

TEAC A-7300RX

World's First 2-Track Master Recorder with dbx System



A-7300RX 2-Track

The TEAC A-7300RX is a self-contained recording studio. Housed in separate, heavy duty protective cases are a superb 2-track tape transport system and the most advanced electronics package ever created for a mastering deck.

If the A-7300RX was just another 2-track machine, you could spend a lot of time comparing it with others. But the A-7300RX is the first deck to incorporate the new dbx deci-linear noise reduction system. And with that, all comparisons end:

*Signal-to-noise ratio is well over 100 dB.

*Music with a Dynamic Range

of over 100 dB can be faithfully recorded.

*Noise Reduction is effective from 20Hz to 20 kHz.

*The tape saturation point is raised 10 dB.

We will try to describe the dbx system in some detail, as well as highlight some of the A-7300RX's other distinctive features. But the dbx difference must be heard. The total absence of noise – the dead silence between musical selections – is uncanny, unreal. The dynamic range of the music recordable is fantastic. Almost too real. And can be duplicated by no other recording process utilizing magnetic tape. We urge you to experience it soon.

The TEAC dbx system



In simple terms

The dbx system incorporated into the A-7300RX's preamplifier does not merely reduce noise. It actually increases the dynamic range of the source material that can be recorded on tape.

In a sense, it could be called an enhancement system, but we hesitate to use the word. Because enhancement implies alteration or change, and the dbx system does not alter the source material in any way.

It repackages it electronically to better fit the fixed parameters of the recording tape.

The dbx system includes pre-emphasis circuits, a Voltage Controlled Amplifier/Attenuator (VCA), an RMS Level Sensor, and special compensating weighting circuits. These elements work together, and are all necessary to achieve the spectacular results obtainable with the A-7300RX.

The problem

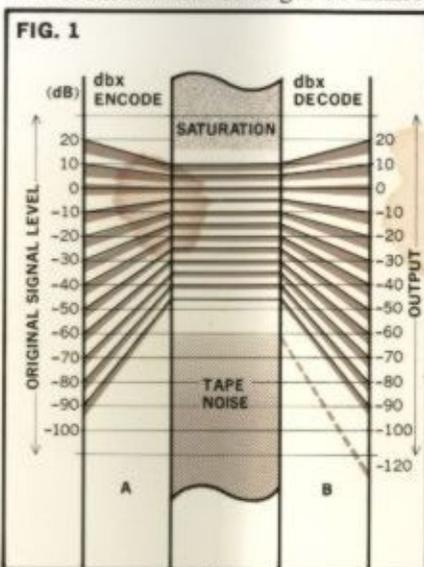
Live music has a tremendous dynamic range, often 100dB or more. Unfortunately, even the finest of modern tapes have a saturation point of approximately

+10dB on the high end, and noise, or tape hiss, clearly audible at about -50dB on the low end. So the tape limits us to a difference of about 60dB between the strongest and the most delicate sounds we can record.

In other words, like trying to put a gallon of water in a one-quart container, all the music simply cannot fit on the tape.

The solution

When something doesn't fit, there are only two possible answers: make the container larger or make



the substance you are trying to contain smaller.

Given the limits of modern tape technology, the latter solution was pursued.

During the recording process, with the dbx system switched to ENCODE, the dB values of the incoming signals are logarithmically condensed – or compressed – in a perfect 2:1 ratio. They are electronically divided by two, so that -80dB becomes -40dB, and +20dB becomes +10dB. This means that even live music with a dynamic range of 100dB can 'fit' onto recording tape that ordinarily would allow only 50dB. (See fig. 1-A)

During playback, with the dbx system switched to DECODE, all signals from the tape – including the tape noise – must pass through the dbx system.

And, just as a signal of -30dB is reduced to its original level of -60dB, tape noise at about -60dB is reduced to an inaudible -120dB.

(See fig. 1-B) Therefore, the result of using the dbx system is a great improvement in the dynamic range of our recordings. Indeed, the entire dynamic range of a live performance can be captured. In addition, during the decoding process noise is so greatly reduced that it is virtually inaudible.

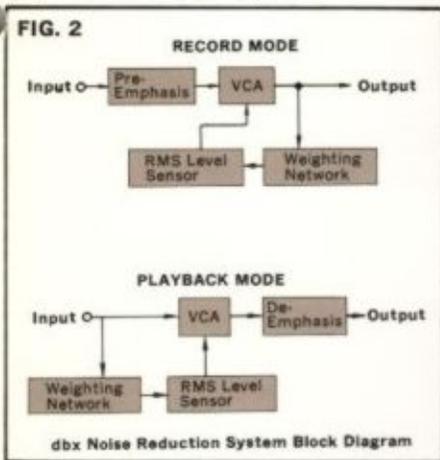
dbx* Master Rec

For the technically-minded

The dbx system should not be confused with simple noise reduction systems. Its primary function is to increase the dynamic range of the music recordable on tape, and noise reduction is an important part of that process.

The block diagram below represents the dbx system:

FIG. 2



The input signal is sent to the pre-emphasis network first. The high frequency pre-emphasis before the encoder and subsequent de-emphasis after decoding adds 10dB of noise reduction at high frequencies even at louder levels.

After pre-emphasis, the signal is fed to the VCA where the actual 2:1 compression of the program's dynamic range takes place.

The gain of the VCA is controlled by the RMS Level Sensor.

The RMS sensor generates a DC voltage that is proportionate to the incoming signal and controls the amplitude of the VCA unit.

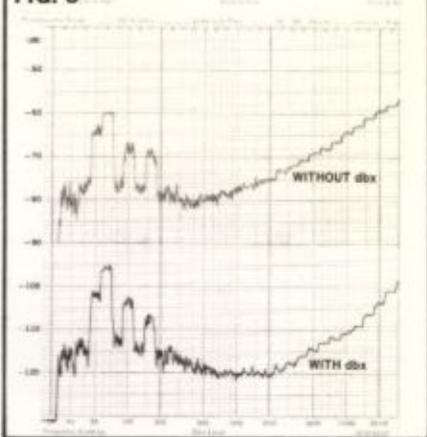
The RMS Sensor detects the root-mean-square level of the signals, unlike peak or average sensors.

It cannot be confused or influenced by phase errors, even if different transports are used for the

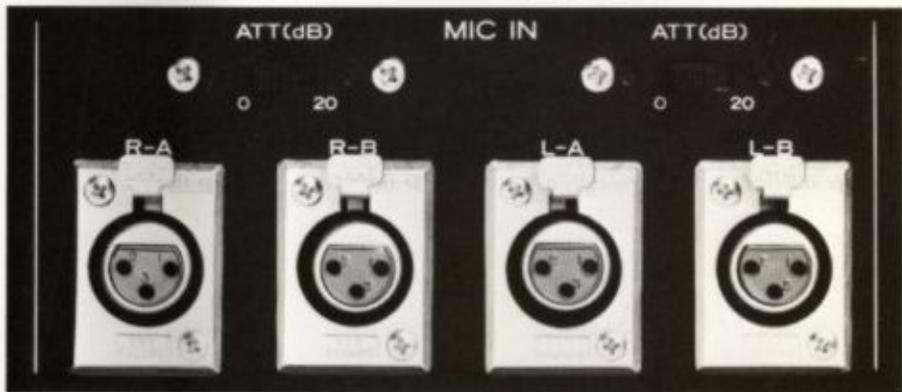
encoding and decoding processes. It can respond to differences as great as 140dB or more, and can sense the true RMS value of all audible frequencies above 20Hz. Weighting networks in the dbx system vary the sensitivity of the RMS Level Sensor to prevent high frequency signals from saturating the tape. During the encoding process, high frequency sensitivity is raised to decrease the amplitude of the VCA and record the signal below the saturation level of the tape.

When dbx encoded tapes are played back, reverse weighting is employed, and the RMS Level Sensor controls the VCA unit so that all signals are restored to their original levels. Since all signals from the tape are affected, the noise on the tape is greatly

FIG. 3



reduced during this process, as shown on the graph in fig. 3. Finally, the restored signals are passed through the de-emphasis network and through the A-7300RX's output circuitry, where the full dynamic range of the original music is available.



Order.



Advanced electronics

A built-in 4-in, 2-out mixer means you'll have to carry less with you when recording smaller groups in the field. Three or four mikes and the A-7300RX and you're in business. Cannon-type connectors with 20dB mic. attenuators for each pair of mikes simplify set-up and mike placement. And a master level control allows you to balance mikes individually and then adjust the overall recording level. Dual scale VU meters read either to +3 VU or +6 VU, and three-position Bias and EQ switches allow you to match the characteristics of the preamplifier to the tape you are using.

The transport

From the direct-drive, two-speed DC servomotor that drives the tape past the heads, to the Cue and Edit buttons that simplify tape handling, the transport system of the A-7300RX is strictly professional in design. And was built with the ruggedness and assured reliability you expect in a machine of this type.

IC logic controls

The lightest pressure is all that's required to activate the transport controls. But even if two or more buttons are depressed at once — together or in any sequence, with the tape moving or not — there is absolutely no danger of tape spill or breakage. The IC Logic Circuits

that control the reel motors and the entire transport system just won't allow it. All transport functions can be controlled from up to 16 feet away with the optional RC-170 Remote Control Unit.

TEAC high density Permaflux heads

The 2-track heads used in the A-7300RX are our own High Density Permaflux Heads, manufactured to the highest standards and individually designed to yield the highest performance possible with any tape. A handy hinged cover makes it easy to get to the heads for cleaning and demagnetizing, and facilitates marking the tape for editing.

Pitch control

For special effects and "tuning" recorded instruments, the pitch control allows you to vary tape speed by $\pm 5\%$, but in no way interferes with the electronically controlled servomotor unless activated.



Edit button

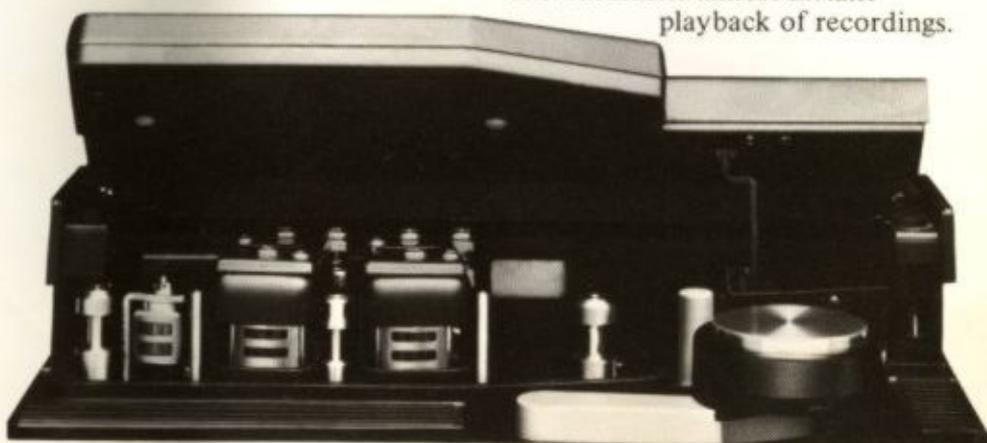
A touch of the Edit button defeats the take-up reel motor, allowing you to run unwanted tape directly into the wastebasket. This button can only be engaged when the transport is in the Play mode.

Elapsed time counter with memory

An extremely accurate Elapsed Time Counter, calibrated for 15 ips. tape speed, indicates minutes and seconds in all transport modes. This counter may be reset



to zero at any point on the tape. With the special Memory system engaged, the transport will automatically stop at this zero point when running in the Rewind mode. This is a very handy device as it facilitates almost instant playback of recordings.



**dbx' is a trademark of dbx Incorporated.



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Useful accessories

A wide range of superb TEAC accessories and additional equipment is available. Everything for superior tape recording. The Model 2 Mixer shown is a 6-in, 4-out unit with individual pan pot controls, high and low cut filters, and mic. attenuation for each input. Measuring just 3¼" x 13¼" x 10¼" and weighing only 15 lbs., it is the ideal companion to our A-7300RX machine.



Model 2 Audio Mixer



TZ-261 Cleaner Kit



E-3
Head Demagnetizer



A-7300RX Specifications

Track System: 1/2-Track, Two-Channel Stereo or Mono
3 Heads: Erase, Record and Playback
3 Motors: 1 Direct-Drive DC Servo Capstan Motor;
 2 Eddy Current Induction Reel Motors
Reel Size: 10½" and 7"
Tape Speed: 15 ips and 7½ ips (±0.5%)
Wow and Flutter (NAB Weighted): 0.04% at 15 ips
 0.05% at 7½ ips
Frequency Response (Overall):
 25-30k Hz (±3dB: 30-28k Hz) at 15 ips,
 25-28k Hz (±3dB: 30-24k Hz) at 7½ ips
Signal-to-Noise Ratio (Overall): 100dB with dbx;
 65dB without dbx
Harmonic Distortion (Overall): 0.4% with dbx;
 0.8% without dbx, at 1k Hz normal operating level
Stereo Channel Separation: 80dB with dbx;
 50dB without dbx, at 1k Hz
Rewind/Fast Forward Time: 150 seconds for 1,800 feet

Inputs: 4 Line: 100mV/impedance: 50k Ohms
 4 Mic: 0.25mV (-72dB)/impedance: 600 Ohms
Outputs: 2 Line: 0.3V/load impedance: 10k Ohms
 1 Stereo Headphone Jack: 8 Ohms
Counter Accuracy: Better than ±1.5% at 15 ips Play mode
Power Requirement: 100/117/220/240V AC, 50/60Hz, 83W
Dimensions (WHD):
 Transport: 470 x 455 x 300mm [18½" x 17¾" x 11¾"]
 Amplifier: 470 x 205 x 310mm [18½" x 8¼" x 12¼"]
Weight: Transport: 28kg [61¾ lbs], net
 Amplifier: 13kg [28½ lbs], net
Supplied Accessories: Empty Reel (10½", RE-1002)
 Hub Adapters, Input-Output Connection Cords,
 Transport-Amplifier Connection Cords, AC Power Cord,
 Splicing Tape, Cleaning Stick

*Specifications were determined using low noise high output tape.
 *Changes in specifications and features may be made without notice.

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