Audio Note

Music's Finest Conductor

The Audio Note™ Absolute Zero AZ-One Loudspeaker.

INTRODUCTION.

First of all thank you for buying an Audio Note™ product, I hope that it will reward you with many years of good quality music and reliable service.

As a company our main aim is to design and manufacture equipment which gives you the maximum sonic performance for the price and to do this we use many unconventional solutions and the AZ-One speaker is no exception to this, so it is important that you read this brief manual carefully, in order for you to get the best performance and sound from your new speakers.

The AZ-One is designed to be used without a front cover or grill, and is therefore not supplied with one. A cover can be easily made from transparent foam and four dots of Velcro!

As with all Audio Note™ speakers, no corners have been cut in terms of component and driver quality despite the modest price of the AZ-One, the woofer is the new 5 inch Vifa paper cone unit combined with an upgraded version of the AN-K's 3/4" tweeter featured in the two-way line-up together with a heavy duty crossover with air core inductors, silver plated speaker terminals and Audio Note AN-D internal wiring.

All the Absolute Zero models share the following design features,

1.) Rear loaded folded quasi parabolic horn with rear facing mouth.

2.) Floorstanding with built-in spikes.

3.) High efficiency, and more importantly best possible dynamic power transfer behaviour to maximise acoustic output to power input.

In our quest to deliver a compact high sensitivity speaker with good room interface we have reinvestigated and re-evaluated all the main principles of horn loaded cabinet designs, and this knowledge coupled with our expertise in system dispersion and associated crossover design, has resulted in a speaker system that

redefines not only the quality-price relationship at any level which is important when making basic comparisons to the competition, but more importantly the AZ Series speakers offer an emotional quotient of reproduced acoustic performances that is quite in a class of its own.

The vast majority of directly radiating diaphragm designs have very poorly matched acoustic impedance resulting in the characteristically low efficiency, in contrast a horn loaded system where a suitable geometric design of the horn mouth and internal expansion rate allows the acoustic impedance to be optimised to match that of the driver across several octaves, resulting not just in higher efficiency but also in better dynamic power transfer from the amplifier..

This better matching achieves two important benefits, firstly the efficiency is greatly increased and secondly, the resistive termination presented to the diaphragm reduces the amplitude of any response anomalies.

The greatest problem of horn loaded systems is physical size. For a simple horn the lower cut-off frequency is directly proportional to the effective diameter of the mouth when radiating into free space, for example a cut-off frequency at - 3dB of 50Hz would require a horn mouth area of 3.8 square meter!!

Clearly unsuitable for most domestic purposes.

The most important consideration must therefore be to first reduce the size requirement whilst maintaining the low frequency response. To do this the rear of the diaphragm needs to be loaded by an inductive impedance component. This can be designed by re-configuring the parameters of the horn flare to off-set the increasingly capacitive throat impedance below the cut-off frequency. This, in combination with a speaker position that takes advantage of close proximity to room boundaries (wall or corner) reduces the radiation impedance further. With corner positioning the bass horn mouth area is effectively increased by a factor of x16 or x8 when placed against a wall, providing a substantial boost at low frequencies.

In the Audio Note™ AZ-One Quasi horn, rear diaphragm radiation is controlled by critically positioned acoustic impedance matched foam, further aiding low frequency performance by levelling out the amplitude of standing waves.

ROOM PLACEMENT.

In common with our more conventional ported speakers, the Zero AZ Series speakers are designed to be placed very close and at an angle to a rear wall or preferably with the rear horn mouth firing assymetrically into a corner close to

the side walls, this positioning has been chosen because being a horn it improves bass response and low frequency cut off for reasons already discussed.

It is vitally important to understand that the proximity of the AZ-One to the rear wall or corner, if you experience problems with the bass, try moving the speaker closer to the wall, or try to change the angle of the speaker.

The best performance is achieved by corner placement and if placed in a corner, the AZ-One should be angled so that the on-axis line of the drive units crosses about 1 - 2 meters in front of you, with the back corner of each speaker almost touching the side wall (see diagram 1). Even in a hotel room it is possible to reduce the boom and bass resonance to a more than acceptable minimum, whilst still retaining good attack and depth of bass.

If only a rear wall is available, it is still possible to get a fine boom-free bass response, and experimenting with the angle and distance to the rear wall is absolutely necessary inorder to get a good result. The inside rear corner of the speaker can be very close to the wall, as little as 5 centimeters is acceptable, with the speakers placed as far apart as the room allows, (see diagram 2.).

With only a wall behind the speakers the bass output will roll off quicker than in the corner position, as the acoustic amplification provided by the room boundary (the wall) is less than half of that of the corner.

GENERAL.

As with most Audio Note™ product concepts, this design philosophy is in stark contrast to conventional speaker design dogma which creates speakers that as a main placement consideration dictates that the speaker should be as far away from reflecting walls as possible, a design philosophy which in my opinion is as illogical as it is unpractical, all rooms have walls, so you might as well design them into the equation when looking at the time constants between the direct versus the reflected sound and the rooms main resonans modes which are only excited more by generating the sound far from the walls, in addition to the fact that having speakers placed in the middle of the room is physically obtrusive and does not endear your partner to your music system.

So to briefly sum up the advantages of placing the speakers near the room boundries,

A.) Improves room compatibility (variation in sound from room to room) by minimising the speaker's sonic variability to different rooms, being close to the room boundaries gives a far more predictable relationship between direct and

reflected sound and in addition reduces the influence of the room's standing wave behaviour.

B.) Improves bass response, by reinforcement against room boundaries, which makes it possible to, by adjusting speaker's distance from the wall/corner, regulate the bass quality/quantity to further minimise room influence on the sound.

C.) Wall or corner positioning makes the speakers less obtrusive in most room settings.

The exceptional dispersion performance of the drivers which is further supported by the crossover network allow for considerable flexibility of listening position by creating a wide, deep and high listening "window" and by maximising the coupling between horn and room creates an acoustic pressure behaviour similar to that of live instruments bringing you closer to the musical event.

The AZ-One loads its 5 inch paper cone driver with a quasi quarterwave horn and combines this with a 3/4 inch dome tweeter and an efficiency of around 93dB, in a 90 cm high floorstanding dynamic speaker, initially available in black satin finish only.

The Zero Series speaker range currently consist of 3 models, the AZ ONE (91dB), AZ TWO (93dB) and the AZ THREE (94 dB+).

As with our existing speaker range we have spent a lot of time making sure that the power transfer interface between the amplifier (The P ZERO's, naturally, but also our other low power amplifiers such as the OTO, MEISHU and Conqueror) and the AZ speakers' load to maximise the acoustic power output to the greatest possible extent and it is important to appreciate in this regard that good efficiency ratings are one thing, but in themselves they are no guarantee that you are able to play loud with a small amplifier; this requires good wideband dynamic acoustic output conversion to input power applied through the crossover to the drivers and that is quite another matter which the common efficiency rating does not adequately describe, and the AZ TWO really does go loud with the 8 watts of the P ZERO's.

Specifications for the AN AZ-One,

Dimensions	Height 800 mm, width 230 mm, depth 280 mm
Sensitivity	91 dB at 2.83 volt @ 1 meter
Impedance	6 Ohms nominal

Crossover Frequency	2.8 KHz
Finish	Black Ash, Rosewood, Cherry or Beech
Weight	11 kgs

UPGRADING.

Any member of the Audio Note™ AZ-speaker range is easily upgraded, the copper AN-D internal cable can be changed to AN-SPa silver cable or a better variety of Audio Note™ silver speaker cable.

The standard crossover compliment consists of a pair of chokes wound with copper wire, these can be exchanged for a silver wired version (this will be quite expensive), and a pair of bipolar electrolytic capacitors which can be upgraded to Audio Note copper foil paper in oil caps of the same value (1 x 4.7mF/50 volt and 1 x 6mF/50volt), which will be a considerable improvement and cheaper than the silver chokes.

All Audio Note™ products are designed with upgrading in mind, this is a central part of any product specification/design, and allows you, our customer, to improve your purchase over time, hopefully improving your enjoyment of and interest in reproduced music.

Peter Qvortrup
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