ADS L710 · L810

"The ADS L810 was one of the very few speakers we have tested in the past ten years or so that was so accurate that we could not distinguish its sound from the original in a side-by-side comparison."

— Julian Hirsch on the "original" ADS L810, from his equipment test report appearing in Stereo Review, *January, 1978.**

State-of-the-art then, and state-of-the-art now

In this age of planned obsolescence it is rare that one finds a product of truly lasting value and timeless quality. This seems particularly true of audio products because of the industry's rapidly advancing technology and growing sophistication. It is against such a history of rapid change that the ADS L710 and L810 speakers have impressively endured and emerged as true classics.

Make no mistake — the latest versions of the L710 and L810 are notably different from their immediate predecessors. Like all great innovations, the L710 and L810 have changed, quietly and carefully, through a process of evolution. Comparing an early ADS L810 to its most modern counterpart reveals differences, both sonic and cosmetic, which are more accurately characterized as refinements than radical improvements. The L710 and L810 are living proof that a fundamentally correct design has no age and needs only be invented once — the first time.

The superb performance, which Julian Hirsch and others so clearly documented several years ago, has thus been critically refined and lives on today in the modern L710 and L810. A close look at these speakers reveals technology so advanced that they defy successful imitation. And yet, they are unmistakably the L710 and L810, . . . and unmistakably ADS.

The Drivers

ADS manufactures all of the drivers used in its speakers. This fact alone distinguishes ADS from a large majority of speaker system manufacturers, who must purchase most or all of their drivers from bulk suppliers. ADS thus maintains total control over system matching, quality and engineering improvements. Proper design and manufacture of the drivers obviate the need for highly complex, efficiency-robbing crossover networks typical of many "sophisticated" speaker systems which represent nothing more than valiant attempts to match inherently incompatible drivers. Each ADS driver, furthermore, embodies the most advanced design, materials and manufacturing techniques in the industry.

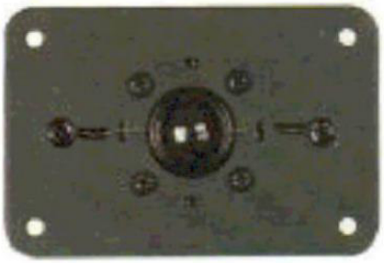
The Tweeter

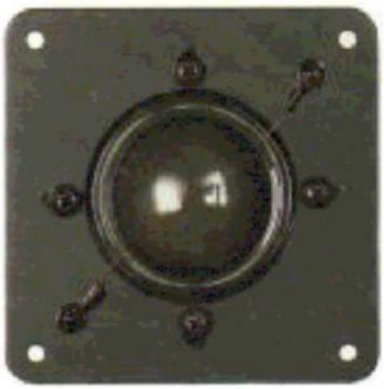
The frequently praised "airy" high-frequency response of the L710 and L810 is the work of ADS' now-famous ¾-inch acoustic suspension soft-dome tweeter. This unit's exceptionally small diameter and special construction results in high-frequency extension and wide, uniform dispersion unmatched by other designs. The dome is constructed of a super-light fabric-like material coated with a proprietary "sticky" damping compound. It has none of the "ringing" and other resonance-related distortions common to other materials. Soft to the touch, the tweeter nonetheless functions as a perfectly stiff piston through its operating range, thus ensuring low distortion and coloration.

The tweeter's voice coil features a sophisticated and unusual single-layer winding. (Most similar tweeters must use two layers of windings in their voice coils to achieve the required number of turns.) This permits use of an extremely narrow gap in the magnet/pole-piece structure. Although difficult to execute, this technique yields an incredibly high force-to-mass ratio through lowered moving mass and increased magnetic flux density. (Halving the magnetic gap *quadruples* the effective field strength!) Further aided by a powerful Barium Ferrite magnet, which develops 18,000 Gauss of flux density at the voice coil, the ADS ¾" tweeter delivers superb high-frequency extension, excellent transient response, extremely low distortion and high efficiency.

The all-metal voice coil structure is a high-thermal-conductivity design which is unsurpassed in dissipating heat. The narrow-gap magnet structure, moreover, promotes efficient thermal transfer for highly effective cooling of the voice coil during high-current drive. This "air-cooled" voice coil structure can only be achieved through high-precision assembly, and it is more efficient and stable with time than "liquid-cooled", ferrofluid-filled systems. It should not be surprising, therefore, that very few tweeters, including those with voice coils of larger diameter, can handle as much power as the ADS ¾-inch soft-dome tweeter.

All ADS soft-dome tweeters, furthermore, feature airtight cavities behind the diaphragm. In effect an independent miniature air suspension system, the tweeter enjoys total acoustic isolation and, equally important, a highly linear diaphragm restoring force which does not deteriorate with age.





The Acoustic Suspension Midrange

The L710 and L810 share one of the most impressive midrange drivers ever produced, the 2-inch ADS soft-dome unit. Like the ¾-inch soft-dome tweeter, the ADS dome midrange features an ultra-lightweight damped diaphragm, a powerful magnet assembly, a single-layer high-thermal-conductivity metal voice coil, narrow gap construction and acoustic suspension loading. Unlike conventional cone drivers, ADS' soft-dome midrange boasts extremely wide and uniform dispersion throughout the musically critical midrange frequencies.

This advanced midrange driver is capable of resolving very fine detail with high efficiency and extremely low distortion. Also coated with ADS' proprietary damping compound, the soft-dome is totally free of spurious resonances, which frequently occur in other designs and cause sonic "smearing" and coloration. The driver's neutrality and transparency is evident in its uncannily accurate reproduction of difficult midrange material, such as human voice, piano and reed instruments. The highly coherent wavefront produced by the dome geometry further ensures stable and precise stereo imaging.

The Dual Woofer Bass System

Utilizing ADS' famed dual-woofer/dual-chamber system, the L710 and L810 boast bass performance unmatched even by considerably larger speakers. Each L710 has two 7-inch diameter woofers loaded by physically separate acoustic suspension chambers. The L810, similarly, has two 8-inch diameter woofers. The dual woofers effectively act as a single piston with diameters of 10 inches and 12 inches, respectively. But together, they are faster, better damped and handle more power than other high-fidelity bass systems of equivalent piston area. Such prodigious bass performance is largely the result of ADS' demonstrably superior driver technology.

ADS woofers feature cones made of a unique material known as *Stifflite*. An unusually thick material (formed of air-filled, spacially-oriented pulp fiber in a proprietary "sandwich" construction), *Stifflite* has high structural rigidity (a consequence of its thickness) and very low mass (because much of its bulk is air). The *Stifflite* structure also damps unwanted resonances to an unprecedented degree. (You can prove it to yourself by tapping an ADS woofer cone with the eraser-end of a pencil. A properly designed cone should emit dull thuds rather than sharp, "live" sounds.) The ADS *Stifflite* woofer cone thus satisfies three crucial design parameters better than any other cone material known. It has low mass, an essential ingredient for well-damped, hangover-free bass. It is also "dead" — it has high internal damping — and does not impart its own character to the reproduced sound. And, finally, it is *incredibly* stiff, a "must" for minimizing distortions caused by cone "break-up" and other non-piston-like behavior.

Coupled to each cone are a low-mass high-temperature metal voice coil at one end, and a highly flexible and uniform rubber surround at the other. The high-density voice coil features two layers of windings (where most other woofers use four), and it is precision-aligned into a deep, narrow magnetic gap. The result is an exceptionally light moving system (less than 25 grams — a figure lower than the mass of many competing voice coils *alone*) with excellent thermal transfer characteristics. The woofer suspension components are manufactured and aligned to tolerances unheard of in the industry. The bass drivers of the L710 and L810 are thus capable of extremely long, linear excursion. Their powerful Barium Ferrite magnets and their low moving mass ensure high efficiency and damping. They have exceptional power handling capability thanks to their high-thermal-conductivity voice coil assemblies. The bass system's efficiency and power-handling are key to the speakers' generous dynamic range.

The Crossover Network

Many speakers have crossover networks with numerous power-robbing, distortion-inducing components, which are needed to correct driver performance anomalies and match grossly different driver efficiencies. ADS' networks, thanks to ADS' advanced driver technology, avoid excessive complexity and have the lowest power loss and distortion figures in the industry.

The crossover characteristics and frequencies for the newest L710 and L810 systems have been selected through computer analysis, exhaustive acoustic measurements and extensive auditioning. The network components, furthermore, are of the finest quality. All critical capacitors, for example, are

computer-grade metalized polyester-film. Bass section inductors are heavily "over-designed" with extra-heavy-gauge copper wire and special low saturation, low dynamic distortion ferrite cores. All mid- and high-frequency inductors are air-core designs. The coils, as a result, are extremely linear over the system's operating range and have the lowest measured DC resistance among modern production loudspeakers. The crossover networks of the L710 and L810 thus provide seamless transition from driver to driver with maximum damping and minimum distortion throughout the speakers' entire frequency and dynamic range.

Advanced Acoustic Suspension Design

All enclosed ADS speakers employ the acoustic (air) suspension principle for two basic reasons. First, it is ADS' belief that a properly designed acoustic suspension system offers the best, most consistent bass performance for a given size and cost, for the widest range of applications. Second, since acoustic suspension provides a highly linear diaphragm restoring force (trapped air) which is not dependent on the mechanical suspension of the driver, it delivers the most stable performance over years of use.

ADS' acoustic suspension designs, however, go far beyond these basic considerations. ADS' superior drivers and networks ensure the highest system efficiency. The L710 and L810 are demonstrably more efficient than other acoustic suspension systems of comparable bass performance. Surprisingly, they are also more efficient than most bass reflex systems of comparable internal volume and bandwidth, even though theory dictates the reverse. (Most bass reflex systems lose their theoretical efficiency advantage to non optimum drivers and/or networks.) This enables the L710 and L810 to be driven to startling sound levels with amplifiers as small as 15 Watts per channel. ADS acoustic suspension design, furthermore, ensures maximum bass accuracy and extension. All parameters are carefully chosen to maximize system damping and provide a smooth, gradual bass rolloff. Unlike "one-note" boom boxes which may initially impress the unseasoned listener, the L710 and L810 produce bass of substance and subtlety, appreciation and enjoyment of which can only grow over years of ownership.

The Enclosure

The L710/L810 cabinetry is a supreme example of ADS' attention to detail. The enclosures are internally divided into two chambers and are precision-constructed from ¾-inch extra-high-density particle board. This construction provides the mass, rigidity and acoustical properties necessary to keep sonic coloration to an absolute minimum. They are beautifully finished in finest grade select natural walnut. The edges are reinforced by radiused solid walnut inserts. The drivers are carefully flush-mounted onto the piano-finish front baffle to minimize surface diffraction effects; they are asymmetrically positioned on the baffle to ensure that cabinet-edge diffraction is randomly scattered for minimal interference. The curved metal grille is acoustically transparent, and it eliminates the need for frames and supports, which cause further diffractive interference in conventional grille designs. ADS thus achieves remarkably diffraction-free performance in the L710 and L810 without resorting to unusual, and frequently unsightly, cabinet shapes. The lack of diffractive interference gives these speakers an open, "unboxed" sound quality and pinpoint-accurate stereo imaging, characteristics unusual in bookshelf speaker systems.

Tweeter Protection

Since the tweeter is the most likely driver to be damaged by amplifier misbehavior (including clipping and oscillating) or abuse, the L710 and L810 have tweeter protection fuses located in special compartments on their rear panels. Spare fuses are included in these compartments for convenience.

Ageless Value

The L710 and L810 offer a rare degree of quality and performance. Indeed, the market overflows with larger, costlier speakers that cannot equal their tonal accuracy, wide frequency range, low distortion, high efficiency, excellent stereo imaging, superb transient response and wide dynamic range. Having already withstood the stringent test of time, they are among but a handful of modern loudspeakers which will not become obsolete with continuing improvements in program material quality. Timeless design, no-compromise manufacture and proven performance make the ADS L710 and L810 exceptional values. They could well be among the best long-term investments you can make today.

SPECIFICATIONS

ADS L710
3-Way Speaker System

Frequency Response
40-23,000 Hz ± 3 dB
25-30,000 Hz ± 5 dB

Impedance
6 Ohms nominal, 4 Ohms minimum

Efficiency
93 dB SPL with 2.8V RMS [1 Watt] pink noise input measured at 1 meter in typical listening room (2000 ft³)

Driver Complement
One acoustic suspension soft-dome tweeter, ¾-inch diameter, with single-layer, high-temperature metal voice coil
magnetic flux density: 1.8 Teslas (18,000 Gauss)
magnetic flux: 325,000 nanoWebers
One acoustic suspension soft-dome midrange driver, 2" diameter, with single-layer, high-temperature metal voice coil
magnetic flux density: 1.55 Teslas (15,500 Gauss)
magnetic flux: 1,450,000 nanoWebers
Two long-excursion, high-compliance woofers, 7" diameter, with 1" high-temperature voice coils and tapered Stiffile cones
magnetic flux density: 0.85 Teslas (8,500 Gauss)
magnetic flux: 500,000 nanoWebers

Crossover
12 dB/octave at 550 Hz and 4,000 Hz

Power Rating
75 Watts nominal
150 Watts max. peak program

Recommended Amplifier Power
15 Watts minimum, 150 Watts maximum

Dimensions
21⅝" (H) x 12¼" (W) x 10½" (D)

Approximate Weight
35 lb./16 kg. net

Cabinet
Select natural walnut over extra-high-density particle board, solid walnut edge inserts

Baffle
Piano black finish with diffraction-corrected flush driver mounting

Grille
Acoustically transparent removable frameless grill in bronze finish

Optional Accessory
ADS F-700 black metal base

ADS L810
3-Way Speaker System

Frequency Response
35-23,000 Hz ± 3 dB
20-30,000 Hz ± 5 dB

Impedance
6 Ohms nominal, 4 Ohms minimum

Efficiency
94 dB SPL with 2.8V RMS ("1 Watt") pink noise input measured at 1 meter in typical listening room (2000 ft³)

Driver Complement
One acoustic suspension soft-dome tweeter, ¾" diameter, with single-layer, high-temperature metal voice coil
magnetic flux density: 1.8 Teslas (18,000 Gauss)
magnetic flux: 325,000 nanoWebers
One acoustic suspension soft-dome midrange driver, 2" diameter, with single-layer, high-temperature metal voice coil
magnetic flux density: 1.55 Teslas (15,500 Gauss)
magnetic flux: 1,350,000 nanoWebers
Two long-excursion, high-compliance woofers, 8" diameter, with 1" high-temperature voice coils and tapered Stiffile cones
magnetic flux density: 0.85 Teslas (8,500 Gauss)
magnetic flux: 500,000 nanoWebers

Crossover
12 dB/octave at 550 Hz and 4,000 Hz

Power Rating
100 Watts nominal
200 Watts max. peak program

Recommended Amplifier Power
20 Watts minimum, 200 Watts maximum

Dimensions
25½" (H) x 14⅛" (W) x 11⅜" (D)

Approximate Weight
46 lb./21 kg. net

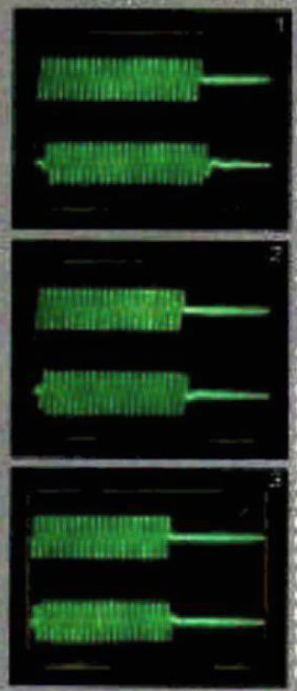
Cabinet
Select natural walnut over extra-high-density particle board, solid walnut edge inserts

Baffle
Piano black finish with diffraction-corrected flush driver mounting

Grille
Acoustically transparent removable frameless grill in bronze finish

Optional Accessory
ADS F-800 black metal base

TYPICAL PERFORMANCE



1. Tone burst response of L810 high-frequency driver at 10 kHz.

2. Tone burst response of L810 midrange driver at 2 kHz.

3. Tone burst response of L810 bass driver at 200 Hz.

All tone bursts are actual oscilloscope photographs. In each frame, the top trace represents the input to the L810, and the bottom trace is the measured output. All measurements are of the entire speaker system with drivers mounted in cabinet and receiving test signal through crossover network. Excellent tone burst response over entire range ensures faithful reproduction of musical detail.

Who is ADS?

Analog & Digital Systems is an expanding young high-technology American company with roots in European craftsmanship and esthetic sensitivity. We are dedicated to innovation and leadership, but not technological novelty for its own sake. At ADS, advanced technology is always at the service of musical enjoyment, and it is firmly grounded in the sciences of physics, chemistry and acoustics. Over the years, ADS products have consistently received high critical acclaim and won coveted design and engineering awards. ADS' wide range of contributions to high-fidelity have included innovative consumer products, such as the famous ADS 2001 miniature bi-amplified mobile speaker system, and large professional monitoring systems, which have been selected by some of the world's most respected recording and broadcast studios. ADS technology today extends to a complete line of home and professional speakers, bi-amplification and modular systems, ambience synthesis (digital delay) systems and automotive audio products. The L710 and L810 are classic examples of ADS' engineering excellence in pursuit of better music reproduction.

ADS **Where technology serves music**

Analog & Digital Systems, Inc., One Progress Way, Wilmington, MA 01887 (617) 658-5100

ADS 9/81 25M Printed in U.S.A.