YOU CAN AFFORD TO LISTEN TO DALI

It seems only natural that an elegant, state-of-the-art loudspeaker series would originate in a country where design, manufacturing, and scientific measurement have evolved into high art. DALI — for Danish American Ltd., Inc. — is proud to offer an exciting new series of loudspeaker systems which embody the finest traditions of Danish engineering excellence and hand craftsmanship.

Each DALI speaker is the result of an intensive engineering effort committed to producing uncompromised speaker performance in a reasonable price range. It is our basic philosophy that once you devote sufficient resources to research and development you can obtain excellent sound quality in virtually any price range. Since we have found ways to eliminate high costs in the area of marketing loudspeakers, we have been able to put almost all of the expense in the loudspeaker design itself. Crossover networks and cabinet configurations, for instance, are design areas with lots of room or optimization, and we don't go easy on development costs. DALI's test lab includes the most precise and informative measuring equipment money can buy; a $100,000 Bruel & Kjaer 9550 Time Delay Spectrometry system can tell us a great deal about how close we might be to an ideal speaker design

DALI

HOW MOST OTHER AUDIO SPEAKERS ARE DESIGNED

Within any well-designed line of speaker products, the overall sound character should be consistent model-to-model; the quality should only change as the price increases.

Most manufacturers, however, design speaker systems by convenience. That is, they come across a particular design that sounds good and then they attempt to build a line of products around that one design. These products are conveniently arranged for **price** levels,not for quality levels. This is why in any given line of speaker products only one or two speakers may sound good to you for the money.

If all speaker systems were properly designed for each of their respective sizes, you would hear only three discernible differences as the prices increase:

1) Lower, more realistic bass response (but not "boomier").
2) Increased dynamic range and power handling capability.
3) Increased (to some degree) clarity of reproduction.

Instead, what you will hear if you listen carefully, are dramatic changes in sound **character** between the different models.

Why this trend is evident within speaker product lines? The only logical explanation is that manufacturers don't spend enough time listening to their product to properly qualify their designs, and they don't have adequate test equipment to correct design flaws. Most importantly, they will not — or cannot — use the highest quality components within their systems to allow optimum performance for each quality level of product.

THE DALI DESIGN PHILOSOPHY

Based on our overwhelming success, we knew we were on to something good. DALI's basic philosophy — sound excellence at affordable prices — was so effective that the Danish government decided to support additional research and development to improve our products and expand DALI's already considerable market. We are happy to report that we have been successful on both counts, and have grown beyond our most optimistic expectations.

We're quite proud of our success, and the effort that goes into each DALI audio product is a direct result of our commitment to creating exceptional speaker designs that anyone can afford. By understanding the processes involved in developing DALI products, you'll be able to appreciate why DALI is capable of designing superior speaker systems, and why our growth has been so dramatic over the past few years.

Each DALI speaker is the result of a design approach which unites the finest audio components in a system optimized for absolutely accurate performance — the ability to reproduce any high quality audio source with natural uncolored sound.

To this end, each DALI speaker system is conceived through this simple, yet rigorous, design procedure:

1) Determine the physical size of the speaker cabinet.
2) Calculate the optimum relationships between the internal cabinet dimensions to diffuse standing waves and minimize their amplitude.
3) Select the optimum size woofer for the given cabinet size.
4) Calculate all woofer performance parameters, such as moving mass, magnet mass, suspension compliance, mechanical Q, electrical Q, etc.
5) Design a complimentary tweeter and midrange for optimum integration with the selected woofer.
6) Determine precise driver locations for optimum dispersion and minimal diffraction effect.
7) Measure all drivers for distortion, frequency response, and other performance specifications.
8) Calculate theoretical crossover systems for flat frequency response, proper phase response, and other critical performance specifications.
9) Make extensive detailed measurements of complete system performance.
10) Refine crossover for most accurate frequency response.
11) Conduct initial listening tests.
12) Based on the results of first listening tests, we decide how far back we must go in the development process. At that point we go through all measurements in the laboratory again.
13) Conduct second listening tests. These are usually simpler than the initial tests because most of the problems have been eliminated.
14) Sequence 12 and 13 are repeated over and over again until the panel of listeners is completely satisfied with the new DALI system.

Much of this measurement and evaluation is performed with the highest degree of accuracy thanks to DALI's sophisticated, state-of-the-art measuring equipment. Our Bruel and Kjaer Type 9550 Time Delay Spectrometry system is united with an Apple Macintosh and also combined with an FFT Fast Fourier Transformer. This very elaborate measuring system allows intricate measurements of frequency response, acoustic and electrical phase response, time magnitude, impedance, differential tone distortion, and harmonic and intermodulation distortion. We can also plot three-dimensional time frequency/level diagrams and do far field and vibrational analysis.

That sort of information can tell us alot about how a speaker system measures, but it doesn't really tell us anything about how it stands to the most demanding measuring device — the human ear. In the final analysis, all measurement specifications must be reconciled with extensive listening evaluation.

LISTENING TEST PROCEDURES

To avoid making speakers that suit only a few listening environments, we utilize three entirely different listening rooms to evaluate DALI products:

ROOM A

Room A is a specially designed listening room with

(Continued on back panel.)

DALI SPEAKERS

DALI's design philosophy also dictates that the sound quality be retained consistently throughout the entire model line; our more expensive, larger models don't "thunder" or "boom" bass — they just handle more power and provide better bass response than our more compact models.

DALI 2

Although the DALI 2 is our smallest speaker, it faithfully exhibits this part of our philosophy. It 6 1/2" two-way configuration provides extremely accurate reproduction over the entire operating bandwidth. On-axis as well as off-axis response of this little speaker are within the studio monitor limits of +-3dB for the 68-20,000 Hz (30 degrees 18kHz) range. The phase measurements, impedance and time-magnitude curves are exceptionally fine.

The high performance woofer utilizes a composite laminate pulp, polyvinyl cone which is very well damped for tight, accurate bass response. The tweeter is an advanced 1" voice coil soft polypropylene dome. Its response is exceptionally smooth and extended to 20kHz — a benefit of the ferrofluid injected voice coil gap.

The 3rd order acoustic Butterworth crossover network with polycarbonate coupling capacitor provides good phase and amplitude response. The cabinet finish and construction is to the highest Danish quality. 5/8" thick, high density pressed wood box is covered with real walnut veneer, sanded and finished twice to give it a durable and beautiful surface. Unique grille design with angled cut-out minimizing high frequency edge reflections, results in the same measurement curves and sound quality with and without the grille on the front baffle!

The speaker is designed to perform well on a book shelf or flat against the wall. Optimum display height is 20" to 40" off the floor. In all, the DALI 2 is an ideal choice where exceptional performance is desired, but space or budget considerations dictate a smaller sized system.

Time/magnitude. This curve shows the dissipation over time of total energy. The first 2 milliseconds are particularly interesting. A small cabinet will result in at better curve than a large cabinet, and sharp edges and speaker units that are not flush with the mounting board will worsen the course of the curve.

The upper curve shows the frequency response as measured on the axis of the loudspeaker at a distance of 60". The lower curve shows the frequency response as measured at an angle of 30°, but at the same distance (60"). For the sake of clarity, the off-axis curve has been moved down a bit on the graph paper.

The impedance curve for the system. It is obvious that the speaker constitutes an easy load to any amplifier.

DALI 3

The DALI 3 is a two-way 8" design which employs a high performance woofer and 1" voice coil, ferrofluid injected dome tweeter. this system delivers exceptionally fine performance with clear, articulate reproduction of even the most complex musical waveforms.

Particular care has been taken in determining proper crossover relationship, especially in the minimization of any hysterisis effect. Overall sound quality is extremely well-balanced and linear over the operating range of 50Hz-20kHz. The smooth frequency response combined with very uniform impedance make the DALI 3 an easy load for any decent amplifier.

The front and rear baffles of the real wood, walnut veneered cabinet are made of 7/8" thick high density pressed wood. The non-reflection grille design provides unchanged sound quality with and without a grille on. The DALI 3 can be optimally positioned on a shelf, speaker stand, or against the wall, and is fully capable of reproducing the most demanding musical sources, including Compact Discs. Optimum display height is 20" to 40" off the floor.

In fact, many audio critics and journalists have praised the DALI 3 as one of the finest sounding speakers available in this size configuration.

Time/magnitude. This curve shows the dissipation over time of total energy. The first 2 milliseconds are particularly interesting. A small cabinet will result in at better curve than a large cabinet, and sharp edges and speaker units that are not flush with the mounting board will worsen the course of the curve.

The upper curve shows the frequency response measured on the axis of the loudspeaker at a distance of 60". The lower curve shows the frequency response as measured at an angle of 30°, but at the same distance (60"). For the sake of clarity, the off-axis curve has been moved down a bit on the graph paper.

The impedance curve for the system. It is obvious that the speaker constitutes an easy load to any amplifier.

DALI 4

By incorporating a dual 8" woofer configuration, the DALI 4 provides significantly better bass response and power handling than more compact models. The DALI 4 also offers 3dB better efficiency than systems using a single woofer, making it especially effective with lower and medium powered electronics units. The symmetrical woofer alignment also allows improved stereo imaging and increased dimensionality.

The 1" polypropylene dome-diaphragm tweeter with the ferrofluid injected to the magnetic gap and the powerful magnetic circuit extends the high frequency response of this system to 20kHz +-3dB.

The sophisticated, phase-optimized crossover incorporates the tweeter discharge capacitor and provides seamless transitions between complimentary drivers.

The real wood, walnut veneer finished cabinet of DALI 4 is built with the 7/8" thick front and rear pressed wood baffles and 5/8" thick side panels.

DALI 4 is designed for placement approximately 8" off the floor for the optimum stereo imaging and bass coupling. We offer optional heavy gauge, black, steel speaker stands designed especially for this moder.

Our comparisons firmly place the DALI 4 at the top of its class in terms of sound quality; its elegant appearance and affordable price make it clearly one of the best values available to the serious audio enthusiast.

Time/magnitude. This curve shows the dissipation over time of total energy. The first 2 milliseconds are particularly interesting. A small cabinet will result in at better curve than a large cabinet, and sharp edges and speaker units that are not flush with the mounting board will worsen the course of the curve.

The upper curve shows the frequency response as measured on the axis of the loudspeaker at a distance of 60". The lower curve shows the frequency response as measured at an angle of 30°, but at the same distance (60"). For the sake of clarity, the off-axis curve has been moved down a bit on the graph paper.

The impedance curve for the system. It is obvious that the speaker constitutes an easy load to any amplifier.

DALI 6

Without question, the DALI 6 is one of a handful of true "world class" loudspeaker systems currently available, regardless of price concerns. The DALI 6 utilizes a closely integrated three driver system including a 10" woofer, a 8" upperbass/midrange, and 1" voice coil dome tweeter. The 8" unit extends its response up to the tweeter's crossover point, while the 10" woofer rolls off at 1500 Hz. Both units work together — at the same volume — in the low frequency range.

The tweeter is 1" impregnated textile dome with a hexagonal wire voice coil wound on an aluminum former, featuring; copper beryllium leads, dampened rear chamber and ferrofluid injected in the gap for cooling and proper centering of the voice coil. This high sonic quality dome tweeter has a peak power handling capability of 1000 watts for 10 milliseconds above 2500 Hz.

The advanced crossover design includes suction and electrical phase angle control circuits, allowing smooth, complimentary operation of all driver components: the performance of the DALI 6 is truly much more than the sum of its respective parts.

Each pair of DALI 6 speakers is mirror-imaged for optimum stereo imaging and closely matched for the most balanced stereo reproduction possible.

As with other DALI systems, cabinet veneer and construction are of the first order, fully enhancing the superb performance characteristics. The DALI 6 is truly an engineering marvel — a loudspeaker designed for the finest home listening systems and environments.

Time/magnitude. This curve shows the dissipation over time of total energy. The first 2 milliseconds are particularly interesting. A small cabinet will result in at better curve than a large cabinet, and sharp edges and speaker units that are not flush with the mounting board will worsen the course of the curve.

The upper curve shows the frequency response measured on the axis of the loudspeaker at a distance of 60". The lower curve shows the frequency response as measured at an angle of 30°, but at the same distance (60"). For the sake of clarity, the off-axis curve has been moved down a bit on the graph paper.

The impedance curve for the system. It is obvious that the speaker constitutes an easy load to any amplifier.

DALI 8

The DALI 8 stands alone among contemporary speaker designs in that it delivers so much performance at such a reasonable price. The DALI 8 embodies the latest DALI engineering innovations, incorporating dual 8" long fiber pulp woofers, a 4 1/2" midrange, a 1 3/8" dome tweeter, and a 3/4" ultra high frequency driver.

The long — 3/4 of an inch — linear excursion woofers are capable of generating 118 dB at 35 Hz!

The low distortion midrange unit reproduces the frequencies between 1000 to 3000 Hz, where the large 1 3/8" dome tweeter takes over. This unique tweeter has extremely transparent and spacious sound without any harshness even at the highest sound levels! The ultralinear 3/4" supertweeter extends the frequency response of the system from 8kHz to 23kHz.

The crossover is a 20 component configuration which includes a second order Quasifilter, with crossover frequencies occurring at 1000, 3000, and 8000 Hz.

The overall frequency response is impeccably accurate and linear over the operating bandwidth of 33Hz-23kHz. In terms of sound quality, the DALI 8 offers uncolored, extremely detailed reproduction of high quality musical sources. With good equipment it is impossible to tell the recording from an actual live performance. In this sense, the DALI 8 is a speaker which allows you to hear music as a full, open, dynamic experience, without any qualities of boxiness, or compression.

To hear the DALI 8 is to hear the integrity and musicality of superior loudspeaker design.

Time/magnitude. This curve shows the dissipation over time of total energy. The first 2 milliseconds are particularly interesting. A small cabinet will result in at better curve than a large cabinet, and sharp edges and speaker units that are not flush with the mounting board will worsen the course of the curve.

The upper curve shows the frequency response at ear level with the speaker placed on the floor. Measuring distance 60". The lower curve shows the frequency response as measured at an angle of 30°, but at the same distance (60"). For the sake of clarity, the off-axis curve has been moved down a bit on the graph paper.

The impedance curve for the system. It is obvious that the speaker constitutes an easy load to any amplifier.

very thick concrete walls which are treated with different surface materials to absorb a wide range of frequencies. The room is absolutely free of spurious resonances, rattles, etc., so that any resonance in the speakers will be detected. The room measures 40 feet in the longest direction so that even the lowest frequencies can be reproduced.

ROOM B

Room B is a large living room with a fairly long reverberation time.

ROOM C

Room C is a small living room with high absorption materials.

Our carefully chosen listening panel consists of six people with musical tastes ranging from classical to rock. All of these people have been selected for their ability to hear very subtle differences in tonal characteristics, sonic definition, and imaging. All listening panel members are asked to listen to the speaker systems and describe the sound in specific terms without comparison to other speakers. Then each listener has to make an A/B blindfold test against our reference speaker system for each specific quality class. The difference in sound between our speaker and the other reference speaker is then described. During this process the listener does not know which speaker is ours and therefore cannot be biased. All evaluations are based on a wide variety of music. After all listening sessions are completed the results are compared and the most severe problems are then discussed. Following this session we focus on specific problem areas and go back to the laboratory results to find correlations within our measurements.

Production of any DALI speaker design does not begin until its sound quality is unanimously passed by our panel of listening experts.

If all of this tells you something about DALI's dedication to acoustic excellence, it's the speakers themselves which ultimately tell the complete story. To hear a DALI speaker, to see the elegant handrubbed Danish cabinetry is to see the true expression of hard work and attention to detail. It's the kind of quality which is appreciated by growing numbers of satisfied DALI owners worldwide.

The success of DALI is based on hard work, solid acoustic principles, and our innovative marketing policies, and has been proven over and over again. With a dedication to creating products which reproduce music — and music only — DALI continues to evolve and grow, and is already one of the world's most respected loudspeaker manufacturers. If you have doubts about our claims, all we ask you to do is listen, listen to a pair of DALI speakers. They can tell the story much more eloquently than we ever could.

SPECIFICATIONS

ALL ENCLOSURES ARE GENUINE WALNUT VENEER.

DESCRIPTION	DALI 2	DALI 3	DALI 4	DALI 6	DALI 8
Recommended Amplifier Power					
Min.	10 Watts	5 Watts	5 Watts	10 Watts	10 Watts
Max.	60 Watts	80 Watts	140 Watts	200 Watts	350 Watts
Frequency Response					
--3dB	60-20,000Hz	55-20,000Hz	55-20,000Hz	40-20,000Hz	33-23,000Hz
DIN	45-20,000Hz	40-20,000Hz	40-20,000Hz	35-22,000Hz	28-25,000Hz
Sensitivity					
1 Watt/1 Meter	89dB	90dB	93dB	91dB	92dB
Crossover Frequency	3,000Hz	2,500Hz	2,500Hz	2,500Hz	1,000/3,000/8,000Hz
Drivers					
Low Frequency	6½"	8"	2X8"	10"	2X8"
Low Midrange	—	—	—	8"	—
Midrange	—	—	—	—	4¼"
High Frequency	1" Dome	1" Dome	1" Dome	1⅛" Dome	1⅜" Dome
Super Tweeter	—	—	—	—	¾"
Nominal Impedance	8 Ohms	8 Ohms	4 Ohms	6 Ohms	8 Ohms
Cabinet Type	Acoustic Suspension	Acoustic Suspension	Acoustic Suspension	Acoustic Suspension	Bass Reflex
Internal Volume	13 Liters	20 Liters	42 Liters	58 Liters	82 Liters
Thickness of Wood Enclosure					
Sides	⅝"	⅝"	⅝"	⅞"	⅞"
Baffles	⅝"	⅞"	⅞"	⅞"	⅞"
Speaker Stands	—	—	Optional	—	—
Dimensions *HXWXD*	14X9X9"	17X11X9"	30X12X9"	37X11X12"	38X12X16"

DALI

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PRINTED IN DENMARK BY JYDSK CENTRALTRYKKERI A/S