adding a dbx component to even a modest stereo system you can, for the first time, bring the vibrancy, the excitement of being there, into your living room.

Or even into your car.

What's wrong with today's stereo equipment?

In a word, nothing.

Today's sophisticated stereos *could* deliver the impact of a live performance, but for one thing.

The *sources* of recorded music – the tapes, records and FM you play on your stereo – aren't nearly so sophisticated.

Tapes hiss. Records snap, crackle and pop. And none of the recorded sources of music has anywhere near the musical impact of a live performance.

Even the room in which you play your stereo alters the tonal balance of the original recording.

dbx has solved these problems completely. So that by adding a dbx component to the stereo system you already own, your stereo can do what the manufacturer intended it to do.

It can capture the realism, the dynamism, the "live-ness" of a live performance.

It is a difference no other component can make. A dramatic difference you can hear.

How did we do it?

dbx tackled the problem at the source.

We developed a whole new process of recording called *linear decibel companding*. Originally for professional recording studios, it's based on two unique dbx inventions: Voltage Control Amplifiers (VCA) and RMS level detectors. By applying this technology to our components, we successfully overcame virtually all the limitations of tapes, discs and FM stereo.

Ordinarily, recording studio engineers are forced to compress the dynamic range of music – literally squeeze it onto the record or tape – to fit the limitations of those media.

Dynamic range is the difference in volume, measured in decibels (dB), between the loudest and softest passages in music. Live performances produce about 90dB of dynamic range. But even the best of the audiophile records are able to fit only 50 to 60dB into the grooves. Tape is even more limited.

The result is that the loud passages don't sound as loud as they should, nor the soft passages as quiet.

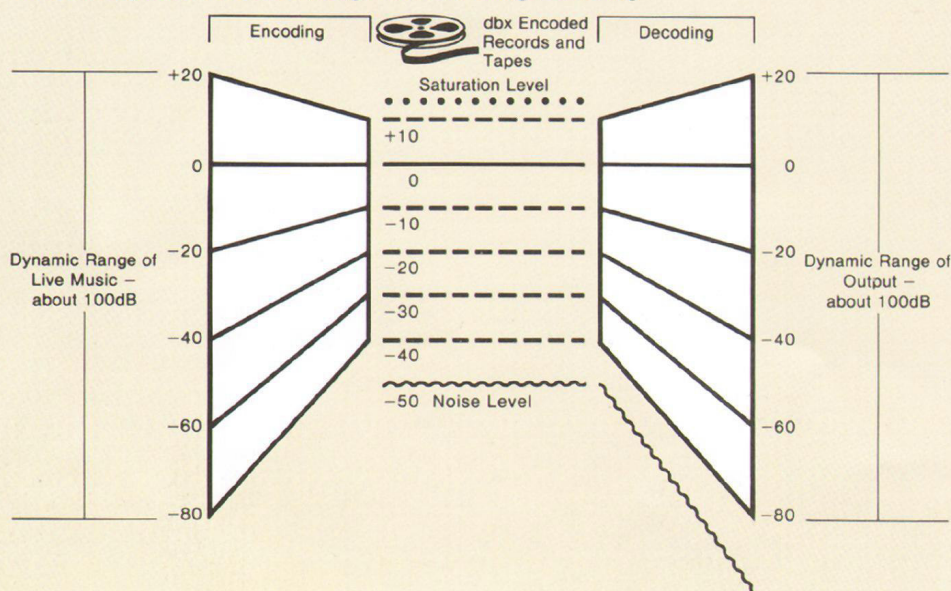
dbx does it differently.

We compress the dynamic range as the music signal is transferred onto tape or disc, but in an exact 2:1 ratio. This *encoded* signal fits comfortably within the dynamic range limitations of the media.

Then, when played through a dbx component, the signal is *decoded*, expanded in an exact mirror image ratio of 1:2.

The full dynamic range of the signal is thus restored.

Record/Playback Process through dbx Encoding/Decoding



The results are extraordinary.

Full dynamic range that means a stunning difference from the recorded music you're used to hearing. In fact, you may be surprised just how cramped ordinary music is by comparison.

Because now your music isn't just loud where it's supposed to be. It thunders.

It isn't just soft where it's supposed to be. It whispers.

Linear decibel companding also proved to be many times more effective than competing systems in solving the other major obstacle to realistic sound reproduction: tape hiss.

dbx tape noise reduction systems are used in about 80% of the professional recording studios around the world, and are the standard of home recording, too.

Why?

You can hear for yourself.

Just add a dbx Tape Noise Reduction System to any tape deck, and listen to the difference. Other noise reduction systems *reduce* hiss. But only dbx *eliminates* the tape hiss added by your cassettes and reels (50dB of noise reduction, instead of the 20dB of competing systems).

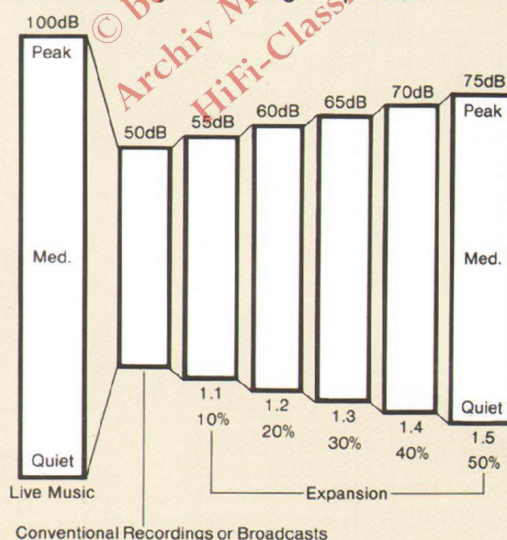
We've even reinvented the record.

By using the same encode-decode technique, dbx Discs let you hear music with dynamic range equal to that of studio master tapes.

And our Digital dbx Discs take the art a step further still. Produced from tapes made by the new digital recording process, Digital dbx Discs deliver the full 90dB dynamic range of a live performance.

Play them on your system using the dbx Disc Decoder and for the first time you can listen to the music. Instead of the noise on the record.

dbx Linear Dynamic Range Expansion



Hear a dbx live performance today.

There are a number of other extraordinary dbx components designed to bring you closer to your music than ever before.

Our dramatic Dynamic Range Expanders for instance. Adapted from our Noise Reduction Technology, expanders allow you to increase the dynamic range of any source – conventional records and tapes, and even FM – by up to 50%. They recreate the excitement and emotional impact of a live performance. Used alone or with dbx Noise Reduction, they allow sonic realism with any stereo system.

And the unique dbx 20/20 Computerized Equalizer/Analyzer – the first equalizer to achieve flat frequency response for any location in a room – automatically.

And the dbx Model 22 Car Decoder – the only component that makes car stereo the equal of home stereo.

Take a look inside at these and our other products. Read about some of the remarkable things they can do for your music.

But don't just listen to the words.

Go to an authorized dbx dealer.

Listen to a clarity in recorded music you've never heard before outside the concert hall.

And dust off your dancing shoes.

224

Tape Noise Reduction Unit

The dbx 224 allows your tape recorder to do what no one's been able to do in the home before: achieve sound reproduction that approaches that of digital recording.

Other noise reduction systems reduce tape hiss in limited areas of the audio frequency range. But the 224 reduces tape hiss by more than 30dB across the "entire" audio frequency range and adds 10dB more recording headroom.

So just by adding the 224 to your present recorder you hear not just *less* tape hiss, as with competing systems. You hear *no* tape hiss.

And with dbx encoded tapes you get the full musical impact of your source material – in excess of 90dB of dynamic range on open reel or cassette. The range of a live performance.

Full monitoring capability with three-head recorders. Also compatible with all two-head recorders.

A built-in dbx Disc Decoder lets you play dbx Discs and Digital dbx Discs.

222

Tape Noise Reduction Unit

The dbx 222 delivers the musical impact of the 224, at an economical price.

It incorporates all of the same features, except monitoring. Recommended for two-head recorders, but, of course, compatible with three-head recorders as well (without monitoring capability).

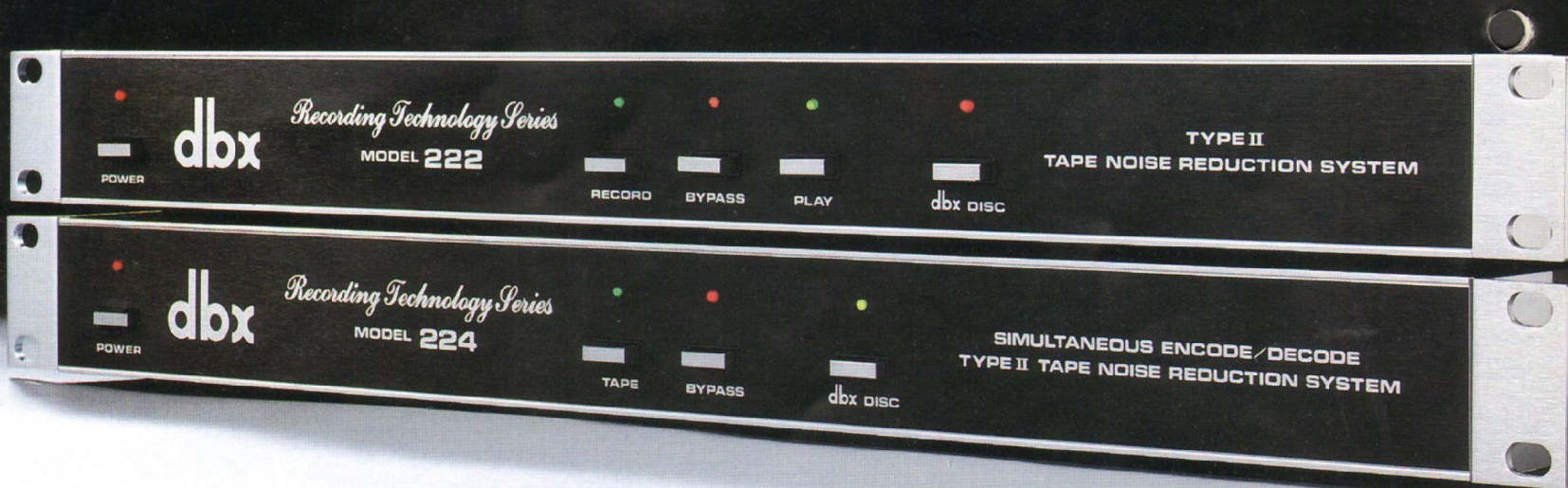
22

Car Decoder

Another dbx first, the Model 22 allows you the same high fidelity on the road that you get in your home.

So you can play your own dbx tapes completely noise-free. Play dbx Cassettes, or record dbx Discs yourself, and get the excitement of full dynamic range.

Add a Model 22 to a quality car tape deck, and make music worth getting out of the house for.



3BX Series Two

Dynamic Range Expander

50% more dynamic range. The equal of a live performance.

Almost no noise at all.

The 3BX Series Two divides audible frequencies into three bands – HF (High Frequencies), MF (Mid Frequencies), and LF (Low Frequencies) – and handles each separately.

This ensures that an overly loud bass note, for example, will not artificially raise the level of mid or high frequencies present at the same time. It is extremely effective with highly complex musical pieces.

Simple slider controls let you choose however much expansion you desire, from no expansion up to 50% expansion, and the transition level, the threshold at which upward or downward expansion occurs.

The LED display shows you how much upward and downward expansion is occurring at each of the three frequency bands.

For full flexibility Pre and Post switching is available to you. The Pre position

allows you to expand a signal prior to the tape deck for recording purposes, while the Post position allows expansion after the tape deck to expand a normal tape or signal source if so desired.

In short, the 3BX Series Two can make records, tapes, and radio and TV broadcasts approach the realism of a live performance. Right in the home.

Don't forget the pleasant side benefit of up to 20dB of source noise reduction.

1BX Series Two

Dynamic Range Expander

Affordably priced. Yet up to 50% more dynamic range.

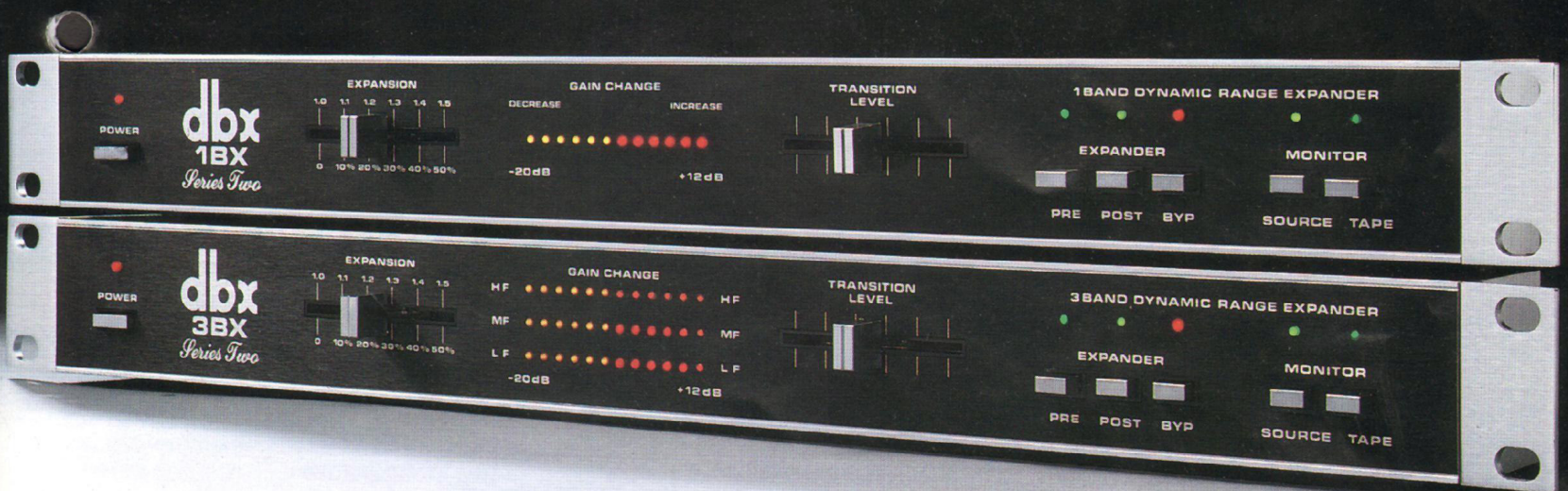
Now everyone can enjoy a new, fuller, more realistic sound experience from their present records, tapes, and radio and TV broadcasts.

Rock music benefits from a large amount of expansion while chamber music and solo works require just a little.

With a little experimentation, you can easily determine just the right amount. For any type of music.

Again, don't forget the pleasant side benefit of dynamic range expansion – up to 20dB of source noise reduction.

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228

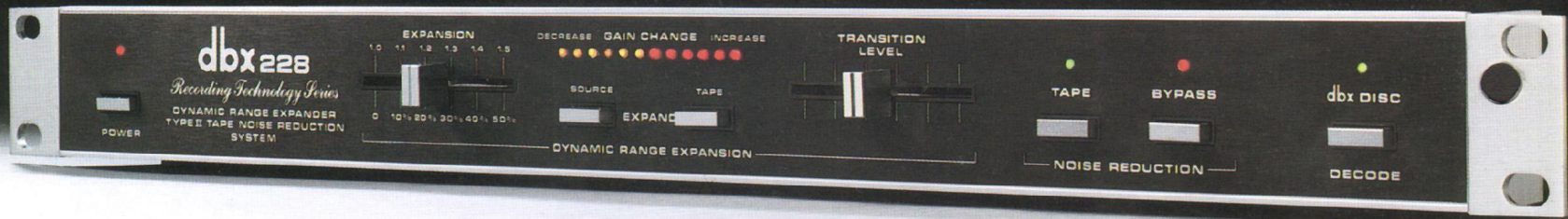
Tape Noise Reduction Unit/Dynamic Range Expander

This one is something special, even for dbx. It combines the features of the dbx 224 Tape Noise Reduction System and the 1BX Series Two Dynamic Range Expander.

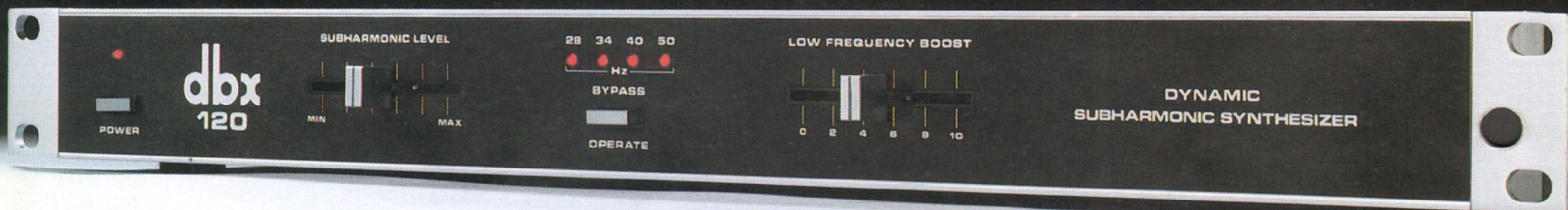
So, for the first time, you can solve virtually all the limitations of all your listening media. With a single component.

Unprecedented dynamic range. Tape hiss *elimination*. And a built-in dbx Disc Decoder.

With the 228, every piece of music you play – tapes, discs, FM – puts you front and center at the concert hall.



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120

Subharmonic Synthesizer

Recreate the powerful drive of a disco in your home. Create bass you "feel" rather than hear.

The dbx 120 does this by putting back into the music the lowest octave that the recording engineers took out.

Why did they take them out?

Because very low bass notes are difficult to record, and difficult for average

stereo systems to play back.

How does the dbx 120 work?

It samples all frequencies between 55Hz and 110Hz, and synthesizes corresponding frequencies exactly one octave lower (between 27.5Hz and 55Hz), that are then mixed back into the music.

By recreating the natural subharmonics that were taken out during the recording process, music takes on a new life, a new power that has to be felt to be believed.

20/20

Computerized Equalizer/Analyzer

The dbx 20/20 is the world's first automatic equalizing system.

It combines a microprocessor-controlled 10-band graphic equalizer, real-

time analyzer, pink noise generator, sound-pressure level meter and includes a calibrated microphone.

Unlike other equalizers, the 20/20 automatically adjusts for the effects of furniture, drapes, and other acoustical factors in your room. The result is highly accurate tonal balance, realistic sound, and sharp definition of every instrument.

Simply place the microphone at any

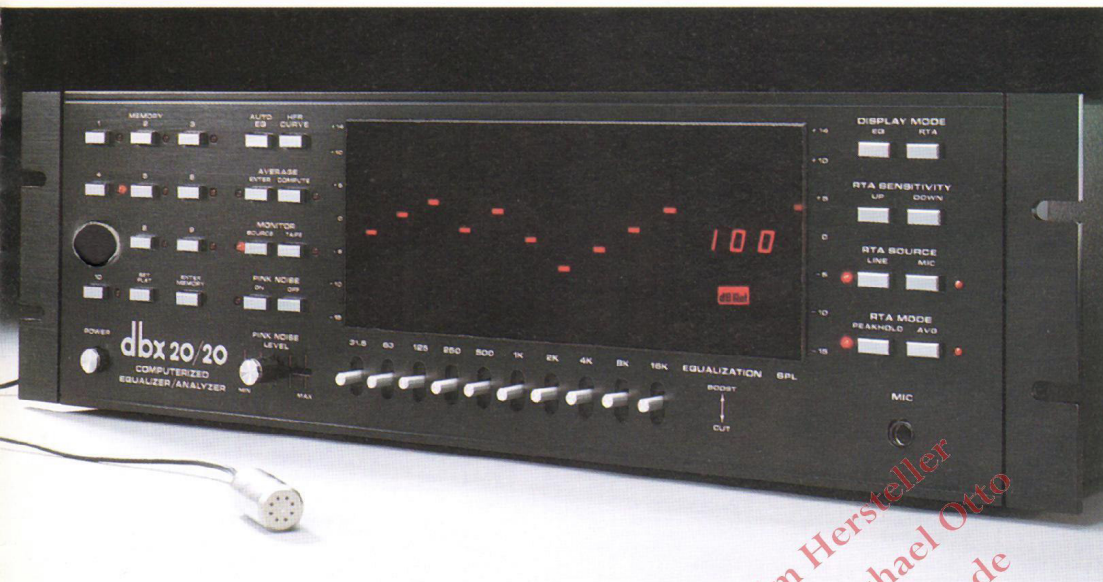
desired listening position and let the computer find the precise equalization curve. In only 15 seconds.

And because the 20/20 has ten memory locations, you can equalize each of your favorite listening positions, then store them for later recall.

The 20/20 will even average several listening positions automatically for the best frequency response over a wide listening area.

Some of the advanced features of the 20/20 include LED readouts on all ten bands, precision switches instead of the traditional slide controls for manual adjustment, and a high-frequency rolloff curve (HFR) that automatically simulates the frequency response of a music hall.

The dbx 20/20 is the state-of-the-art in equalizers, and a must for anyone who is truly serious about high fidelity.



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200

Program Route Selector

Hook together up to three decks, three sound processors and a noise reduction unit. All through a single tape-monitor loop of your amp or receiver.

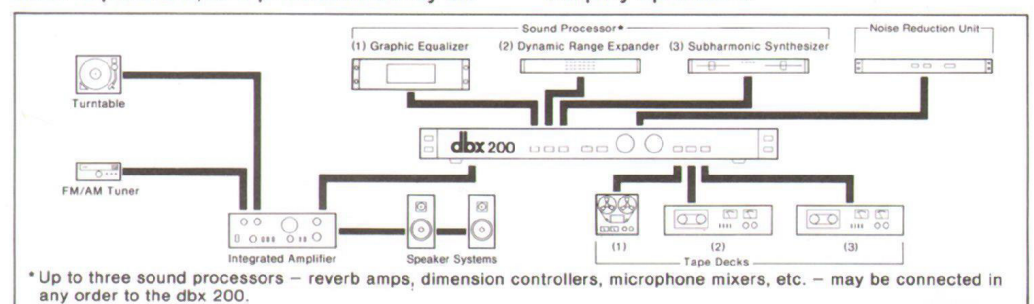
Sound processors (graphic equalizers, reverb units, dynamic range expanders, subharmonic synthesizers, etc.) are essential for today's high-fidelity music, but hooking them all up is a problem.

But no longer. The dbx 200 Program Route Selector solves all of your problems.

Tape copying in any direction from any deck is possible, and processors may be

simply switched in or out by just touching a pushbutton.

The dbx 200 is the logical way to simplify operation.



Dimensions (W x H x D): 17-5/16" x 1-3/4" x 7-1/2" Weight: 3-15/16 lbs.

dbx Discs and Tapes

Enjoy digital sound now.

All dbx noise reduction units decode dbx Discs and Digital dbx Discs, the first commercially available records that provide the full dynamic range of a live performance in the home.

Over 200 titles from 38 record companies are available. And we're adding more monthly.

Artists like Police, J. Geils, Air Supply, The Crusaders, Dave Brubeck, Ella Fitzgerald. And digital classical recordings

like Holst's *The Planets*, Mahler's *Symphony No. 4*, and Vivaldi's *The Four Seasons*.

You'll find the sound quality of dbx Discs is indistinguishable from original master recordings.

And if you prefer dbx-encoded cassette tapes, you can enjoy all the benefits of digital sound today at home or in the car. For a full listing, pick up a catalog at your dbx dealer.



Specifications

	224/222	22	3BX Series Two	1BX Series Two	228	120
Channels	2* 2	2	2	2	2*	2
Effective Noise Reduction	30dB plus 10dB of recording headroom			30dB plus 10dB of recording headroom		
Expansion Ratio	1.0 to 1.5 (0 to 50%)			1.0 to 1.5 (0 to 50%)		
Dynamic Range	110dB	100dB	100dB	100dB	100dB	100dB
Tone Control Range	± 15dB boost/cut at 30Hz and 20kHz					
Input Impedance	100k ohms	47k ohms	50k ohms	50k ohms	50k ohms	47k ohms
Input Level (nominal)	300mV		300mV	300mV	300mV	300mV
Input Level (maximum)	6V RMS	1.5V RMS	7V RMS	7V RMS	7V RMS	7V RMS
Output Impedance	470 ohms	470 ohms	100 ohms	220 ohms	220 ohms	470 ohms
Output Level (maximum)	5.5V RMS	4V RMS	7V RMS	7V RMS	7V RMS	6V RMS
Frequency Response	40Hz to 20kHz ± 0.5dB	Conforms to dbx type II decoding curve, ± 0.5dB (30Hz - 20kHz), typical program material.	20Hz to 20kHz ± 0.5dB	40Hz to 20kHz ± 0.5dB -2dB at 20Hz to 40Hz	40Hz to 20kHz ± 0.5dB -2dB at 20Hz to 40Hz	25Hz to 20kHz ± 1dB
Equivalent Input Noise	-85dBV (unweighted)	-85dBV (unweighted)	-85dBV (unweighted)	-85dBV (unweighted)	-85dBV (unweighted)	-88dBV (unweighted)
Total Harmonic Distortion	0.1%	0.1% at 1kHz	0.1% at 1.0 expansion ratio	0.1% at 1.0 expansion ratio	0.1% at 1.0 expansion ratio	0.05%
I.M. Distortion (SMPTE)	0.2%		0.15%	0.15%	0.2%	0.1%
Connectors	RCA type phono connectors	RCA type phono connectors	RCA type phono connectors	RCA type phono connectors	RCA type phono connectors	RCA type phono connectors
Power Requirements	117/220V AC, 50/60Hz	12VDC (10.5V to 14V)	117/220V AC, 50/60Hz	117/220V AC, 50/60Hz	117/220V AC, 50/60Hz	117/220V AC, 50/60Hz
Power Line Consumption	7W (224), 5.5W (222)		30W	10W	10W	10W
Dimensions (W x H x D)	17-5/16" x 1-3/4" x 7-1/2"	6" x 1-3/4" x 5-3/4"	17-5/16" x 1-3/4" x 7-1/2"	17-5/16" x 1-3/4" x 7-1/2"	17-5/16" x 1-3/4" x 7-1/2"	17-5/16" x 1-3/4" x 7-1/2"
Weight	4-3/4 lbs.	1-1/2 lbs.	4-15/16 lbs	4-3/4 lbs	5-1/2 lbs	4-3/4 lbs

*224 and 228: Simultaneous Encode/Decode.

20/20

EQUALIZER	
Number of Bands	10
Bandwidth	Octave
Filter Type	Fixed frequency, two pole, symmetrical "peaker-dipper," digitally controlled
Center Frequencies	31.5, 63, 125, 250, 500, 1k, 2k, 4k, 8k, 16k Hz
Equalization Range	+14, -15dB, one band at maximum or minimum, all others centered
Resolution of Settings	1dB
Accuracy of Equalization	± 1dB at full boost or cut, ± 0.1/step
Max Input Level	+15dBV
Max Output Level	+15dBV
Output Noise	(all filters flat) < -80dBV "A" weighted
Gain	0dB
Input Impedance	47k ohms
Output Impedance	470 ohms

ANALYZER	
Filter Type	Fixed frequency, two pole bandpass, Q=2.5
Dynamic Range	80dB
Readout	30 LED x 10 band display, 1 light per band illuminated. 30dB range displayed at any one time
Input Sources	Line, Mic
Peak Hold	Holds the highest peak encountered until manually released
SPL METER	
Bandwidth	at 90dB SPL input, 15Hz to 20kHz
Dynamic Range	80dB
Detector Type	RMS
PINK NOISE GENERATOR	
Type	Digital pseudo-random white noise source, with analog filtering for -3dB/octave rolloff
Accuracy	Follows -3dB/octave curve over 20Hz to 20kHz within ± 0.5dB

MICROPHONE	
Type	Electret condenser, omnidirectional
Frequency Response	± 1dB, 20Hz-20kHz measured on an octave band basis (ISO centers), equalized via internal network in analyzer
Cable Length	25'
GENERAL	
Dimensions (W x H x D)	19" x 5-1/4" x 12-1/2"
Connectors	RCA type phono connectors
Power Line Requirements	117 VAC, 50/60Hz
Inputs	Main (from pre-amp tape output) Tape (from tape recorder output) Mic
Outputs	Main (to pre-amp tape input) Tape (to tape recorder inputs) Pink Noise
Batteries	2AA size alkaline required, supplied with unit

Design and specifications subject to change without notice for improvements. Manufactured under one or more of the following U.S. patents: 3,681,618; 3,714,462; 3,789,143; 4,101,849; 4,097,767. Other patents pending.

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