

## Technical Note

Title: Shun Mook Mpingo™ Discs Acoustic Test

Filename : HK-TN-0388- Shun Mook Mpingo™ Discs Acoustic Test -LH

Date: 29<sup>th</sup> June, 2010

Author: LH

Approved by : BL

Date : 29<sup>th</sup> June, 2010

### **Abstract:**

The objective of this paper is to measure the acoustic characteristics with and without Shun Mook Mpingo Discs (SMD as follow) under the same HiFi setting.

3 SMDs were put in the domestic environment under Shun Mook Instructions and the Sound Pressure Level (SPL as below), Phase and harmonics were measured. The 2-D Waterfall diagram was adopted to determine the output reverberate time (RT60).

Measurable and repeatable result can be made by acoustic equipment. 3 SMD enhance the harmonics effect in the audio band. Over the past 30-year practical experience from the Shun Mook founders, Shun Mook Mpingo discs were created and applications of them were developed in order to reinforce the analog sound by special structure of Ebony and tweaking the SMD.

There are series of instructions of application of SMD. However, instruction 8, Simplified Spatial Control was selected to test the SMD effect on acoustics. The placement of SMD in the HiFi setting was recommended by the Shun Mook founders.

The results of measurement show the enhancement on RT 60 and harmonic reinforcement.

## Technical Note

### **Sample Nos (if applicable):**

**3 samples provided from Shun Mook Audio Inc, received on 18<sup>th</sup> May, 2010**

**360 Grand Avenue #310 Oakland, California 94610 U.S.A**

**Tel : +1 510 839 6857**

**Fax : +1 510 839 0080**

**Website : <http://www.shunmook.com>**

**Email : [shunmook@gmail.com](mailto:shunmook@gmail.com)**

## Technical Note

### General Description of Shun Mook Mpingo™ Discs

The Mpingo Disc is invented by the Shun Mook team. It is made from a combination of Gaboon and Mpingo Ebony, treated with a proprietary process that gives the disc a unique property to regulate the resonance of any sonic component and its transmission. Yet this is a very simple item to use. Just place one to three discs on top of your preamp, CD transport, DA converter, turntable etc, and listen for the wonderful change in your Hi fi system. When this disc is excited by any external acoustic energy, it will resonate throughout the entire audible spectrum, thus overriding unwanted harmonic distortions and at the same enriching the musical reproduction.

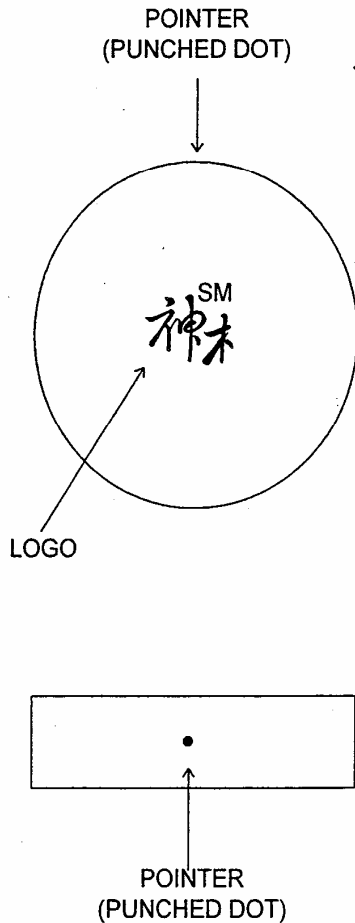
### Photo of Product

Figure 1. Shun Mook Mpingo™ Discs with packaging



## Technical Report

# Applications of Shun Mook Mpingo™ Disc



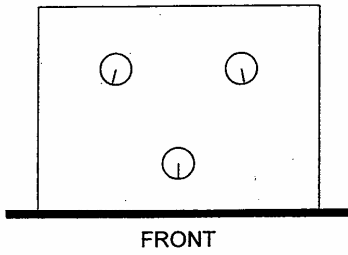
### INTRODUCTION:

The Shun Mook Mpingo Disc are individually aligned with an inscription (logo) when formulating the divine wood for its special orientation. This is indicated by a punched dot on the side of the disc we call "Pointer". In general, the logo should face towards the equipment or space you intend to control, i.e. face down on the cover of the chassis of an amplifier.

You can adjust the tonal balance by turning the Mpingo Disc using the "Pointer" as an indication like the dial on a clock's face. Usually, if the Mpingo Disc is placed in a triangular position on top of an equipment, dialing it clockwise will increase the low frequency energy and rotating it counter-clockwise boosts the high frequency range.

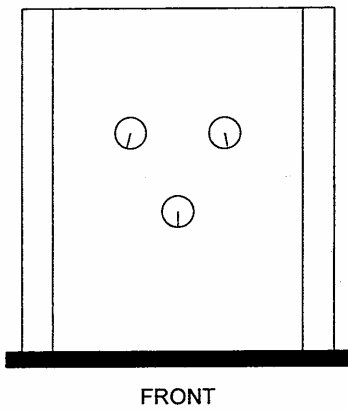
Rotating the two discs at the base of the triangle will affect frequency response. That means, turning the right disc clockwise and the left disc counter-clockwise (toe-in) will boost the high frequency and vice-versa. Each adjustment requires only moving the disc one hour (15° angle) dial position.

# Technical Report



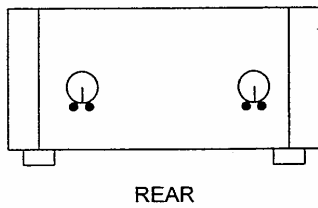
## 1. PREAMPLIFIER

Position the Mpingo Discs in an equilateral triangle 8 inches apart with the direction of the pointers facing as shown in the 5, 6, & 6 o'clock directions. The logo should be facing down.



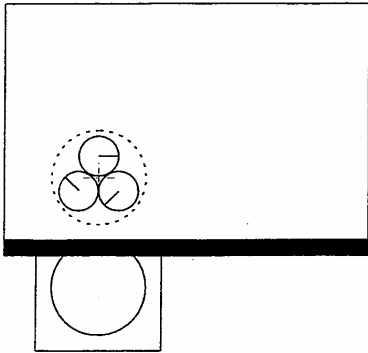
## 2. POWER AMPLIFIER

a. Position the Mpingo Discs in an equilateral triangle 8 inches apart, as shown, logo facing down.



b. On the binding post, the logo should be facing the Amplifier in a 6 o'clock direction. (Pointer down)

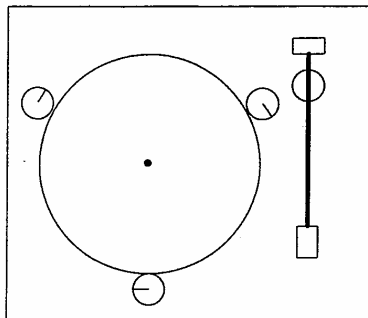
## Technical Report



PLAN

### 3. CD TRANSPORT:

Find the center location of the spindle, then place three Mpingo Discs with their pointers aiming in a direction tangent to the spindle. The logo should be facing down.

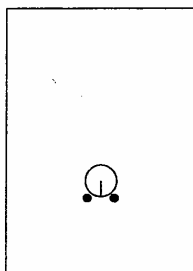


PLAN

### 4. TURNTABLE:

Put three Mpingo Discs in a triangular position around the platter on the chassis, with the logo facing down. The direction of the pointers should be tangent to the (turning radius) rim of the platter.

Also, an additional Mpingo Disc on top of the armboard or tonearm support will help in the definition of the performance. Standing on its edge, logo facing front, with pointer at 12 o'clock.

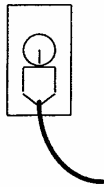


REAR

### 5. SPEAKER BINDING POST:

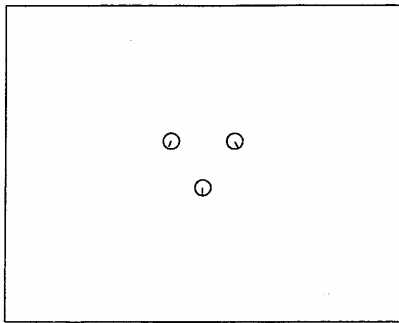
The pointer on the Mpingo Disc should be in the 6 o'clock position with the logo facing the speaker.

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## 6. POWER RECEPTACLES:

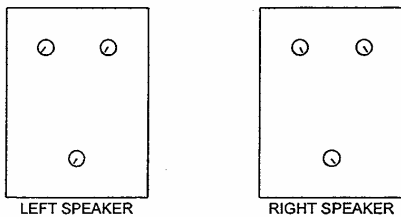
The Mpingo Disc should be positioned on top of the plug with the logo facing the wall. The pointer should be pointing down in the 6 o'clock position.



## 7. SUBWOOFER:

On top of the subwoofer, position three Mpingo Discs in an equilateral 8" triangle with the pointers in a 7, 6, & 5 o'clock position. To tighten the base, one could close in the triangle. Each step of adjustment requires only half inch movement. The smaller the triangle, the tighter the base, and vice-versa. The logo should be facing down.

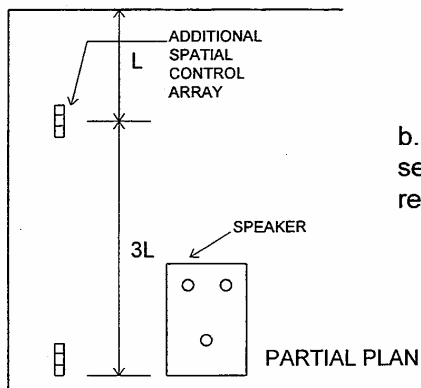
PLAN



## 8. SPATIAL CONTROL:

a. Two more Mpingo Discs can be placed on top of each speaker in addition to the one already there. The logo should be facing down. Orientation of pointers should be as shown. Pointers on the left speaker should be at the 7 o'clock position, and pointers on the right speaker should be at the 5 o'clock position.

TOP VIEW



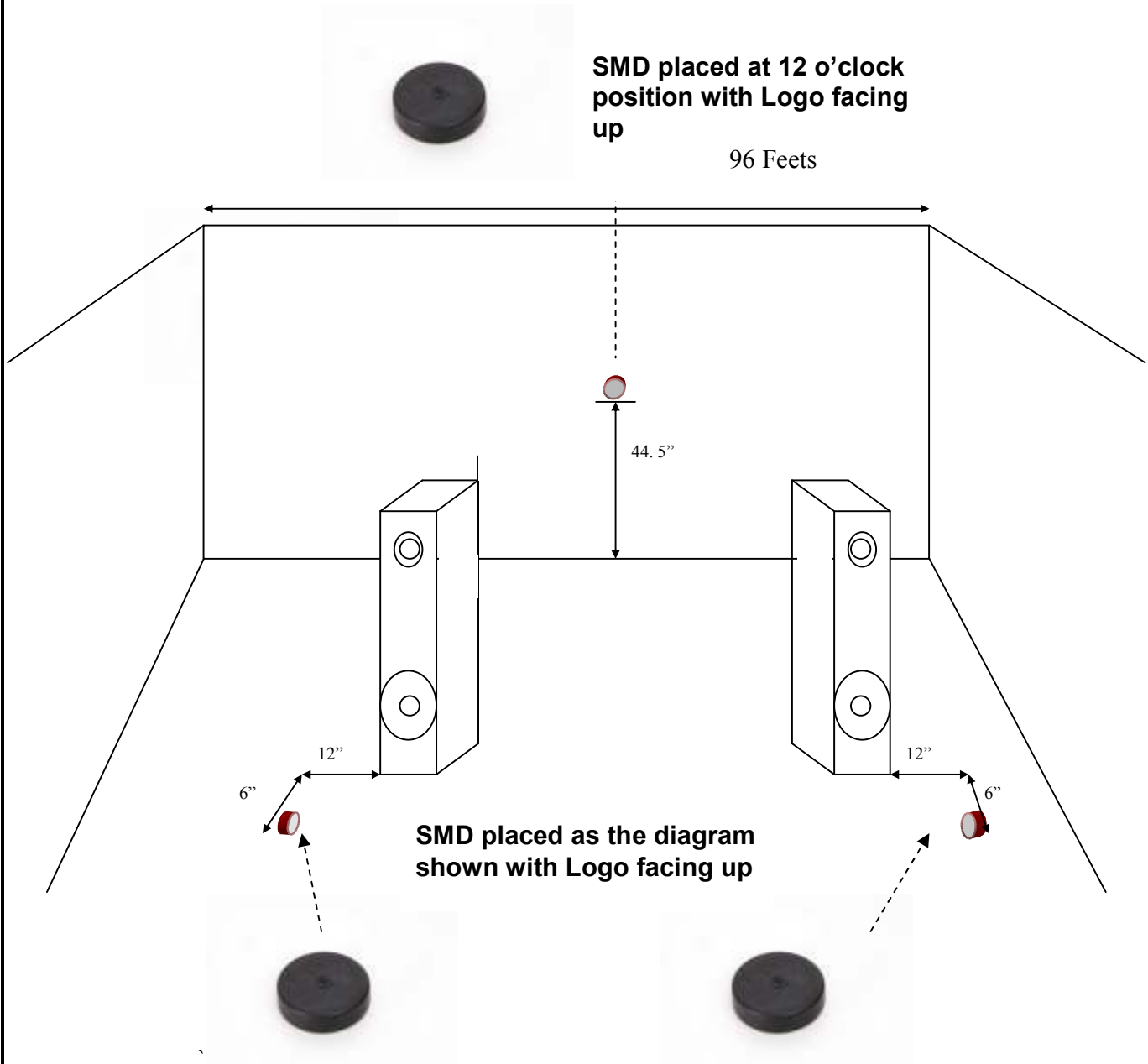
b. Adding two extra sets of 3-Disc holder at the second reflection points as shown, will expand the rear portion of the sound stage.

# Technical Note

## Setup & Placement:

Measurement Equipment	<ul style="list-style-type: none"><li>➤ Clio 6 PCI standard Version ( Calibrated microphone )</li><li>➤ XTZ Room Analyze</li></ul>
Speaker	<ul style="list-style-type: none"><li>➤ Eton 7" Bass/Mid Unit</li><li>➤ Accuton ceramic Tweeter</li></ul>
Amplifier	<ul style="list-style-type: none"><li>➤ Full Balanced Power amp (240W@8ohm@1kHz)</li></ul>

**Figure 2. Replacement of 3 Shun Mook Mpingo™ Discs in 250 Feet sq room**





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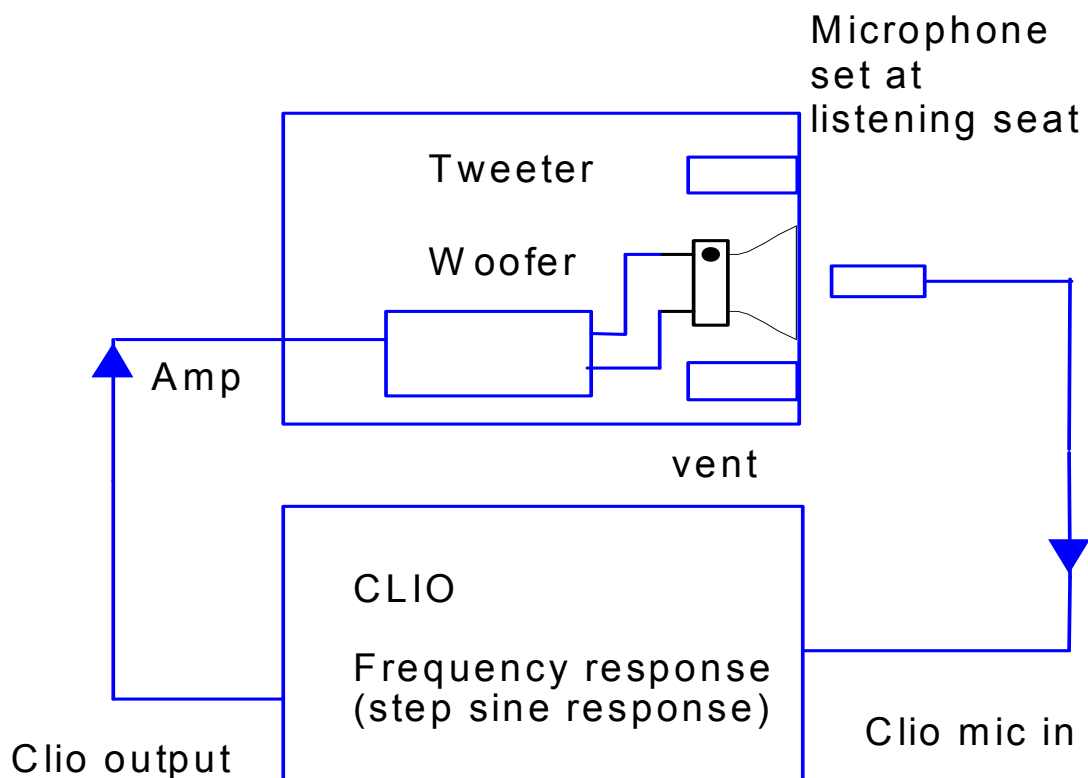
### Test 1 – Sympathetic Resonance

For testing “Sympathetic Resonance”, 3 Discs have non direct contact with the testing equipment, only existence and taking out of the listening space to test the acoustics effect of 3 discs base to simplified application 8 methods (Spatial Control).

One disc put on middle in between of 2 speaker of rear wall middle in between of 2 speakers (Center of the listening position). Another discs put on the floor which close to the outer front corner of the speakers

#### Test 1. Sweep Test from 60Hz to 22KHz

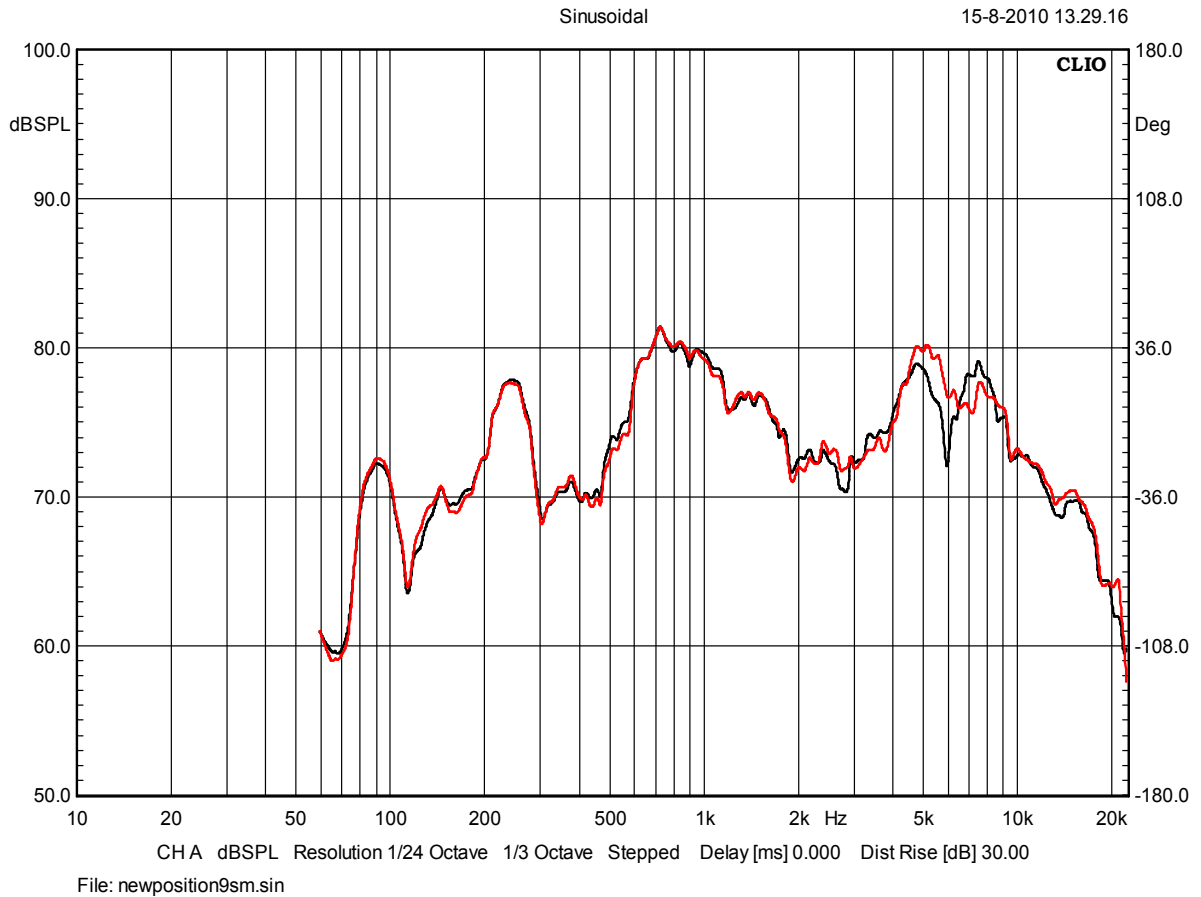
**Figure 3. Setup of Equipment**



Measurements were made at 1W into 8 ohm nominal (2.83V) with microphone at 2 meters.

# Technical Note

## Figure 4. Harmonics Measurement



*The frequency response was measured at my golden seat position. The red line represents the setting without SMD involvement while the black line represents the setting with 3 SMD involvement.*

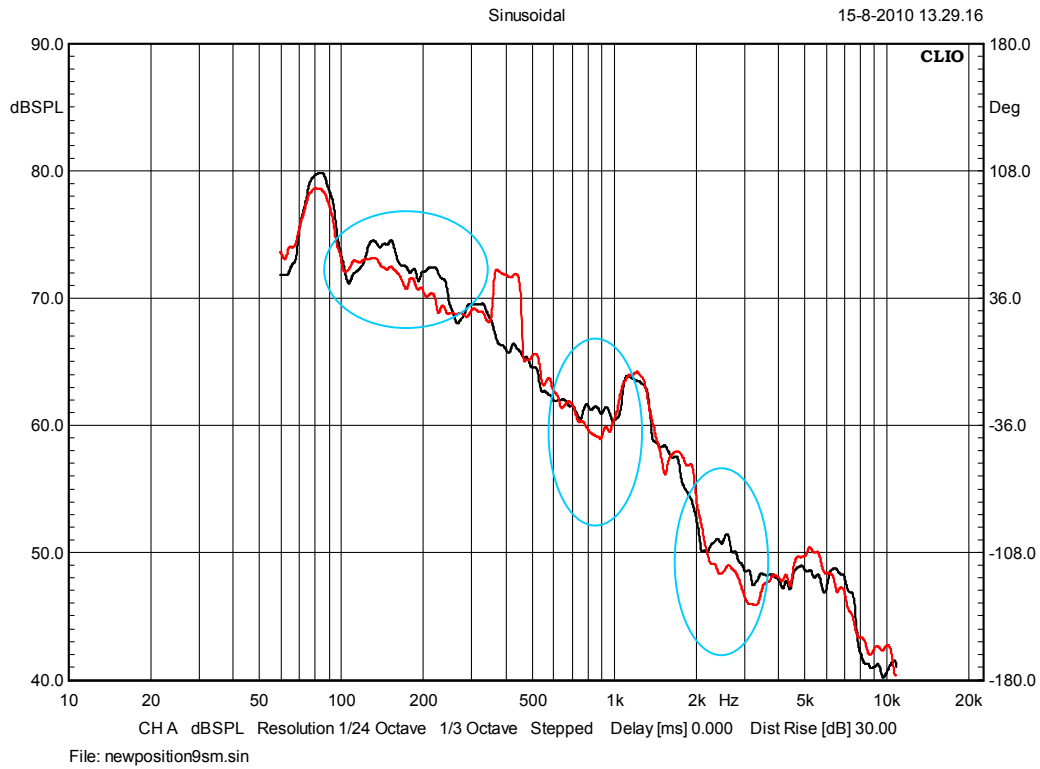
### Conclusion:

There is no much difference in the fundamental frequency. However, the following measurements show a big difference in harmonics.

# Technical Note

## Test 2. Same SPL measurement for Harmonics Analysis.

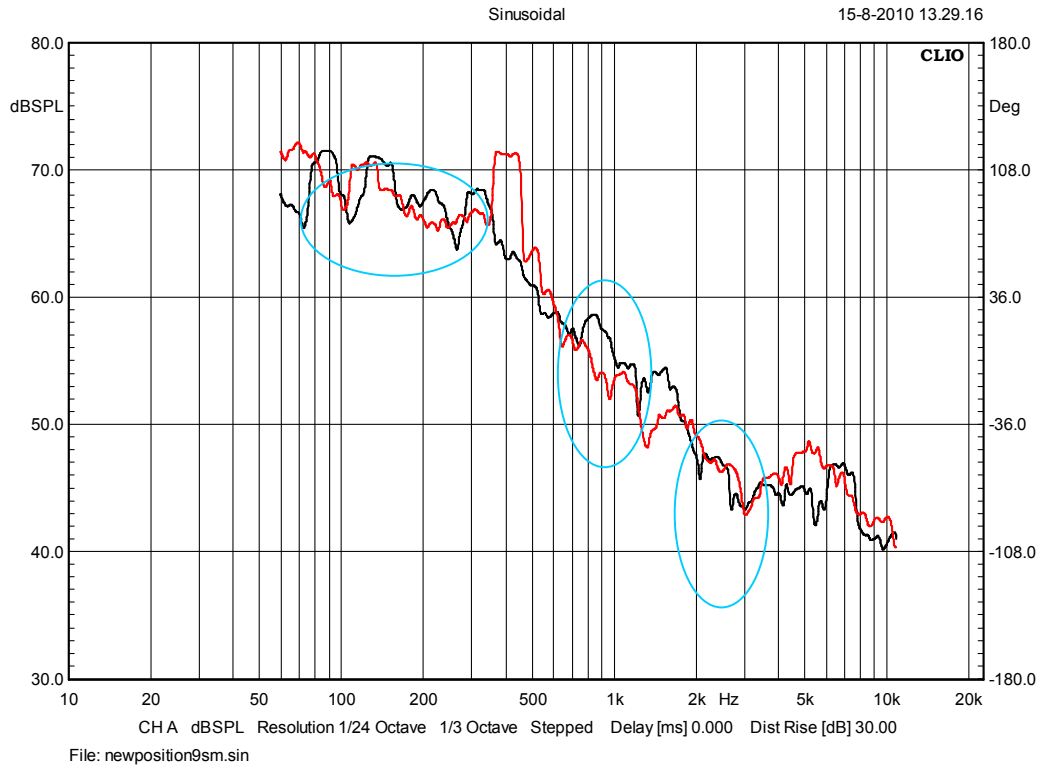
**Figure 5. Total Harmonics (1<sup>st</sup> + 2<sup>nd</sup> + 3<sup>rd</sup> + 4<sup>th</sup> + 5<sup>th</sup>) Analysis (+30dB Rise)**



*The red line indicates there is no SMD involved while the black line indicates 3 SMD involved. The blue circles indicate there is big different harmonics in the setting with and without SMD.*

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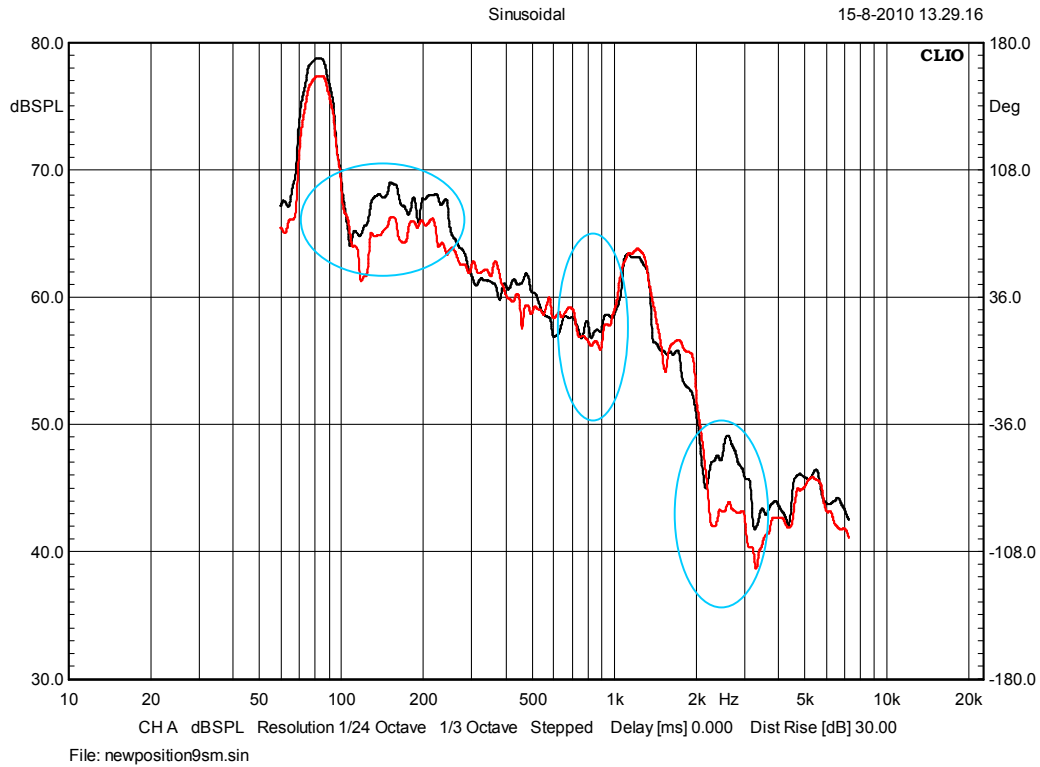
## Figure 6. 2<sup>nd</sup> Harmonics Analysis. ( +30dB Rise )



*The red line indicates there is no SMD involved while the black line indicates 3 SMD involved. The blue circles indicate there is big different harmonics in the setting with and without SMD.*

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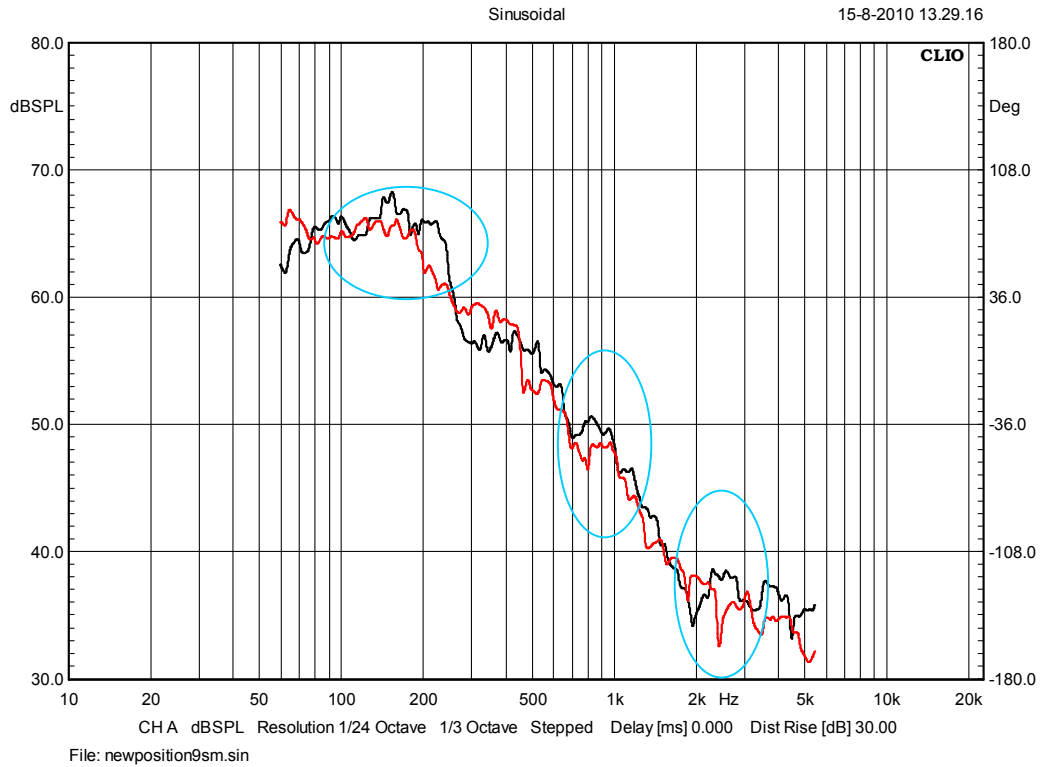
## Figure 7. 3rd Harmonics Analysis. ( +30dB Rise )



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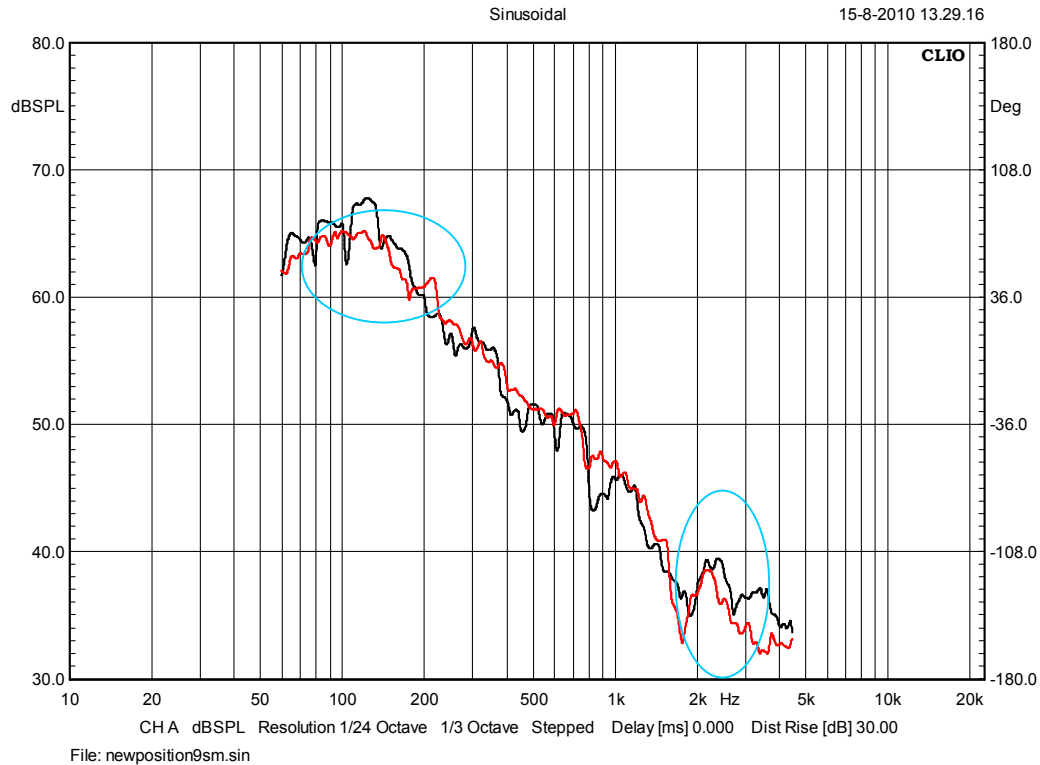
## Figure 8. 4th Harmonics Analysis. ( +30dB Rise )



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# Technical Note

**Figure 9. 5th Harmonics Analysis. ( +30dB Rise )**



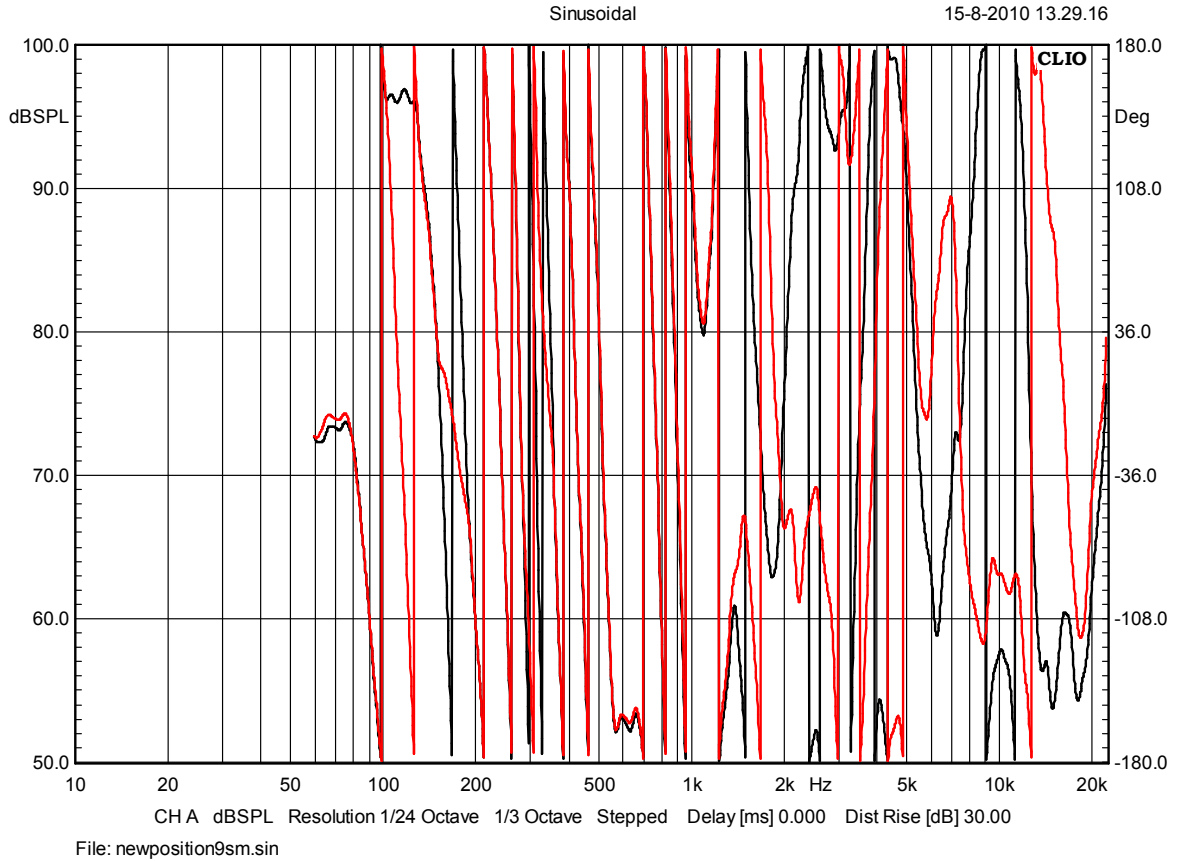
*The red line indicates there is no SMD involved while the black line indicates 3 SMD involved. The blue circles indicate there is big different harmonics in the setting with and without SMD.*

## Conclusion:

From the 2<sup>nd</sup> to 5<sup>th</sup> Harmonics Analysis (Fig. 5 to Fig. 9) shows the black line curve level is than that of the red line curves in 3 regions which are from 80Hz to 200 Hz, from 800Hz to 1kHz and from 2kHz to 3.5kHz. This implies that SMD can make a higher output level. Thus, SMD reradiate more harmonics and enrich the sound to become richness, fully body and comfort.

# Technical Note

## Figure 10. Phase difference



*Red line in indicates there is no SMD in the setting while black line indicates there are SMD involved.*

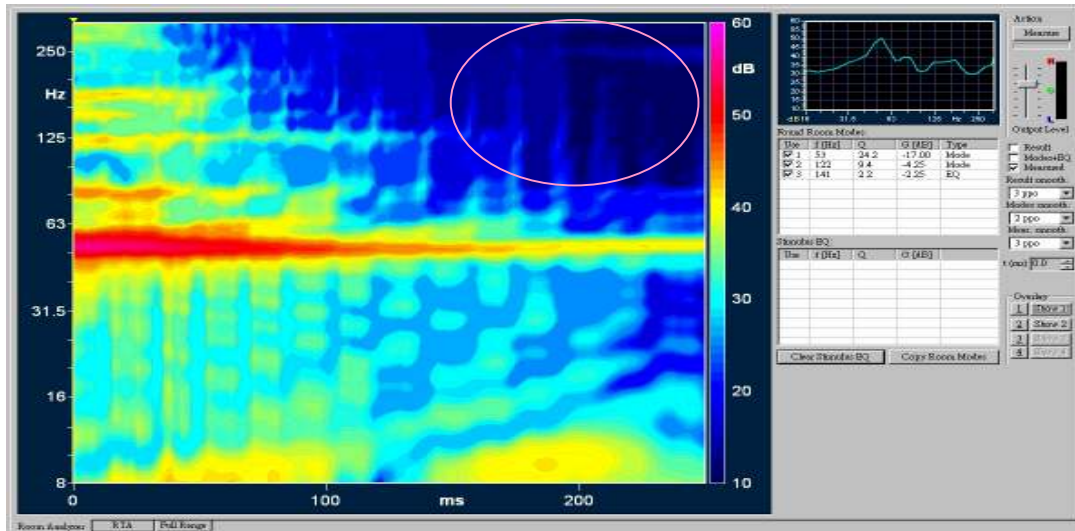
### Conclusion :

There is less phase change on the black line so this can be concluded that more coherence would be resulted after applying SMD in the audio band.

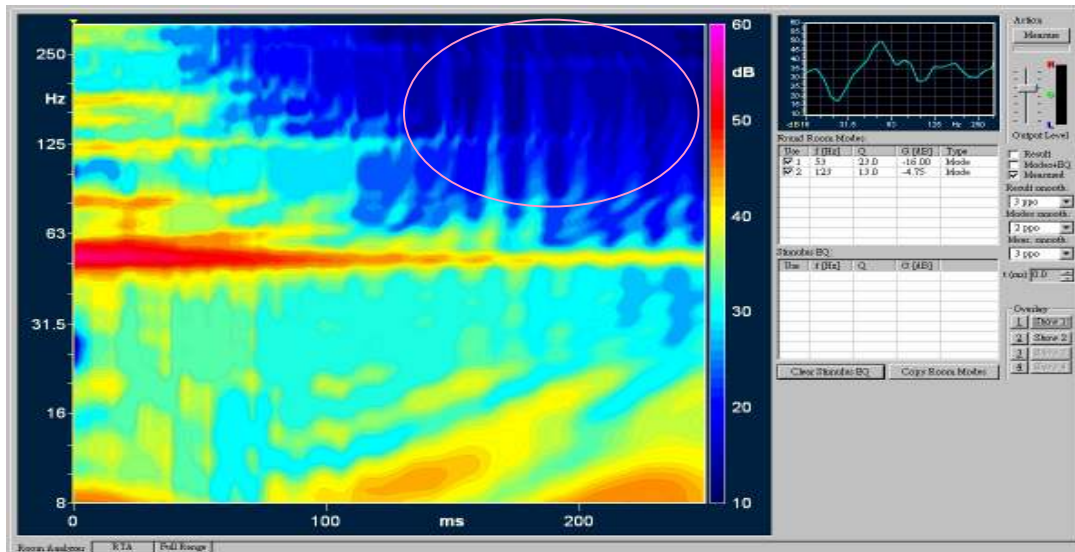


# Technical Note

**Figure 11. 2D Water Fall Measurement (No SMD Placement)**



**Figure 12. 2D Water Fall Measurement (With SMD Placement)**



*The reverberations in Fig.11 appear less than that in Fig.12.*

## Conclusion:

Reverberations in Figure 12 more evenly and frequently appeared. This implies that 80Hz to 300Hz, SMDs are excited to provide ~5dB @ 120ms to 250ms. This makes the room's acoustic lively and longer reverberations.

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### **Summary:**

Not only do the measurements show the differences between with and without SMD placement, but also the listening tests. The audible differences were obviously observed. With the SMD involvement, spacious and lively sound is generated. SMD can diffuse sound and reflect the sound in a variety of directions. This allows a listener to perceive sounds from every part of the room, making it seem lively and full. Shun Mook also have other products for enhancing room performance.

### **Remark:**

“Sympathetic Resonance”. As all elements in this universe will resonate when like pattern energy is generated from another material. Just as in a physics experiment when you excite a metal tuning fork of say the "A" frequency and hold it close to another static "A" tuning fork. The result is that the second tuning fork will also get excited because same frequency energy is transferred through the air to cause the vibration. Thus when the musical energy produced by any Hi Fi system will excite to different degree of all materials within the space covered by the acoustic spectrum. Different materials will have a positive or negative effect on each other influencing the final music production. The secret is to control and tame such resonance to the advantage of the system.

It is commonly known that many musical instruments uses Mpingo and other ebony wood to create the most natural musical tones and harmonics. Just like the clarinet, the violin and other wind and string instruments uses the ebony as the essential component to generate the sound. “

## Technical Note

### **Reference:**

High Performance Loudspeakers Third Edition - Martin Colloms

[CLIO application: Room and Building Acoustics -  
http://www.audiomatica.com/techresources.htm](http://www.audiomatica.com/techresources.htm)

<http://www.shunmook.com/text1.htm>

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### Photo of Product

Figure 1. Shun Mook Mpingo™ Discs with packaging



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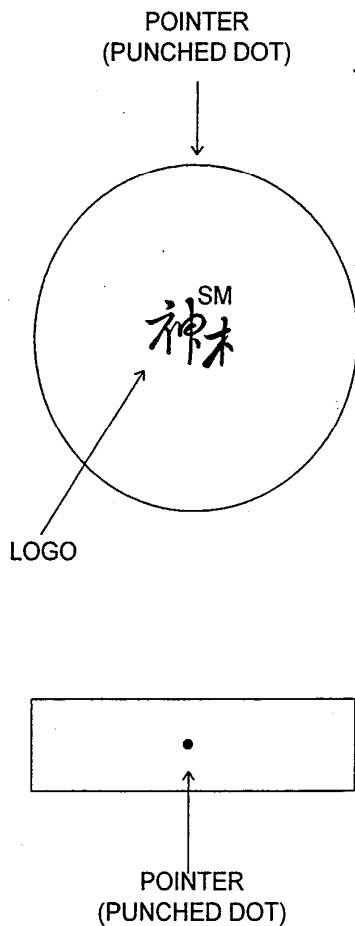
## Applications of Shun Mook Mpingo™ Disc

### INTRODUCTION:

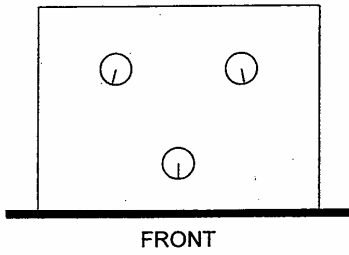
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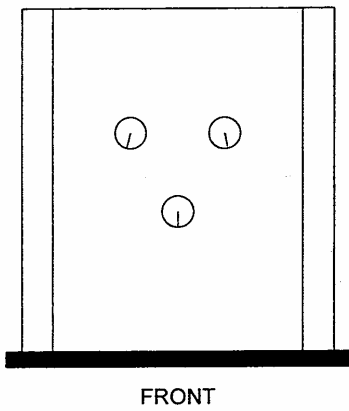


# Technical Report



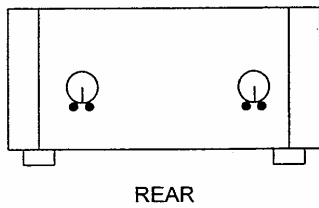
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## 2. POWER AMPLIFIER

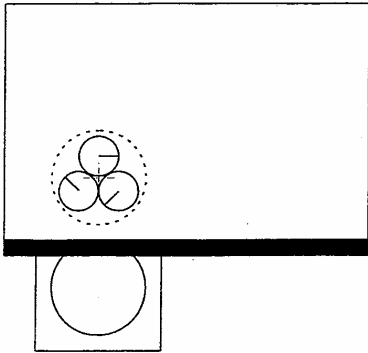
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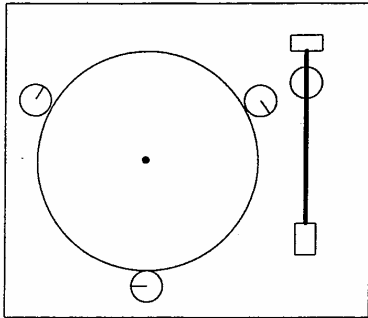
## Technical Report



PLAN

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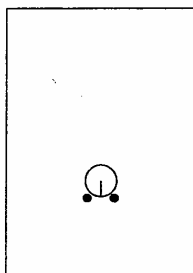


PLAN

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Also, an additional Mpingo Disc on top of the armboard or tonearm support will help in the definition of the performance. Standing on its edge, logo facing front, with pointer at 12 o'clock.

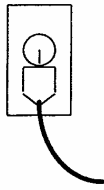


REAR

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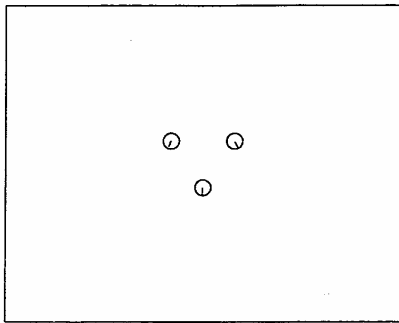
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# Technical Report



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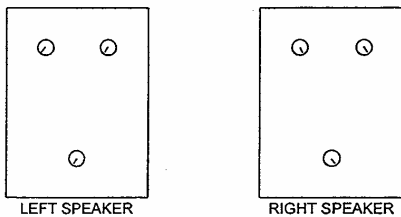
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PLAN

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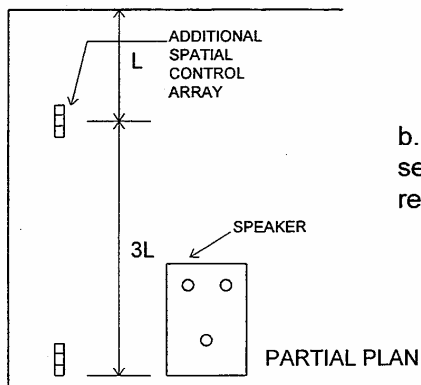
LEFT SPEAKER

RIGHT SPEAKER

TOP VIEW

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a. Two more Mpingo Discs can be placed on top of each speaker in addition to the one already there. The logo should be facing down. Orientation of pointers should be as shown. Pointers on the left speaker should be at the 7 o'clock position, and pointers on the right speaker should be at the 5 o'clock position.



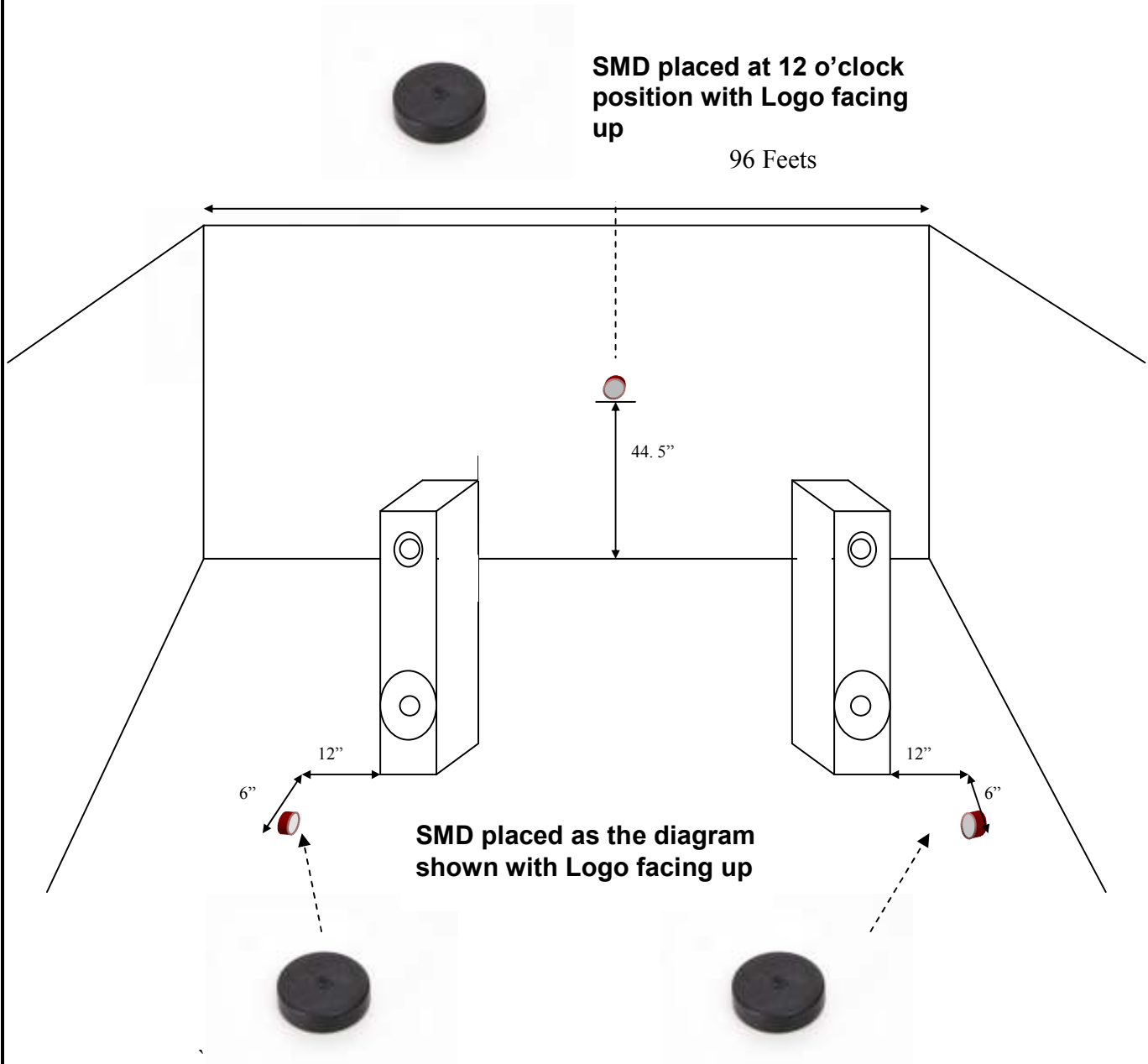
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**Figure 2. Replacement of 3 Shun Mook Mpingo™ Discs in 250 Feet sq room**



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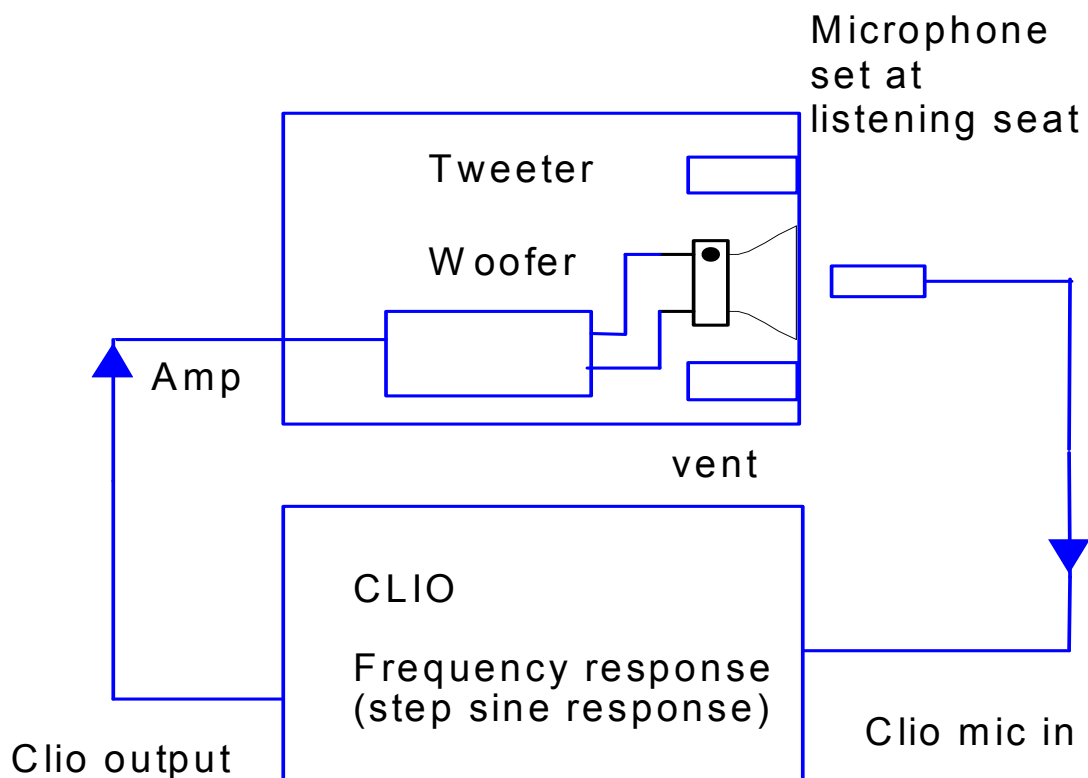
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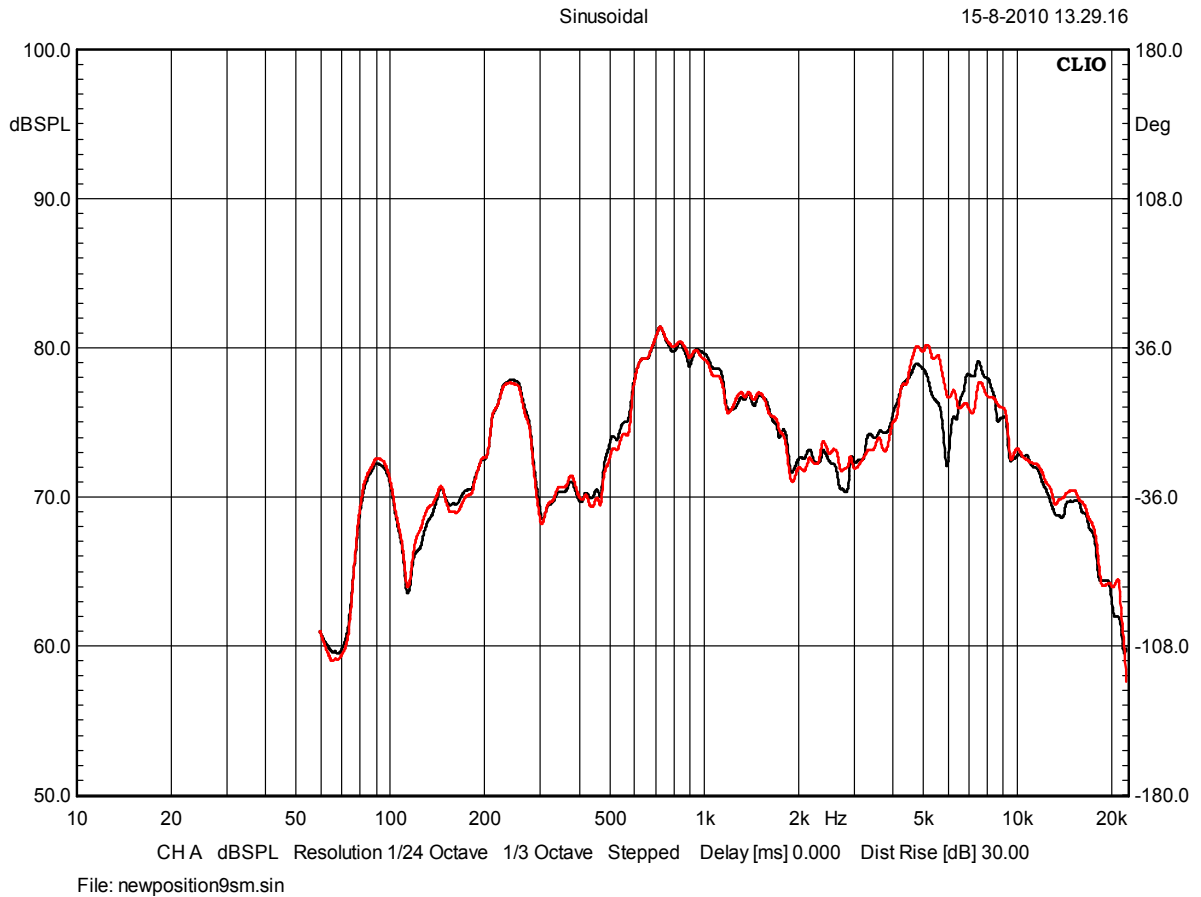
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## Figure 4. Harmonics Measurement



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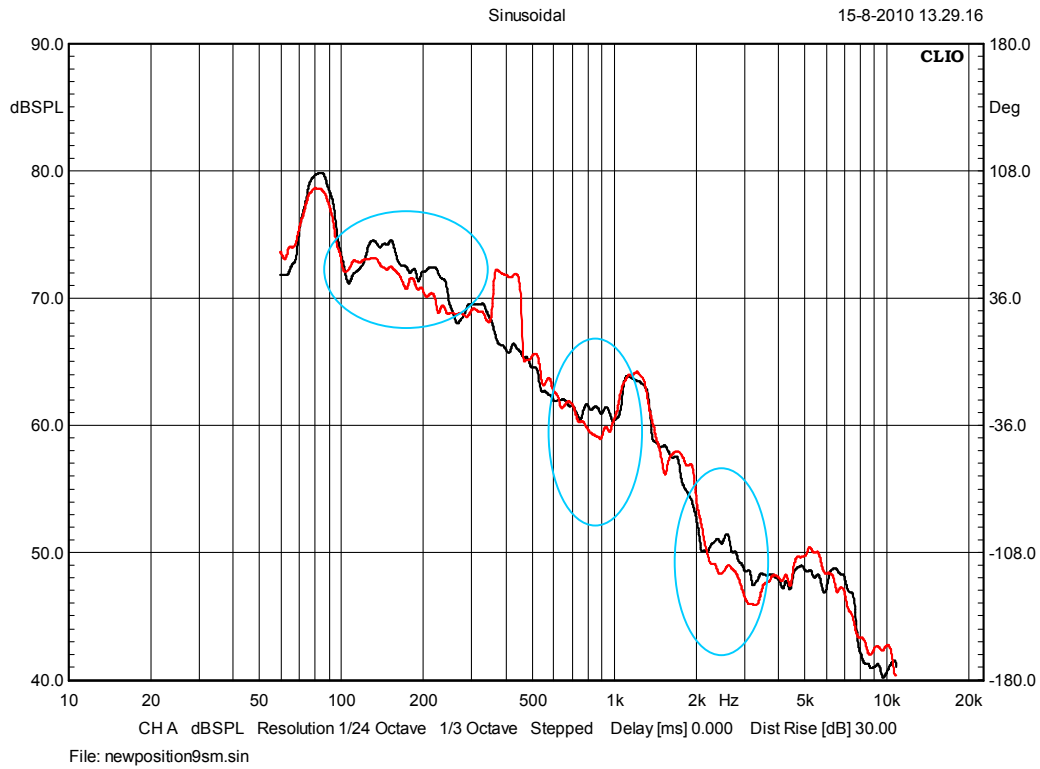
### Conclusion:

There is no much difference in the fundamental frequency. However, the following measurements show a big difference in harmonics.

# Technical Note

## Test 2. Same SPL measurement for Harmonics Analysis.

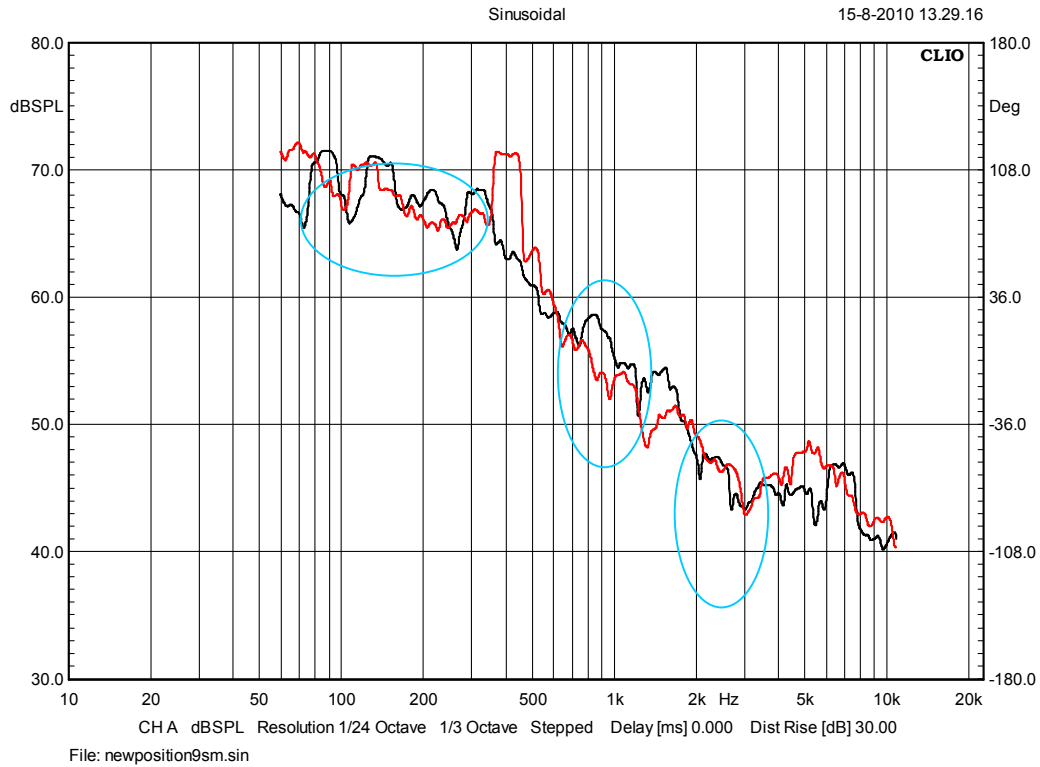
**Figure 5. Total Harmonics (1<sup>st</sup> + 2<sup>nd</sup> + 3<sup>rd</sup> + 4<sup>th</sup> + 5<sup>th</sup>) Analysis (+30dB Rise)**



*The red line indicates there is no SMD involved while the black line indicates 3 SMD involved. The blue circles indicate there is big different harmonics in the setting with and without SMD.*

# Technical Note

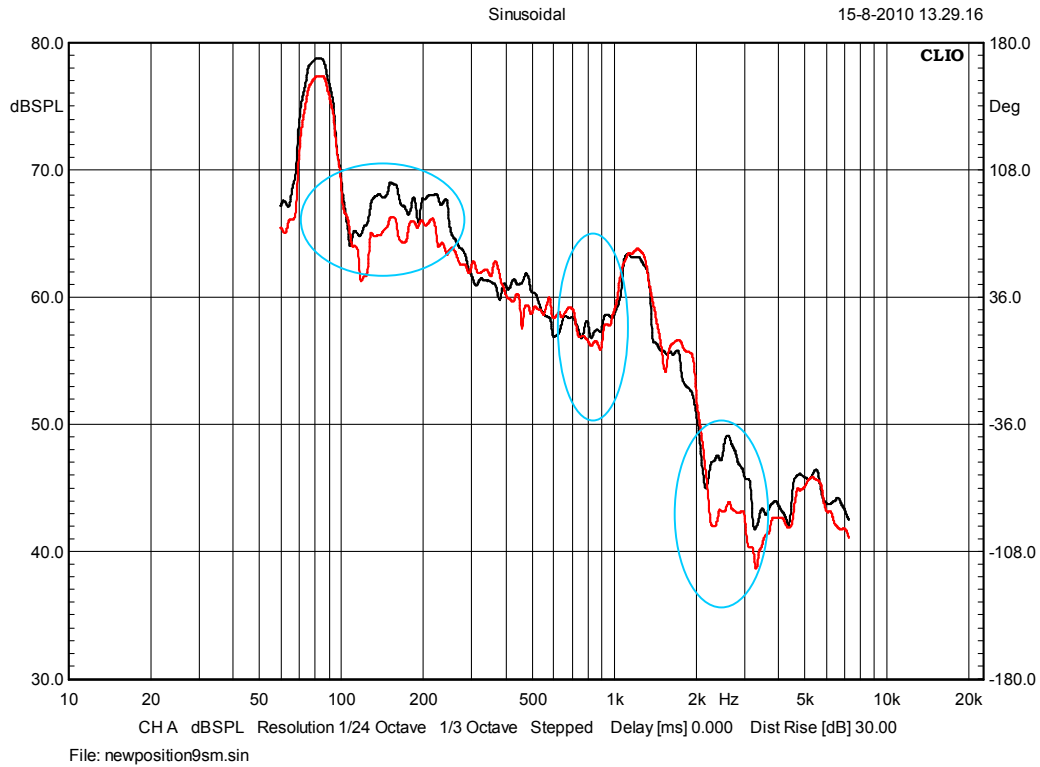
## Figure 6. 2<sup>nd</sup> Harmonics Analysis. ( +30dB Rise )



*The red line indicates there is no SMD involved while the black line indicates 3 SMD involved. The blue circles indicate there is big different harmonics in the setting with and without SMD.*

# Technical Note

## Figure 7. 3rd Harmonics Analysis. ( +30dB Rise )

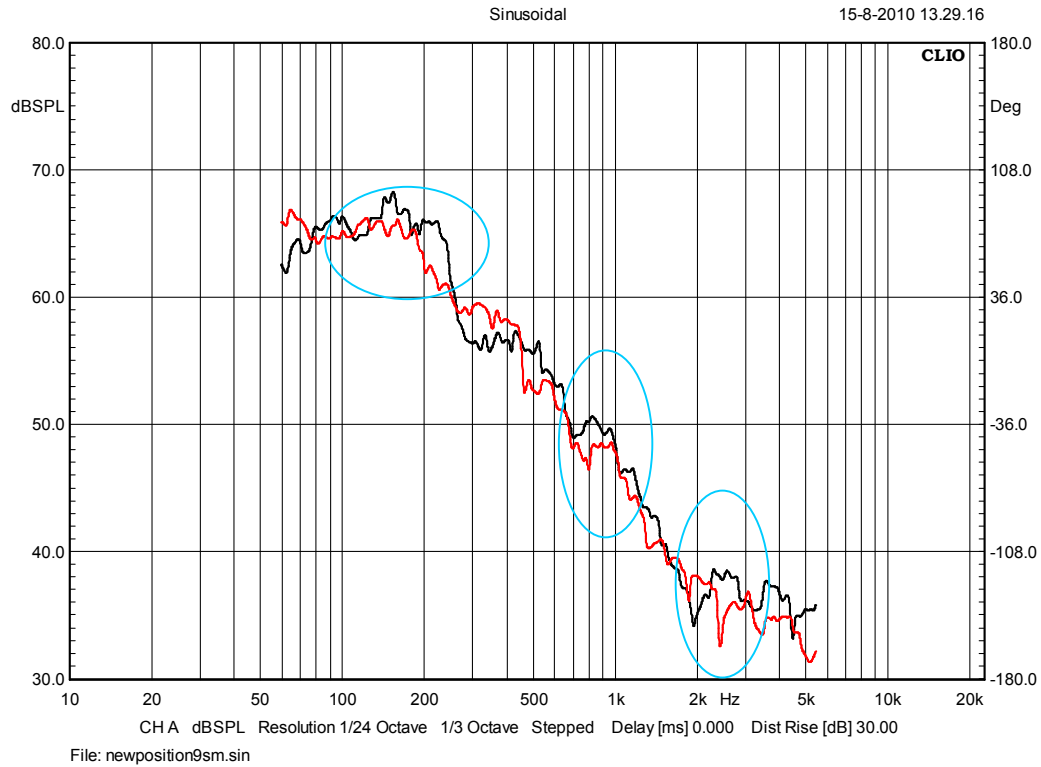


*The red line indicates there is no SMD involved while the black line indicates 3 SMD involved. The blue circles indicate there is big different harmonics in the setting with and without SMD.*



# Technical Note

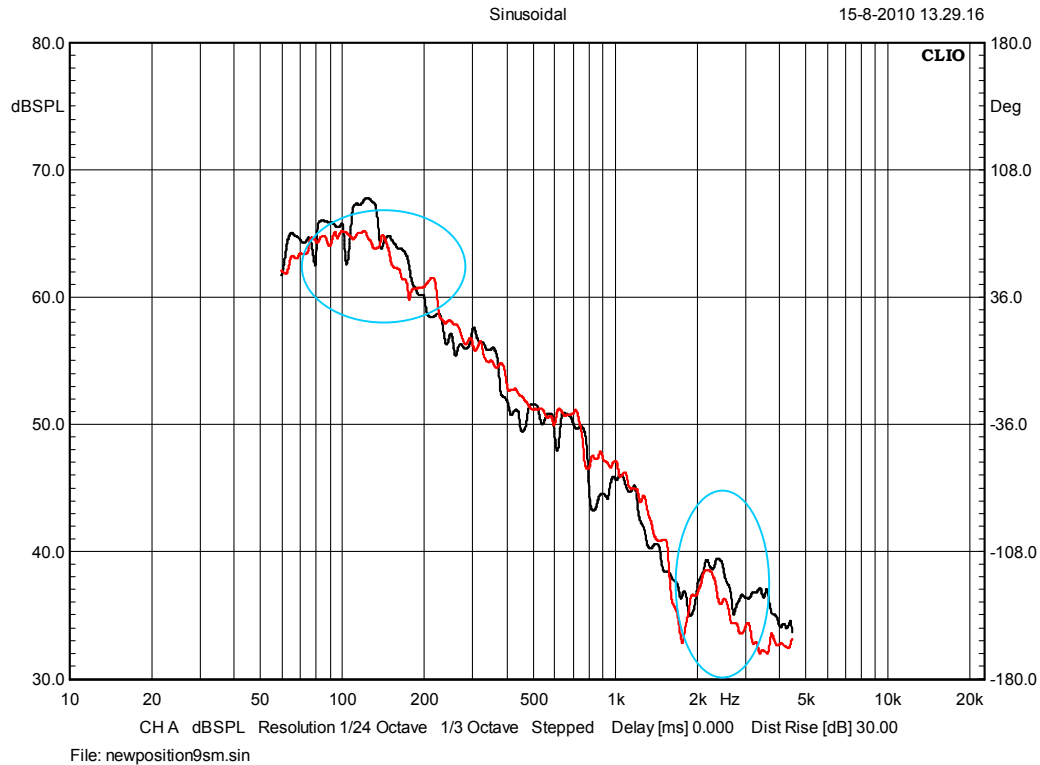
## Figure 8. 4th Harmonics Analysis. ( +30dB Rise )



*The red line indicates there is no SMD involved while the black line indicates 3 SMD involved. The blue circles indicate there is big different harmonics in the setting with and without SMD.*

# Technical Note

**Figure 9. 5th Harmonics Analysis. ( +30dB Rise )**



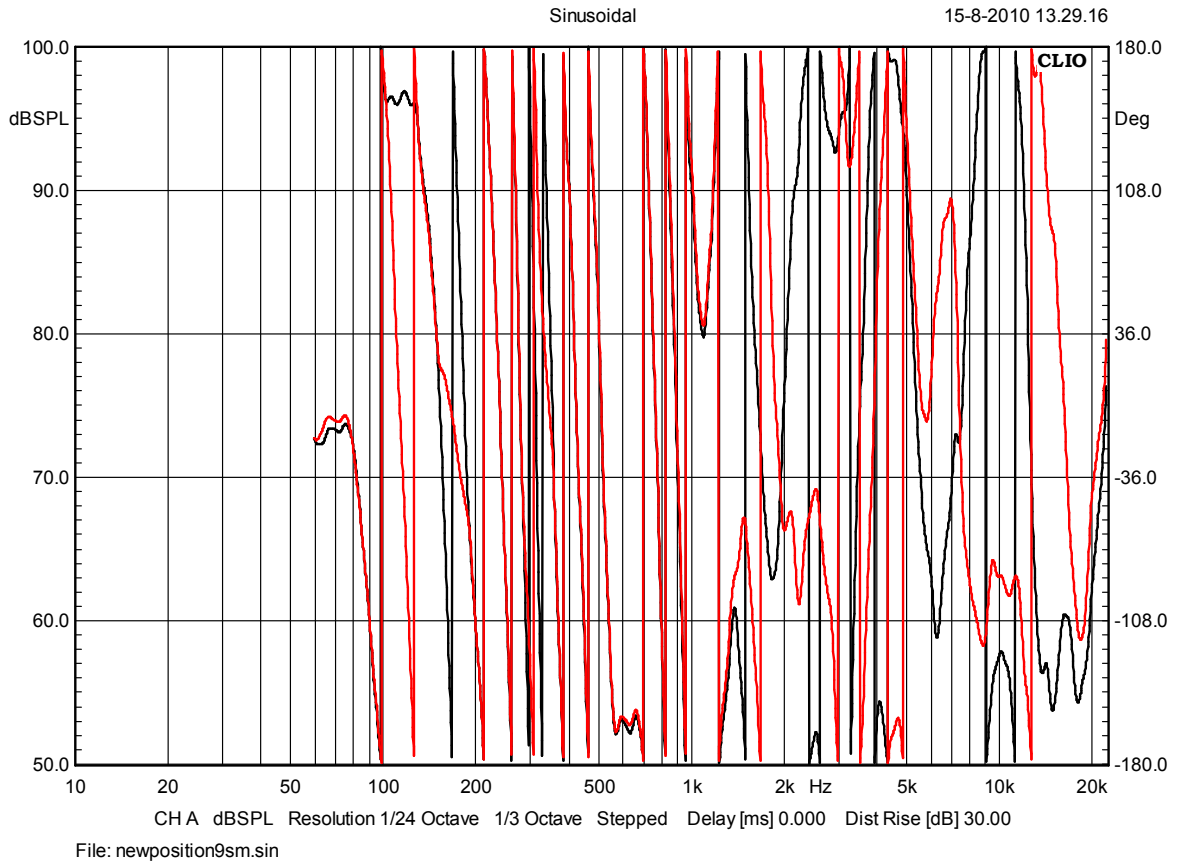
*The red line indicates there is no SMD involved while the black line indicates 3 SMD involved. The blue circles indicate there is big different harmonics in the setting with and without SMD.*

## Conclusion:

From the 2<sup>nd</sup> to 5<sup>th</sup> Harmonics Analysis (Fig. 5 to Fig. 9) shows the black line curve level is than that of the red line curves in 3 regions which are from 80Hz to 200 Hz, from 800Hz to 1kHz and from 2kHz to 3.5kHz. This implies that SMD can make a higher output level. Thus, SMD reradiate more harmonics and enrich the sound to become richness, fully body and comfort.

# Technical Note

## Figure 10. Phase difference



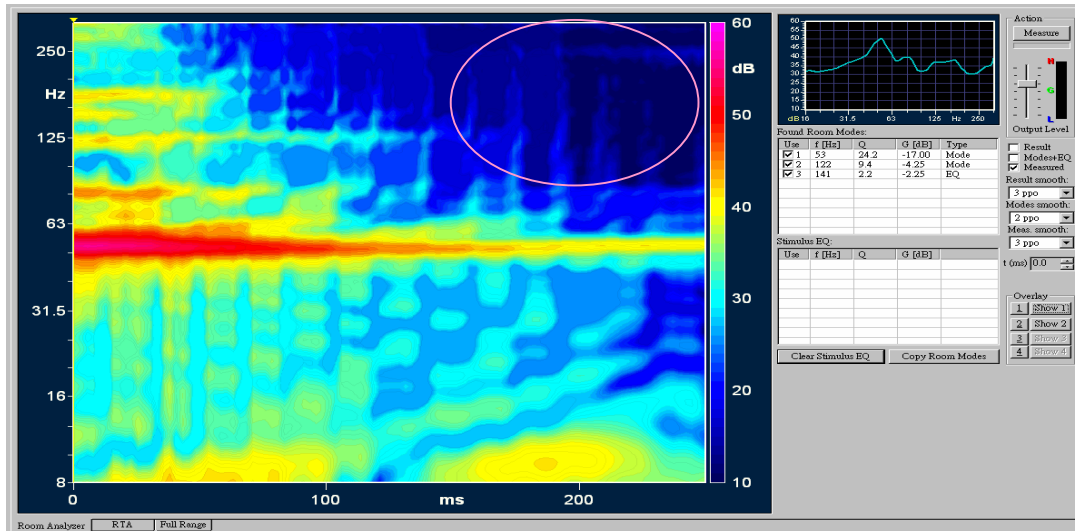
*Red line in indicates there is no SMD in the setting while black line indicates there are SMD involved.*

### Conclusion :

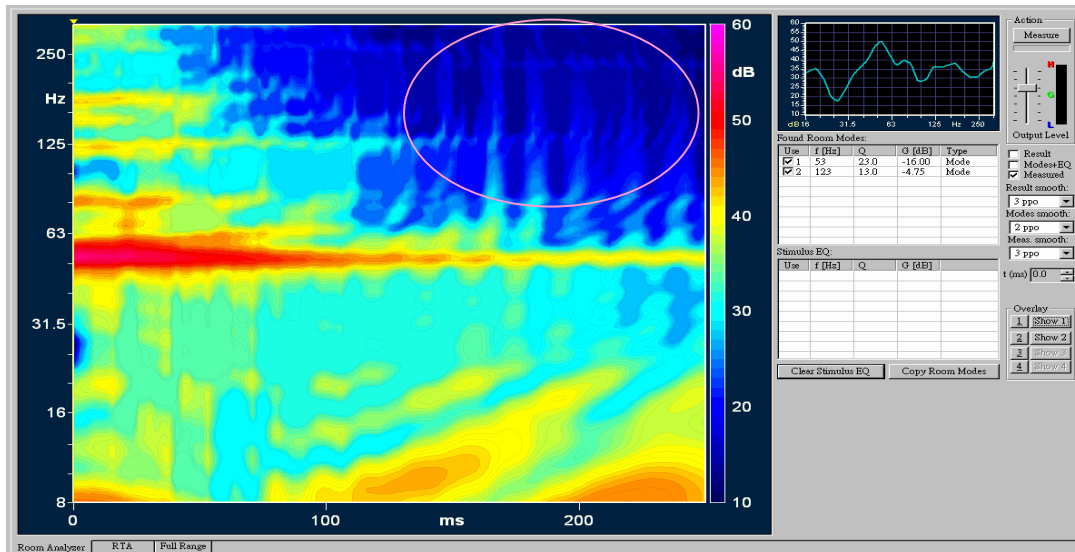
There is less phase change on the black line so this can be concluded that more coherence would be resulted after applying SMD in the audio band.

# Technical Note

## Figure 11. 2D Water Fall Measurement (No SMD Placement)



## Figure 12. 2D Water Fall Measurement (With SMD Placement)



The reverberations in Fig.11 appear less than that in Fig.12.

### Conclusion:

Reverberations in Figure 12 more evenly and frequently appeared. This implies that 80Hz to 300Hz, SMDs are excited to provide ~5dB @ 120ms to 250ms. This makes the room's acoustic lively and longer reverberations.

## Technical Note

### **Summary:**

Not only do the measurements show the differences between with and without SMD placement, but also the listening tests. The audible differences were obviously observed. With the SMD involvement, spacious and lively sound is generated. SMD can diffuse sound and reflect the sound in a variety of directions. This allows a listener to perceive sounds from every part of the room, making it seem lively and full. Shun Mook also have other products for enhancing room performance.

### **Remark:**

“Sympathetic Resonance”. As all elements in this universe will resonate when like pattern energy is generated from another material. Just as in a physics experiment when you excite a metal tuning fork of say the "A" frequency and hold it close to another static "A" tuning fork. The result is that the second tuning fork will also get excited because same frequency energy is transferred through the air to cause the vibration. Thus when the musical energy produced by any Hi Fi system will excite to different degree of all materials within the space covered by the acoustic spectrum. Different materials will have a positive or negative effect on each other influencing the final music production. The secret is to control and tame such resonance to the advantage of the system.

It is commonly known that many musical instruments uses Mpingo and other ebony wood to create the most natural musical tones and harmonics. Just like the clarinet, the violin and other wind and string instruments uses the ebony as the essential component to generate the sound. “

# Technical Note

## **Reference:**

High Performance Loudspeakers Third Edition - Martin Colloms

[CLIO application: Room and Building Acoustics -  
http://www.audiomatica.com/techresources.htm](http://www.audiomatica.com/techresources.htm)

<http://www.shunmook.com/text1.htm>