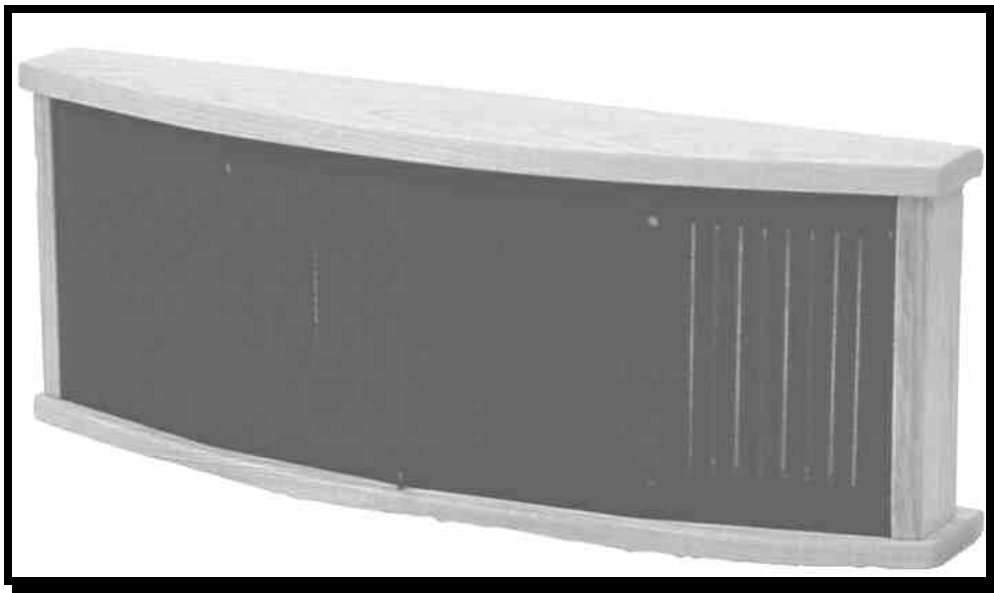


**EMINENT
TECHNOLOGY
INCORPORATED**

LFT XII

CENTER CHANNEL LOUDSPEAKER



REFERENCE MANUAL

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THE LFT-12 PLANAR MAGNETIC CENTER CHANNEL LOUDSPEAKER

Congratulations on your purchase of the Eminent Technology LFT-12! The LFT-12 is the most advanced planar magnetic loudspeaker technology available. With proper care and use, the LFT-12 will last many years. To get the most out of your LFT-12, please read this manual carefully. Do not forget to fill out the warranty form in the back of the manual and send it in to us for registration of your purchase.

ABOUT THE LFT-12

This loudspeaker is not for every application because of its limited maximum sound pressure level and low to moderate sensitivity. When using this loudspeaker, these limitations should be carefully considered. The loudspeaker is designed to operate in rooms of less than 3500 cubic feet. This is a rough estimate as there are many variables that would affect this figure. Operated full range, the loudspeaker is intended for use at low to moderate (95dB SPL maximum) sound pressure levels. The maximum recommended SPL is 103 dB at 1 meter.

UNPACKING

The shipping box contains a Manual (this document), and the LFT-12 Center Channel Loudspeaker wrapped in bubble wrap. Be careful when lifting the loudspeaker from the carton, it weighs approximately 20 pounds.

SETTING UP THE LFT-12

The LFT-12 is magnetically shielded and is intended for use in a home theater setting. It can be placed on top or below a television, or it can be wall-mounted. Typically, the optimum distance between the LFT-12 and the rear wall is 1 to 5 feet in an average room. The overall tonal balance and image presentation of the loudspeaker is affected by how it is aimed at the listener. The on-axis frequency response of the LFT-12 is essentially flat, and it is often best to position the loudspeaker so that the main listening position is on axis with the loudspeaker. For optimum sound quality, the loudspeaker should be no more than 7 feet from the listening position.

MOUNTING INSTRUCTIONS

For best performance, mount the LFT-12 on a shelf above or below the video screen. This mounting position will best anchor dialog to the screen and give the best three-dimensional acoustic projection. In some cases, where the screen is a large tube or projection television, the loudspeaker can be mounted on top of the television and angled toward the listening position using the pointed feet installed in the base of the loudspeaker. The loudspeaker is magnetically shielded and should have little interference on the picture quality.

Most mounting schemes will place the LFT-12 in an area where the wall behind the loudspeaker is acoustically reflective. To get the best tonal balance from the loudspeaker, we suggest experimenting with sound absorbent material on the wall behind the loudspeaker. Open cell foam and carpet are good choices as sound absorbers.

Wall mounting is also possible for the LFT-12. Although the bass response will be best when the loudspeaker is separated from the wall by at least one foot, good performance can be achieved with less space between the mounting wall and the LFT-12. When wall mounting we suggest attaching metal brackets or wall mount loudspeaker stands. Any hinge or wall attachment method should be capable of handling the loudspeaker's weight, 20 pounds, with a good safety margin. We again recommend experimenting with sound absorbent material on the wall behind the loudspeaker

AMPLIFIER REQUIREMENTS AND SENSITIVITY

Almost any audio amplifier can be used with the LFT-12. The minimum recommended amplifier power rating is 35 watts RMS per channel for moderate listening levels. Amplifiers up to 150 watts per channel can be used but this much power could over drive the speaker in the full range mode. The amplifier should be capable of driving a four-ohm load. Through a narrow part of the speaker's low frequency range the impedance dips to around 4 ohms. This does not pose a problem for most solid state or tube amplifiers that are rated to drive a four-ohm load. Tube type power amplifiers can usually use the 8-ohm tap.

The speaker's sensitivity is low by traditional speaker measurements. Depending on the measurement method, it will measure as low as 80dB. The directional characteristics of the speaker make the apparent efficiency slightly higher, but it will still be less efficient than a conventional loudspeaker. A 100-watt audio amplifier can drive a speaker about 20dB above its sensitivity rating. For the LFT-12, this means 100-104dB at 1 meter. When the amplifier output is 100 watts per channel, the speaker's maximum sound output limit can quite possibly be exceeded. The diaphragm "slapping" against the magnets indicates this over-excursion.

GETTING THE BEST PERFORMANCE FROM THE LFT-12

The LFT-12 is designed to have flat on-axis frequency response. This may present a problem with some program material at lower volume levels, depending on your listening tastes. At low sound levels, the human ear is mostly sensitive to midrange frequencies and high frequencies, to a lesser degree. Because of this, the speaker may sound thin at low volume levels.

The LFT-12 is purposely designed to be highly directional. This characteristic improves three-dimensional acoustic images by focusing the sound into a tight radiation pattern. The speaker should point directly toward the listener. If the frequency balance is too bright, when the speakers are aimed directly toward the listening position, use the adjustment spikes to raise or lower the speaker's axis of projection. If positioned correctly, the LFT-12 can project apparent sound sources well beyond the boundaries of the speaker, if the program material contains the correct information.

All drivers in an audio system should ideally operate in phase. Careful consideration should be paid to the correct polarity of all loudspeakers. The LFT-12's positive terminal with a positive signal applied will displace the diaphragm toward the front of the speaker. The LFT-12 is a dipole; meaning sound radiated from the back of the speaker is the same as what comes from the front of the speaker

The LFT-12's panels have accurate phase and impulse response. This means there is no time delay between low and high frequencies electronically entering and acoustically leaving the speaker. In the LFT-12, if a low and high frequency signal appear at the input to the speaker at the same time- they will (as sound) leave the speaker at the same time. In a cone speaker, this is usually the case only over a very narrow range of frequencies. This presents problems when interfacing speakers with unique crossover design and type. Some crossovers are phase inverting through the crossover frequency; some are not.

CLEANING

The wood cabinet surface of the speaker can be cleaned with ordinary household wood cleaners. **Do Not** spray any liquids on the speaker that would get on the diaphragm. Dust can be removed from the speaker with a feather duster, damp cloth or by brushing the surface of the speaker with a clean paintbrush. Dust can be removed from the grille with a brush or feather duster.

TECHNICAL DESCRIPTION

The Eminent Technology Linear Field Transducer (LFT) is a full-range, push-pull, dynamic planar loudspeaker. In a sense, it is the magnetic equivalent of a push-pull electrostatic loudspeaker, differing in that it requires no step-up transformer or bias voltage, and that the audio signal is applied directly to its diaphragm.



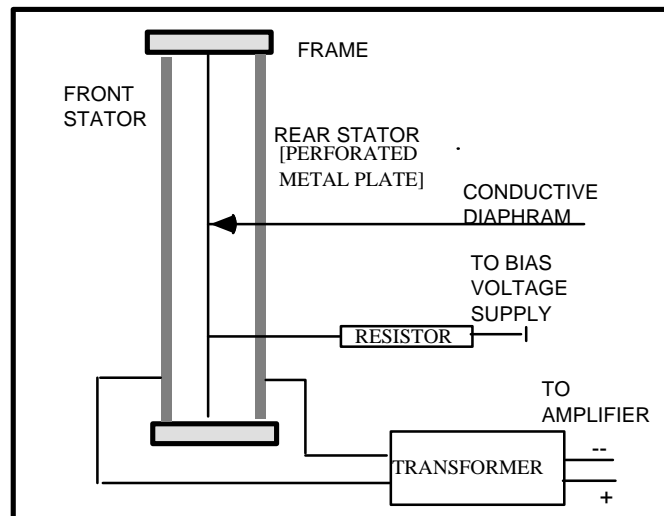
THE LFT-12

A REVIEW OF PREVIOUS LOUDSPEAKER TECHNOLOGY

To fully understand the strengths of the LFT design, one must first consider the design and operation of this speaker's three most notable antecedents: the push-pull electrostatic loudspeaker (ESL); the traditional, single-ended planar magnetic loudspeaker, and the ribbon loudspeaker.

THE ELECTROSTATIC LOUDSPEAKER

The electrostatic loudspeaker is constructed with a very thin (half mil or less) diaphragm made of Mylar or a similar material, to which a light coating of mildly conductive substance such as graphite has been applied. This diaphragm is suspended on a rigid frame and sandwiched between two stationary conductive grids (usually perforated metal plates) called stators.



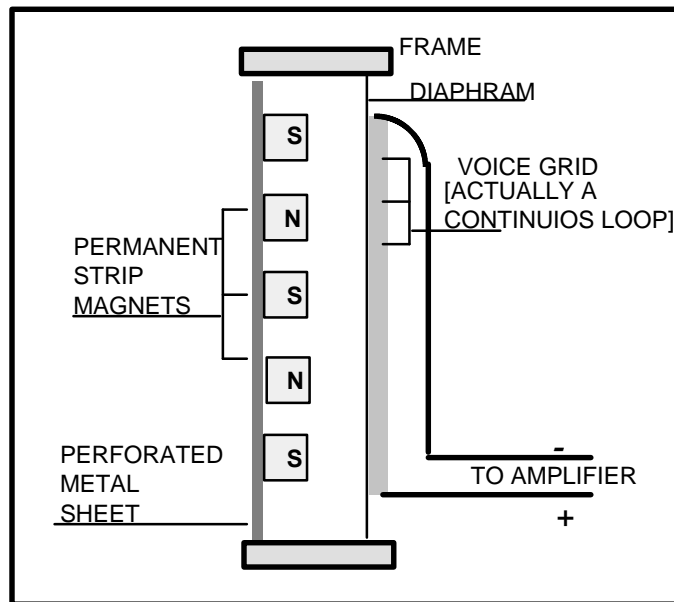
ELECTROSTATIC LOUDSPEAKER
[TOP VIEW CROSS SECTION]

A DC charge of high voltage (in the thousands of volts) but very low current, known as the bias voltage, is applied to the conductive diaphragm and kept constant. A step-up transformer is introduced to increase the usable voltage of the amplifier's output (while simultaneously decreasing the current), and the two ends of the transformer's output coil are connected to the two stators.

As the amplifier produces a continuously varying AC voltage, (the amplified music signal), the charge on the two stators will also continuously change in synchronization with the music; and since the two stators are connected to two different ends of the transformer's output, one stator will take on a predominantly negative charge at the same time and to the same extent that the other stator takes on a predominantly positive charge. The constant-charge diaphragm will thus undergo a continuously changing state of attraction to and repulsion from the two stators as their polarization changes, and it is this motion that excites the air to the front and rear of the speaker and produces sound.

THE TRADITIONAL PLANAR MAGNETIC LOUDSPEAKER

The traditional planar magnetic also starts with a thin Mylar diaphragm, one side of which is coated with adhesive and fitted with an aluminum wire voice grid, (analogous to the voice coil of a conventional cone driver). The diaphragm is held taut in a metal frame. On the front of this frame is a large sheet of perforated metal, to which rows of vertically aligned strip magnets have been fastened.

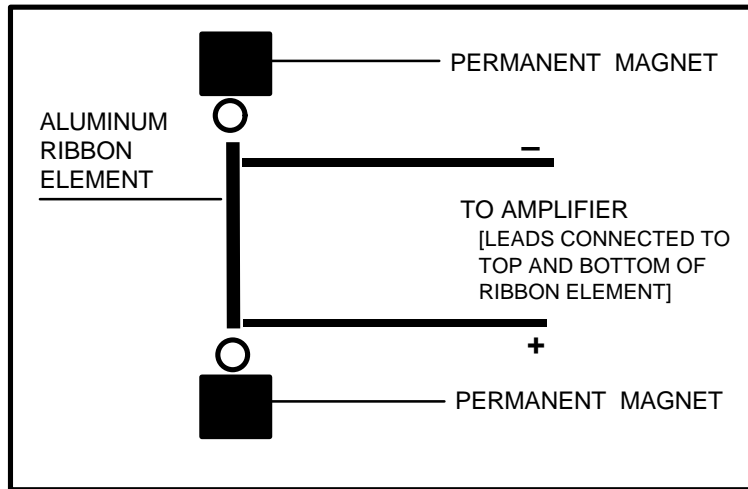


SINGLE-ENDED PLANAR MAGNETIC
 [TOP VIEW CROSS-SECTION]
 Spacing exaggerated to show detail

From there, the operation of a single-ended planar magnetic loudspeaker is remarkably similar to that of a conventional cone driver: The amplifier's output is sent directly through the voice grid and, because it is suspended within a stationary magnetic field, the grid moves back and forth within that field in synchronization with the AC voltage that is the amplified music signal. Since the voice grid is permanently fastened to a taut diaphragm, the diaphragm also moves in synchronization with the music signal, exciting the air and producing sound.

THE RIBBON LOUDSPEAKER

The third and final antecedent to consider is the ribbon loudspeaker: a distinctly different sort of transducer, but one that is similar (in principle, at least) to the single-ended planar magnetic loudspeaker. The ribbon's primary distinction is that its "diaphragm" and "voice element" are one and the same. A ribbon driver is based on a long, narrow strip of conductive material; in practice, thus far, all true ribbons have used a strip of very thin corrugated aluminum for this purpose. The two ends of this strip are electrically connected to the amplifier's output, and are physically anchored such that the strip is suspended within a stationary magnetic field--with magnets positioned at the edges of the strip.



RIBBON DRIVER
[TOP VIEW CROSS-SECTION]

The operating principle is straightforward from there: the amplifier's output passes directly through the aluminum strip--which, because it is suspended within a permanent magnetic field, moves back and forth in synchronization with the signal, producing sound.

EVALUATING EARLIER APPROACHES

Not surprisingly, each of the approaches described above has its own unique set of pros and cons. The electrostatic, because its diaphragm is so thin and light, offers exceptionally good transient response and reproduction of subtle, low-level musical detail. And, because it is a true push-pull device (i.e., its diaphragm is, by design, driven from both the front and the rear), the ESL operates in a linear fashion. Typically, gross distortion results only when the driving amplifier clips into the speaker, or when, in an attempt to play the speaker louder than its design allows, its step-up transformer reaches a point of saturation.

On the negative side of the ledger, the ESL does require passing the amplified musical signal through a transformer, which can introduce its own colorations and non-linearities. Also, some ESLs are prone to a condition known as arcing: Under the conditions of stress induced by playing an ESL loudly, it is not uncommon for an electrical spark to jump between one stator and the diaphragm (a phenomenon exactly analogous to lightning), burning a minute hole in the diaphragm and, over time, causing failure.

As for the planar magnetic, its strengths are similar to those of the ESL--although the addition of several feet of wire and an adhesive coat make for a somewhat more massive diaphragm, limiting this design's transient capabilities by comparison. However, the planar magnetic requires no step-up transformer or bias voltage supply, and it has the added benefit of being an extremely manageable load for most amplifiers. However, the most specific drawback of the traditional planar magnetic is that it is a single-ended (as opposed to push-pull) device: As the diaphragm's physical excursion increases, the voice grid moves further away from its optimal location within the permanent magnetic field (at least in one direction). Thus, at the very instant when this speaker is called upon to reproduce large-amplitude waveforms, it is least able to do so without distortion.

In many ways, a ribbon driver can be an excellent performer: the moving element (the "ribbon" itself) is extremely light, allowing good "speed" and transient performance as well as freedom from coloration. There is no significant physical structure on either side of the ribbon's radiating pattern. The ribbon's main problem is not one of performance but of application: it cannot be used to reproduce low frequencies. To create a moving element large enough to generate frequencies lower than a few hundred Hz would mean moving opposing magnetic poles so far apart that they would no longer exert a sufficient magnetic field over the entire area of the ribbon.

Also, when a ribbon is operated at frequencies approaching the element's own resonant frequency (which is naturally quite low, due to its high compliance), the ribbon element stretches and "bows" to a point where it is no longer within the magnetic gap. To get around either of these problems means to move the permanent magnet structure from the edges of the element to one entire side of the element, and/or to bond the element to a "host" diaphragm, such as a sheet of Mylar, and to clamp that diaphragm around its perimeter. In either case the driver is no longer a ribbon; it is, in fact, a planar magnetic. To date, no one has succeeded in creating a full range ribbon loudspeaker.

LINEAR FIELD TRANSDUCER CONSTRUCTION

Eminent Technology's Linear Field Transducer, introduced as the LFT, represents a new approach to the design and construction of a high-quality loudspeaker*. It builds on the strengths of the above designs while eliminating many of their drawbacks.

DIAPHRAGM CONSTRUCTION

The construction of the LFT-12 diaphragm begins by laminating a very thin sheet of aluminum foil to a half-mil-thick sheet of Mylar. A voice grid pattern, created by means of CAD (Computer-Aided Design) technology, is silk-screened onto the foil side; the remainder of the aluminum--the part not covered by ink from silk-screening is chemically etched away, in a manner similar to the etching of traces on a printed-circuit board. The ink is then washed away, leaving a voice grid of near perfect uniformity. This technique results in a diaphragm/voice coil grid that is still less than two mils in total thickness, and also permits relatively narrow spaces between the individual traces, so the diaphragm can be evenly driven over its entire surface.

With this construction, the entire diaphragm area of the LFT-12 is driven full range. For midrange and high frequencies, the wavelength of sound is smaller than the diaphragm, making the speaker very directional. This characteristic substantially improves performance for separation and three-dimensional effects over speakers that use conventional cone drivers.

THE MAGNET / FRAME STRUCTURE

The magnet/frame structure developed for the LFT-12 is also unique. Eminent Technology builds its magnets onto a steel plate and a series of channels. The magnets and steel channels have a size and shape that have been carefully designed to help shorten the magnetic flux path and concentrate the strength of the magnetic field on the appropriate area of the diaphragm/voice grid. Two U.S. patents (4,837,838 and 5,901,235) have been granted to Eminent Technology on its innovative magnetic circuits for flat panel loudspeakers.

Interestingly, one of the biggest challenges faced in creating a true push-pull dynamic speaker was not a design consideration but rather a matter of construction difficulty: to assemble a rigid structure with very powerful permanent magnets at the front and the rear, both sides opposing each other with tremendous force. *****Warning*** This speaker should never be taken apart as it will destroy itself upon removal of the hardware holding it together. Please consult the factory for any service needs.**

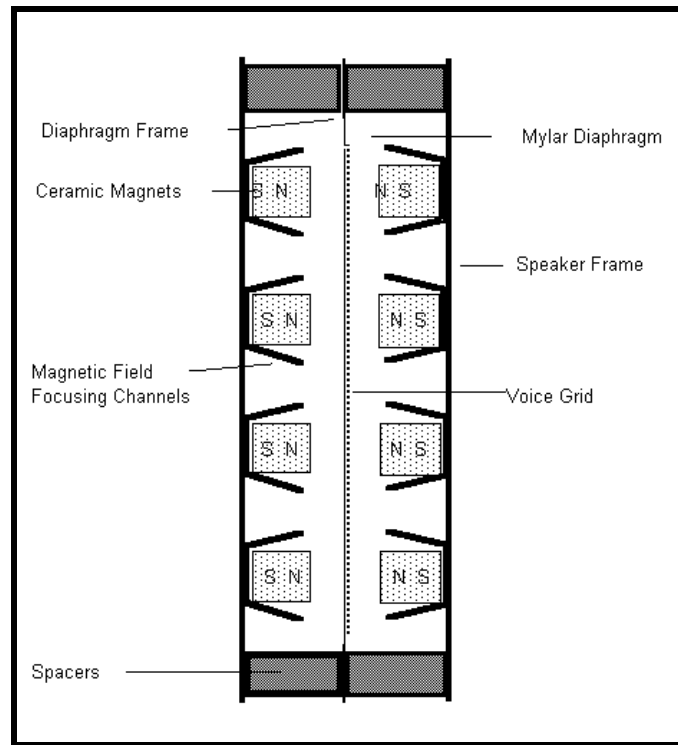
By applying such new techniques to planar loudspeaker construction, Eminent Technology has been able to eliminate many of the flaws inherent in earlier designs and significantly reduce the size.

Cloth is used on the back of the speaker to resistively load the diaphragm. This lowers the Q of the diaphragm's free air resonance. The planar-magnetic panels, which are derived from the LFT-10 speaker, have a redesigned magnet structure, taking advantage of new Neodymium magnets to increase efficiency.

The use of a welded channel and steel plate frame dispenses with the need for perforated sheet metal (an "off-the-shelf" material presumably used for reasons of economy and ease of manufacture.) thus greatly improving dispersion, especially at high frequencies.

Since it is now possible to have a powerful, precisely aligned magnet structure on both sides of the diaphragm, true push-pull operation has been achieved: Regardless of the degree of excursion

the diaphragm undergoes, the voice element is always optimally positioned within the magnetic field. The result is extremely linear performance throughout the audible range, with a profound increase in dynamic range and an absolute minimum of distortion.



LFT-12 LINEAR FIELD TRANSDUCER
[TOP VIEW CROSS SECTION]

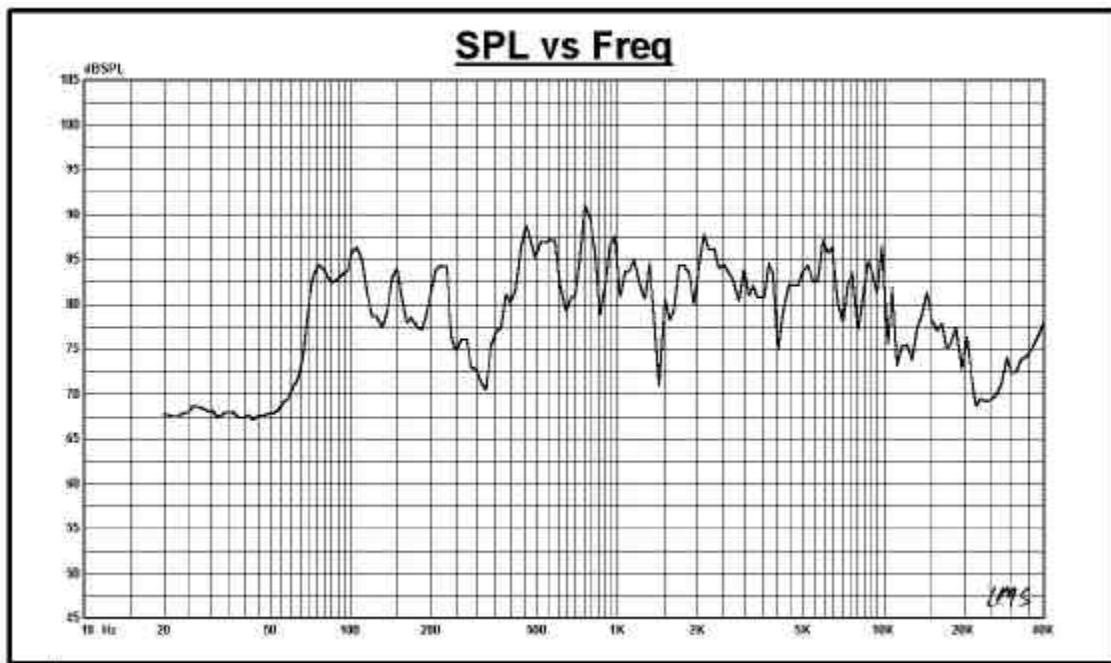
TECHNICAL INFORMATION
GENERAL SPECIFICATIONS

Frequency Response	70Hz - 20Khz + or - 4dB
Sensitivity	85dB@ 1 watt/1 meter
Minimum suggested power	35 watts RMS per channel into 8 ohms
Maximum suggested power	150 watts per channel into 8 ohms
Maximum sound pressure level	103 dB at 1 meter (midband)
Total Radiating Area	140 sq. in.
Impedance	8 ohms nominal (4.2 ohms minimum)
Dimensions	26"W by 5.5" D by 10.5" H
Weight	19.5 lbs.
Available Finishes	Oak, Walnut, Black Painted Oak
Manufacturer s Suggested Retail Price	\$950.00

LFT-12 PANEL SPECIFICATIONS

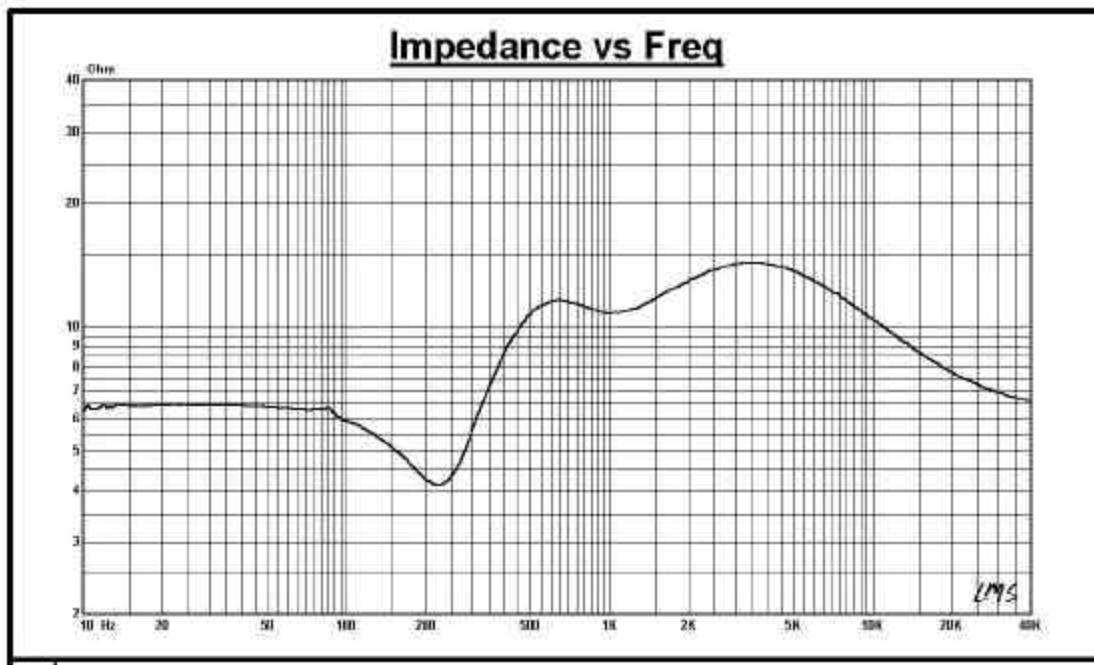
Magnet Type	Ceramic 8, Neodymium 40
Foil Thickness	.0007 in.
Mylar Thickness	.0005 in.
Laminate Adhesive Thickness	.00015
Gap Between Conductors	.030 in.
Peak-to-Peak Diaphragm Excursion	.120 in.
Diaphragm Weight	1 gram
Free Air Resonance	120 Hz

FREQUENCY RESPONSE

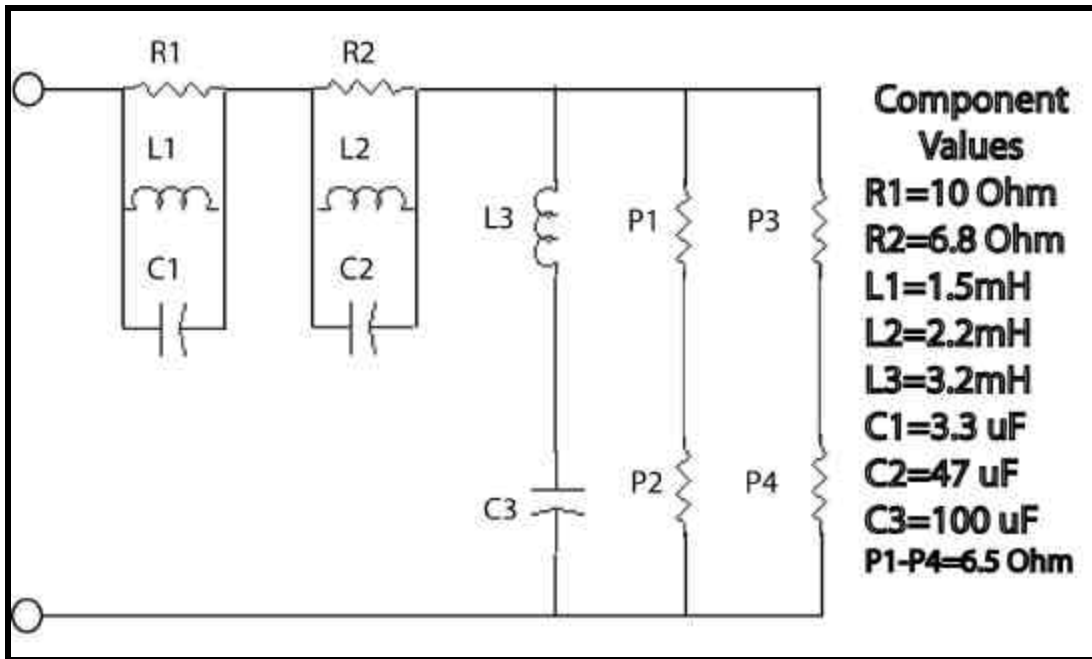


MEASUREMENTS TAKEN WITH AN INPUT OF 1W/1METER

IMPEDANCE CURVE



CROSSOVER INFORMATION



LFT-12 ELECTRICAL SCHEMATIC

WARRANTY

Thank you for purchasing the LFT-12. Eminent Technology Inc. warrants the LFT-12 Loudspeaker to be free from defects in materials and workmanship for a period of 30 days from the date of purchase. Within that period, any failure of the LFT-12 will be corrected without charge for parts, labor, or transportation from the factory. After this period, pending receipt of the warranty form (filled out and mailed to Eminent Technology, and postmarked no later than one month after the date of purchase), the above warranty will be extended to five years for parts and three years for labor. This warranty is transferable to subsequent owners, pending notification from the original owner, in writing, within 10 days of the personal sale.

The obligation of Eminent Technology under the terms of this warranty does not extend to:

1. Any LFT-12 installed or operated without regard for the instructions contained in this manual.
2. Any LFT-12 while under performance testing or after being used in such a test, by any personnel or facility not authorized by Eminent Technology.
3. Any other component or part connected to or operated in conjunction with the LFT-12.
4. Any traumatic, accidental damage, or damage incurred in shipping, or defects which upon examination by Eminent Technology and in its sole opinion have been caused by abuse, neglect, improper or abnormal installation, or operation for extended periods in industrial applications.

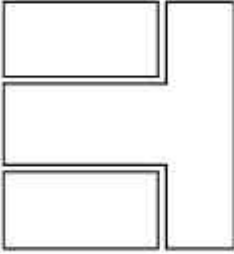
This warranty is not applicable if any part of the LFT-12 has been removed or taken apart, repaired, altered, or modified by anyone, nor if the serial numbers have been defaced or rendered illegible.

If an Eminent Technology product is removed from the country in which the original consumer purchase was made, Eminent Technology dealers and distributors in other countries are not obligated by the terms of this warranty. Eminent Technology reserves the right to incorporate design refinements and changes to its products without notice or obligation. If practical, such design modifications will be made available to owners of existing units for a reasonable charge.

Under the terms of this warranty, Eminent Technology expressly does not insure for loss of use of the LFT-12 due to failure or periods of repair. Warranty repairs can only be carried out by the factory. The LFT-12 must be returned prepaid in its original factory carton to:

Eminent Technology, Inc
225 East Palmer Street
Tallahassee, FL 32301

Phone: (850) 575-5655
FAX: (850) 224-5999
service@eminent-tech.com



**EMINENT TECHNOLOGY, INC. LFT-12
WARRANTY FORM**

Name _____

Address _____

City _____

State _____ Zip _____

Dealer Purchased From _____

Dealer Address _____

City _____

State _____ Zip _____

Date Purchased _____ Serial Number _____

Please complete this form and return to:

**EMINENT TECHNOLOGY
225 East Palmer Street
Tallahassee, FL 32301
U.S.A.**