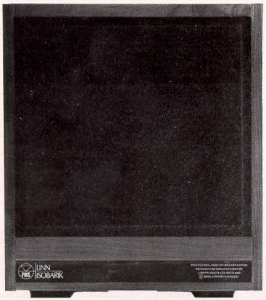

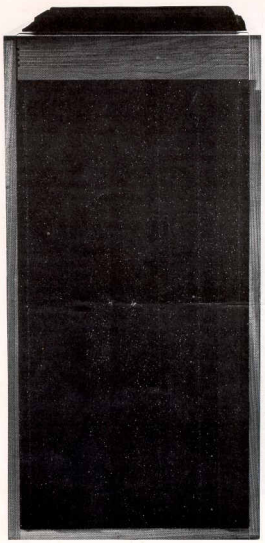

Linn DMS Isobarik Loudspeaker

The Linn DMS (Domestic Monitor Speaker) is a three-way system with crossover points at 375Hz and 3000Hz. The DMS measures 15" x 16½" x 30" and employs six individual drive units. The three forward facing drivers consist of a dome tweeter, a midrange (mounted in a terminated transmission line), and a 9" x 13" woofer. To insure a smooth off axis response, a second tweeter and midrange (again in its own terminated transmission line) are mounted on the top surface of the enclosure. The remaining driver, a woofer, is mounted internally as part of the Isobarik loading system.

Isobarik loading employs the second woofer operating inside the sealed enclosure to maintain a region of constant or "equal pressure" in a cavity between the two drivers (hence the name Isobarik). This control of the internal pressure extends the low frequency response of the system by allowing the external woofer to perform as if it were in a much larger enclosure. In addition to being mechanically coupled by the enclosure, the bass drivers are electronically linked through a unique dual crossover system that allows the inside driver to generate an error correction signal that further reduces driver induced distortions. This method of loading results in distortion figures for the bass unit approximating those normally associated with high quality midrange units.

The DMS is capable of producing high sound pressure levels without undue distress across the entire audio spectrum. Frequency response varies by only a few db from 20Hz to 20KHz with the Isobarik loading extending usable bass response to below 10Hz. The audible advantages of extended bass response can only be appreciated when you realize that every musical signal starts at DC. The leading edge of every signal appears as a DC signal. The better the very low frequency response of the speaker, the more accurately it can reproduce the leading edge of musical signals at any frequency.

The single most important concept behind the design of the DMS is Instantaneous Dynamic Range (IDR). IDR differs significantly from the usual concept of dynamic range. When you think of the dynamic range of a speaker, you generally think of it as being a measurement of the difference between the lowest level signal it can reproduce and the loudest. The fallacy behind this view of dynamic range is that, in music, the speaker is called upon to reproduce musical peaks and low level signals **at the same time**; hence our terminology **Instantaneous** Dynamic Range. With IDR, we are concerned with the speaker's performance on a low level signal while it is

being stressed by a high level signal.

An example will illustrate the importance of this concept. If we feed a 90db (loud) signal into a typical midrange driver, it will most likely reproduce it with little or no problems. We turn off that signal and try a 30db (quiet) test tone at a slightly different frequency. Again, no problems. But, try reproducing both signals at the same time. If we monitor the output of the speaker and filter out the 90db signal, leaving only the 30db signal, we are likely to find that our low level signal is distorted beyond recognition.

The reason for this unexpected distortion is the reaction of the speaker to the high level signal. From high school physics we know that for every action there is an equal and opposite reaction. Every time our high level signal caused the cone of the speaker to move in one direction, the metal basket supporting the magnetic structure of the speaker and the front panel of the speaker enclosure tried to move in the opposite direction. Granted, these parts are much more massive than the cone and their movement will be quite small compared to that of the light weight cone. If our high level signal is causing the cone to move a quarter inch, the basket may only move a few ten thousandths of an inch, hardly significant. Hardly significant, that is, if all that we are concerned with is the reproduction of the high level signal. To reproduce our low level (30db) signal our cone need only move 0.00025". Now, the unwanted movement of the metal basket caused by the high level signal becomes quite significant. Under the circumstances, it is hardly surprising that the low level signal is grossly distorted.

In the design of the DMS great care has been taken to insure that stress caused by high level signals would have a minimal effect on the reproduction low level material. Drivers have been rebuilt using stronger materials, the metal baskets are treated to reduce the effects of vibration, and the enclosure was very carefully designed and constructed.

Included in the design of the enclosure is an arrangement of stressed steel rods. The concept behind the use of the rods is that it is much easier to control energy than to destroy it. We are faced with the problem of unwanted energy causing movement in the metal speaker basket and front panel of the enclosure. We could simply increase the mass of the parts in question. As the mass approached infinity, the unwanted movement would approach zero. That is a rather expensive and impractical solution. A simpler (and much more elegant) solution is to provide a lower resistance path for the energy to follow. Faced with a choice between flexing the rigid speaker basket or traveling down the steel rod, most of the energy follows the path of least resistance down the steel rod into the interior of the enclosure. If you will recall, the DMS employs a set of upward facing drivers. The same stressed steel rod technique is employed to control the unwanted energy in those drivers. That energy is also channeled into the interior of the enclosure. The design of the cabinet is such that the energy that would have caused the unwanted motion of the front panel and drivers is directly opposed by a similar energy from the upward facing units and no movement takes place.

The techniques employed in the design and construction of the DMS result in a loudspeaker that has capabilities far exceeding those of other speakers. However, it should be pointed out that the performance of the speaker will be limited by the quality of the signal that is provided by the rest of the system; i.e., if your turntable can not retrieve the information from the record, it makes very little difference if the speaker can reproduce it. This being the case, we recommend that the DMS be used only in systems containing the Linn turntable and very high quality electronics. In the case of electronics, the quality of the signal is far more important than the power of the amplifier. Depending on volume levels desired, the DMS can be adequately driven with amplifiers rated at from 40 to 70 watts RMS. (Up to 500 watts per channel may be utilized on program material.) However, it is essential that the amplifier be capable of delivering its rated output from very low frequencies without intermodulation, transient intermodulation, or slewing induced distortion problems. These problems, which other speakers may not be capable of reproducing, will be quite audible through the DMS.

Those wishing even higher standards of musical reproduction should consider the Linn PMS (Professional Monitor Speaker). The PMS is a tri-amplified version of the DMS and is designed to be used with special electronics manufactured by Naim Audio, Ltd.

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