

**5.2.4 The two systems: dbx Type I and dbx Type II**

The original dbx Type I noise reduction system was developed for use in professional recording studios. In response to the demands of consumers and small studios, dbx introduced a variety of Type I units — the 150 series. These units utilize the same signal processing as other Type I professional recording studio models, including the 180, and tapes made with one system may be decoded with the other.

Broadcasters have recognized the potential for improved signal quality which could be obtained if they were to use dbx processing. However, broadcast cartridges and telephone transmission lines do not offer the excellent frequency response available in professional recorders and better hi-fi tape machines; the low end and high end of the spectrum often fall off considerably. This poor frequency response can cause mistracking of the dbx Type I system. Therefore, the dbx II system was developed, represented by dbx consumer models in the 20, 120 and 220 series and the professional 140 series. The basic principle of operation of the two systems is identical, and the amount of noise reduction is the same, yet the two systems, dbx Type I and dbx II, are not compatible. A tape encoded with either system cannot be decoded by the other. Similarly, a dbx encoded disc (see below) cannot be decoded with the dbx Type I system, since it was mastered with the dbx Type II system.

The two systems were optimized for different applications. The Type I system was designed for use with tape machines which have good wide-band frequency response (generally within  $\pm 1$  dB, 30 Hz to 20 kHz) and which are typically used at 15 ips or greater speeds. The RMS pre-emphasis circuitry was engineered to take advantage of the headroom available when using high-speed record equalization. The Type II system was developed to provide dbx noise reduction for use with storage and transmission media having a more restricted bandwidth and less available headroom. These include cart machines, telephone lines, STLs, cassette machines and vinyl phonograph records. The highpass filter in the signal path in the dbx Type II system is slightly more restrictive, rolling off 1 dB at 24 Hz. In addition, the RMS detection circuitry in dbx Type II units is sensitive only up to 10 kHz, so high frequency losses on the tape or in the transmission lines will not create encode/decode mistracking. The frequency response of dbx Type II processing does not restrict the bandwidth of the audio signal itself.

Both systems offer the same 30 dB of broadband noise reduction, and a 10 dB improvement in headroom for tape recordings. The differences in the

detector characteristics between dbx Type I and dbx II processing make it inadvisable to encode with one system and decode with the other because mistracking will occur on many types of program material.

The dbx Type II system is equipped with a NORM/DISC switch that introduces a further low end rolloff ( $-3$  dB at 21 Hz) in DISC mode. This has been provided to permit decoding of special dbx-encoded phonograph records; the rolloff protects the RMS detection from mistracking due to record warp or turntable rumble.

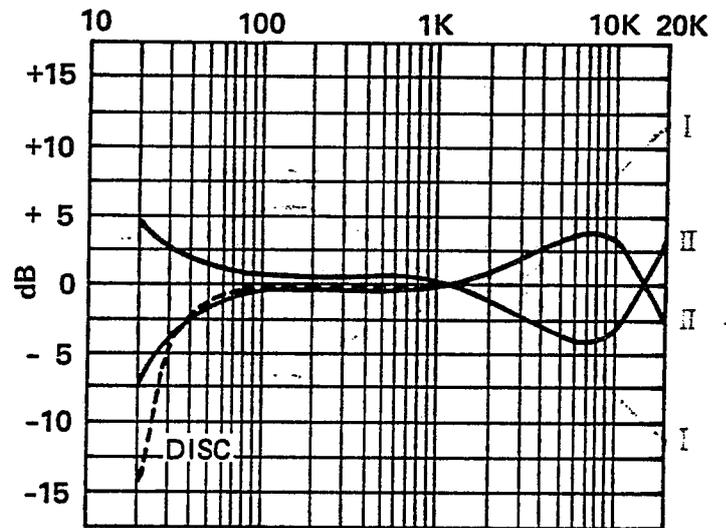


Fig. 5-4 — Type I vs. Type II Encode/Decode Curves (Sine Wave Sweep)  
NOTE: Encode curve's vertical scale is corrected for the 2:1 compression factor.