

# ALTERNATE TUNING

Model HDT206EM

*High Definition Loudspeakers*

## ALTERNATE TUNING GUIDE

Since the release of the HDT loudspeaker design in 2003 we have come up with what we feel is a substantial improvement in overall performance of the HDT loudspeakers. If you've researched the design you know it was originally developed as a two-way loudspeaker in 1996 using a conventional 8 inch driver and 1 inch tweeter. When the design was adapted for the Fostex FE206E driver in 2003, the tuning of the ports and passives was raised to accommodate the higher fs. This allowed the cabinet and Fostex to work together and with the addition of our Phase Guide to the driver the end results were quite good.

We found while comparing the original 1996 speaker with the HDT that the higher tuning of the ports and passives reduced the fundamental operation of the multi-chamber design. In the original speaker there is no treatment inside the enclosure or any of it's chambers yet it has the most liquid midrange you've ever heard. The Fostex based HDT on the other hand was more congested. It saw most of it's loading from the primary chamber leaving the secondary and averaging chambers doing little work and hence emitting little energy. This prevents the speakers from doing as good a disappearing act as the original 1996 model.

Since the cone of the FE206E driver is so thin it is important when you build a pair of HDT speakers to know exactly how to treat it and with what. This paper will describe the proper procedure for treating the inside of the cabinet. It will then cover the optional alternate tuning that we suspect will be received as a significant improvement even though we can find nothing bad written about the 200 pair that have been built to date.

The alternate tuning is optional because many will be perfectly fine with the way they sound now. And it requires an additional modification to the drivers, new passive radiators and different length ports. The ports can be easily modified once the driver and both passives have been removed from the cabinet.

The alternate tuning when combined with the correct treatment of the inside of the enclosure will result in a significant increase in bass and extension of bass frequencies. It will remove the congested sound in the midrange and treble and activate the complex beauty of the enclosure design to make all the chambers work resulting in a head shaking disappearing act.

## CABINET TREATMENT

The material used for all internal cabinet treatment is 1 inch thick egg crate foam like that used as mattress toppers. You can find it at Wal-Mart, Target, and most fabric stores.

After you have removed the driver and both passives, or when you are building the cabinet new you should install this foam in specific places, cutting each piece for a snug fit.

Piece 1 is a 12x12 square that fits in the bottom of the averaging chamber. It can be installed though the square port in the lower rear of the cabinet or from the top through the transmission line.

Piece 2 is a 16x7 rectangle that fits on the rear panel behind each passive opposite the oval cut-outs. It should be pushed to the top of the chamber. You will have one of these pieces for each side of the enclosure.

Piece 3 is a triangle that fits in the top of the primary chamber above the driver.

Piece 4 is a 4 inch strip that mounts under Piece 3. It should be cut to a length to cover all three sides of the primary chamber.

Piece 5 is cut to match piece 4 and located just below the driver opening where as piece 4 is located just above the same opening. Piece 5 will also just cover the bottom of each oval cut-out so it should be notched so as not to obstruct the opening.

## DRIVER MODIFICATION

The driver should be returned to Decware for a special viceelastic wax glaze on the cone which lowers Fs slightly and improves midrange.

## PASSIVE RADIATOR REPLACEMENT

The passives should be replaced with the alternate design available from Decware.

## PORT LENGTH MODIFICATION

Front port should be lengthened from 6 to 11 inches and the side ports lengthened from 8 to 17 inches. Use PVC

## HDT ALTERNATE TUNING—CONTINUED

The alternate tuning for the HDT loudspeakers will become standard in the Fall of 2005 after it is debuted at our October DecFest.

A kit will be available that includes the following:

1. 6) 2 inch PVC port tubes with couplings for lengthening the ports. This can be done once the passives and main driver have been removed without tools and is reversible.
2. 4) Alternate design passive radiators. These replace the original passives and are glued in just as they were. This mod is also of course reversible.
3. 12) pre-cut pieces of foam used for internal reflection control. Replaces felt previously used. This mod can remain even if the other mods are reversed.

The final stage will be having the drivers modified with gel wax to drop the fs and fully active the mods listed above. This mod is not reversible. You can either purchase a new pair of drivers from Decware with the gel wax mod, or send your original drivers in for upgrading.

Prices for these mods will be listed on the Decware web site in the HDT pages when they become available.

### FREQUENTLY ASKED QUESTIONS

**Q)** Can I ship my HDT's back to Decware for these mods?

**A)** No. Shipping these speaker cabinets back to Decware ensures a 70% chance they will be damaged or destroyed by UPS. It's just not worth the risk. You can drive them to our cabinet facility in Mesa AZ or to our amplifier facility/home office in Peoria IL if you want. Bob or Steve will be happy to upgrade them. Upgrading them yourself is easier than it sounds. You can also consider having a friend come over to help you.

**Q)** Can I mod my HDTs without the updated passive radiators?

The updated passives applied to the standard HDT's without any of the other mods will not adversely effect performance or fidelity.

**Q)** Can I apply all of the mods but continue to use the original drivers?

**A)** Yes. The sound of the original drivers will not suffer from the mods. The gel wax modified drivers will however take advantage of the mods to a far greater extent.

**Q)** Can I have my original HDT drivers modified with gel wax and forget the other mods.

**A)** Yes. You will hear an improved midrange with slightly more bass and about 1 dB less overall efficiency. However, implementing the other mods will greatly enhance it's sound by further improving the midrange, lowering the bass and significantly improving the imaging.

**Q)** Will the lower bass response and added weight take away from the speed of the bass – I really like the HDT bass the way it is.

**A)** NO. It will be just as fast, but come off slightly warmer and deeper.

#### CAUTION:

The HDT loudspeakers have a solid reputation among serious audiophiles in their standard configuration. If you own a pair and simply love the way they sound you should consider leaving them alone. The updates will add more weight and bass response which could tip the delicate balance you may have achieved with the rest of your system and room. We expect that in most cases the alternate tuning will be perceived as better but there will always be exceptions.

We have been field testing the alternate tuning all year with various HDT owners and the improvements so far have been 9 out of 10 thought it was an improvement. With that in mind, if you love the way your HDT's sound now, there is a 10% chance they will sound worse after the mods.

Of course, the worst case scenerio would be you falling into that 10% in which case you could reverse the mods. If you purchased a second set of drivers with the gel wax and still have your original drivers, reversing the mod would be fairly painless.

HDT LOUDSPEAKERS are manufactured in the USA by

***DECWARE High Fidelity Engineering Co.***

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[www.decware.com](http://www.decware.com)