Anti-Mode 8033Cinema
User's Manual

Revision History				

Rev.	Date	Author	Affected chapters	Description
1.0	2007-11-30	TK & ToLi	All	Original version Finnish and English for 8033B
1.8	2012-02-15	POj	All	Updated for Anti-Mode 8033Cinema and 8033S-II
1.9	2012-03-18	POj	All	Typo and language corrections

Recycling information

The product you have purchased is marked according to the **Waste Electrical and Electronic Equipment Directive** (WEEE Directive). There are take-back systems in place that help to preserve nature and natural resources when products are disposed of appropriately. If you need to dispose of this product, use the take-back system that has dedicated collection facilities for electronic equipment. Do not put the product into household waste disposal!

Also, the product has been manufactured using parts and processes that follow the directive of the Restriction of the use of certain Hazardous Substances in Electrical and Electronic Equipment (RoHS).

Intended Use

The Anti-Mode 8033s have been designed for normal indoor use and be connected to other equipment with cables not exceeding 3m (10 feet) in length. If you use cables of extended length, check that their quality is sufficient and observe electrostatic discharge precautions when connecting or disconnecting them. Use of the device outdoors, in humid or other extreme environments, may cause reduced performance or risks to the user of the equipment.

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1. Connections and Buttons

Figure 1: ANTI-MODE 8033 Front panel

1.1. Front panel:

1. Microphone input jack.
2. LIFT Button: LIFT25 / LIFT35 / FLAT selector.
   * Short press: Selects low frequency boost mode.
   * Long press (with bypass off): Stores current settings.
   * Long press (with bypass on): Enter filter selection mode (Anti-Mode 8033S-II).
3. BYPASS Button: BYPASS selector.
   * Short press: Toggle Bypass mode (disable / enable processing)
   * Long press: Begin secondary calibration for Wide Area Correction.
   Long press of both LIFT and BYPASS buttons: Begin main calibration.
4. PWR LED: Lit when the device is on.
   * flashes in filter edit mode, other LEDs show selected filter (Anti-Mode 8033S-II).
5. BYPASS LED: Lit when the Anti-Mode correction and lifts are bypassed.
   * flickers for 3dB input level warning (if flickers constantly, please reduce input level)
6. LIFT25 LED: Lit when the 15-25Hz lifting EQ (equalization) and subsonic filter is on.
   * is dimly lit along with the LIFT35 LED when the subsonic filter is active without lift.
   * flashes during calibration.
   * flickers for output saturation warning (please reduce input level).
7. LIFT35 LED: Lit when the 25-35Hz lifting EQ and subsonic filter is on.
   * is dimly lit along with the LIFT25 LED when the subsonic filter is active without lift.
   * flickers for input overdrive warning (please reduce input level).

1.2. Back Panel

Figure 2: ANTI-MODE 8033Cinema rear panel

1. 9 VAC / 12 VDC connector: Input power.
2. LINE OUT / RCA connector: To subwoofer
3. LINE IN / RCA connector: LFE (Low-Frequency-Effects) or SUB (subwoofer) signal from the pre-amplifier or AVR (Audio/Video Receiver).

2. Quick Setup Guide

1. Please read the rest of the manual to get the most out of your system and the Anti-Mode 8033.
2. Connect the subwoofer signal to "LINE IN"
3. Connect the active subwoofer to "LINE OUT" output.
4. Connect the microphone plug to the "MIC" jack and place and fix the microphone as close to the listening position (head of the listener) as possible. Use of a microphone stand helps with correct microphone placement.
5. Connect the power supply to the "9 VAC / 12 VDC" connector and wall socket.
6. The Anti-Mode 8033 will turn on automatically when you plug it in.
   Note: All LEDs on the front panel are lit if the device has never been calibrated.
7. Switch on the subwoofer and moderately reduce its volume setting.
8. Press and hold both LIFT and BYPASS buttons for three seconds to start the first (main) calibration process. Release the buttons when the LIFT25 LED starts flashing. If you keep holding the calibrate buttons down the calibration process will be aborted.
9. The Anti-Mode will generate at least four frequency sweeps for successful calibration. When the LIFT25 LED stops flashing the calibration process is completed.
10. For best results, after the Anti-Mode calibration has finished run your AVR's calibration program to set speaker levels and distances.
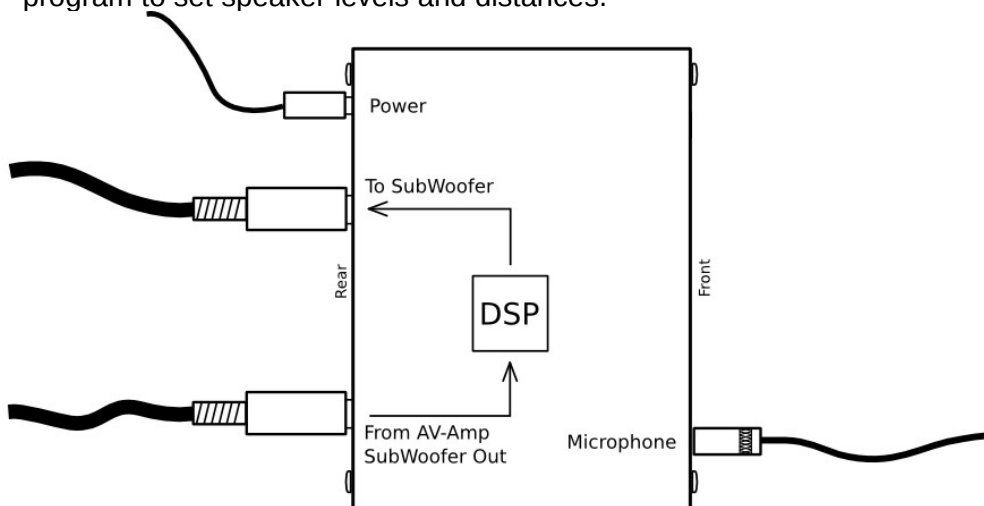

Figure 4: Setting up the ANTI-MODE 8033

2.1. Before Calibration

If you have a small reflex subwoofer, decrease its volume before calibration. If the subwoofer has a built-in low-pass or other type of filter, it should be deactivated before the calibration process and re-activated after calibration. Cross-over and low-pass filters in the AVR do not affect calibration since they take place before the Anti-Mode 8033 in the signal chain. Also, any other audio equipment connected before the Anti-Mode 8033 will not interfere with the calibration process.

Pay close attention to the vertical positioning (height) of the calibration microphone since proper room mode correction may be affected. The microphone is omnidirectional, so its precise orientation doesn't matter. If you use your subwoofer with doors closed, keep them closed during calibration. If you want the room correction to affect a wider area, the first calibration point should be selected near the center of the listening area (or the primary listening position). More about Wider Area Correction in section 3.

2.2. Calibration

Press both the LIFT and BYPASS buttons on the front panel and hold them down to start the calibration process. Make sure that both of the buttons are pressed down at the same time. After a couple of seconds the LIFT25 LED starts flashing and calibration begins. Now release the buttons and wait for the automatic calibration to finish. The measurement program analyzes the room utilizing four to six frequency sweeps.

The calibration starts with a moderate output volume. The measurement routine allows wide range of input levels. The input level warning LED (BYPASS LED) starts to flicker if less than 3.0 dB of headroom is left during measurement. If this persists, the generated output level is adjusted down. If the microphone is near overflow, the sweep is also restarted.

The calibration process is very robust and it tolerates background noise very well, therefore speech and small noises do not affect the process. However, one should avoid making loud noises, especially near the microphone. For example, tapping the microphone or its cable can overflow the microphone input, causing the calibration process to restart.

Tip: Tapping the microphone with a finger is an easy way to test the microphone, you will see the BYPASS LED flicker. A harder tap will drop the level or restart the calibration process.

If you initiate the calibration process by mistake, you can abort it by pressing either the LIFT or BYPASS buttons. This will restore your saved settings, including the lift settings. Calibration is automatically aborted after one sweep if the microphone is not connected properly, is faulty, or the calibration signal is not detected (for example, the subwoofer is not turned on). The previously saved settings are restored in this case.

2.3. After Calibration

Once the last sweep is over, the calibration process is finished. The subsonic filter is automatically activated. The results are stored in the non-volatile memory inside the unit so they are not lost if the Anti-Mode loses power. The Anti-Mode 8033 is now fully functional and the microphone can be detached, unless the user wishes to perform Wider Area Calibration.

After calibration the subwoofer may sound more quiet. This is partly because the overall sound level has dropped when the room resonances have been suppressed, and in part, it just sounds more quiet, because you have been used to peaks in the audio output. It may take a while to get accustomed to the new sound but you quickly start to notice sounds on frequencies that were drowned out by the untreated peaks. The calibration process raises the overall level, so the subwoofer volume needs to be increased only slightly (1-6 dB). For best results perform this adjustment using the AVR's subwoofer volume control.

If the AVR supports speaker distances, you can add 90 cm (~36 inches) to the subwoofer distance relative to other speakers to compensate for the internal processing delay. This is not absolutely necessary since the delay is small enough that the human auditory system generally cannot detect it.

You can also use your AVR's automatic calibration functions to determine the correct distance and level settings. In this case, the processing latency of the Anti-Mode and the new subwoofer level is automatically taken into account by the AVR and you do not need to adjust them yourself. Use the AVR's "small" speaker setting best results. First calibrate the Anti-Mode, then perform the AVR calibration so it sees the corrected response.

Whenever the placement of the subwoofer or listening position changes, the initial calibration should be performed again to insure an optimal result.

Important! If only one sweep signal was generated during the calibration, one of the following situations occurred: the microphone was not properly connected, the calibration signal was not detected, or the calibration was aborted. If only two sweeps were generated, perhaps both buttons on the front panel were not pressed. In any case, the calibration process must be restarted.

2.4. Subwoofer Placement

There are several opinions available on how to determine the best place for your subwoofer. Due to room reflections creating resonances, some frequencies are amplified (room modes / peaks) and some are attenuated (nulls / dips). Without a sub EQ device, you need to locate the subwoofer in a place that creates the flattest possible response in your room.

This is not what you want with the Anti-Mode. With the Anti-Mode you do not need to be concerned about room modes because they are easily and effectively corrected. Instead, you should concentrate on minimizing the number of nulls, because these cannot be corrected by a sub EQ device.

If you are not happy with your subwoofer performance in its current location, try locating the subwoofer in a corner. This causes the room modes to be excited maximally, but reduces the occurrence of nulls. The boundary reinforcement from the corner walls also allows the sub to reproduce lower frequencies without using extra power. Run the Anti-Mode calibration after relocating the subwoofer.

Therefore, what was once considered the worst place to locate a sub is now the best place when using the Anti-Mode!

2.5. Cross-Over Frequency

The appropriate cross-over frequency to use depends on the capabilities of the subwoofer and main speakers. For best results, the main speakers should be set to 'small' in the AVR so only the subwoofer that has its response corrected is reproducing the low frequencies.

With the Anti-Mode the subwoofer integration through the AVR should be more effortless. You are now able to use a higher cross-over frequency than the standard 80Hz setting without the sub becoming localizable. We recommend trying 100Hz or 120Hz cross-over setting but because there are varying differences between individuals, let your ears decide which setting is best for you.

2.6. Multiple Subwoofers

Having multiple subwoofers reproducing the same signal (dual mono) will result in a smoother response. The Anti-Mode can be used with any system allowing you to use corner placement of your subs. Connect the Anti-Mode to the signal going into each sub, and calibrate them together. When calibrated together, the nulls created by one sub are filled in by the other sub. The Anti-Mode takes this into account, creating a smoother overall response than if the subs were calibrated separately.

If you want to reproduce low frequencies in stereo, you need either two Anti-Mode 8033's or one Anti-Mode 2.0 Dual Core. Stereo at low frequencies is generally not needed, because low frequencies are omnidirectional and directional cues are determined from harmonics and other aural information. It is usually better to use the dual mono arrangement instead of stereo to get a more even response.

3. Wider Area Correction

In some situations it is more favorable to compensate for room acoustics in a wider listening area. When this is done, the result is no longer optimal in any single listening position but is improved for a wider listening area. Before performing wider area correction the first (main) calibration procedure described in the earlier section must be performed. As previously discussed, the first calibration is done with the microphone at the center of the listening area or primary listening position within the area.

The Anti-Mode 8033 can be calibrated for wider areas by moving the microphone to another point within the listening area. Pressing and holding the BYPASS button will initiate a secondary calibration utilizing two to three additional frequency sweeps. The Anti-Mode 8033 will use the results from these sweeps in conjunction with data gathered from the first calibration to create a compensation model for a wider listening area.

Do not accidentally keep both the LIFT and BYPASS buttons pressed on the front panel as this will start the first (main) calibration all over again overriding the current room data.

Secondary calibrations can be done multiple times and will not result is the loss of data from the first (main) calibration. The previous secondary calibrations will not be retained. It is easy to try different secondary calibration points for the best audible result. Following are several strategies for choosing the microphone position for the secondary calibration.

3.1. Strategy 1, "Compensation of the worst response point"

When the first (main) calibration is performed at the primary listening position or at the center of the listening area, you can then evaluate the result by listening at different positions around the room.

If the result is not adequate at some location, that location can be used as a secondary calibration point. Also any location between the secondary point and the first point can lead to good results. Inevitably, the result will get less optimal at the first point, but is usually improved everywhere else, including the worst response point.

3.2. Strategy 2, "Gradient compensation"

If it is difficult to find the worst response point in the listening area, Gradient compensation is a good approach. Find the secondary calibration point by moving the microphone from the first calibration point toward the closest corner of the listening room by 40-90 cm (16 to 36 inches) and downwards (towards the floor) approximately 10-20 cm (4 to 8 inches).

Perform the secondary calibration with the microphone in this position. If the first calibration point was closer than a meter (39 inches) from the wall, the microphone should be moved only about 20-40 cm (8 to 16 inches) towards that wall for the secondary calibration.

The Gradient compensation method works well in removing the resonances arising from reflections between opposing walls or floor/ceiling (axial modes) for larger areas in a rectangular room.

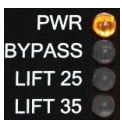# 4. Basic operation

4.1. Bypass mode

If you want to compare the corrected and uncorrected operation, press the BYPASS button quickly. This will switch between bypass and normal mode. The first press will put the Anti-Mode into bypass mode, which is also indicated by the BYPASS LED being lit. If the Bypass mode is already active, the unit switches back to normal mode. In bypass mode no room corrections are active and user selected lifting EQ is turned off.
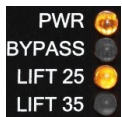
4.2. Lifting EQ

The LIFT button switches between the EQ settings of the Anti-Mode 8033. The settings are stored with a longer press of the LIFT button. A brief sound heard from the subwoofer after settings have been stored indicates that you should release the LIFT button.
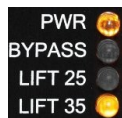
4.2.1. Flat

The first EQ setting is "flat" or no lifting. Neither the LIFT25 nor LIFT35 LED are lit. In this setting, the target response is flat from 5Hz to 160Hz. This setting is automatically changed to Subsonic-Filter-Only after the first (main) calibration. You can override this and save the new setting.
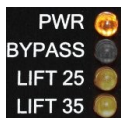
4.2.2. Lifting 15-25Hz

The second EQ setting is LIFT25. When the LIFT25 LED is lit, the Anti-Mode boosts frequencies between 15 and 25Hz (max. 8dB at 20Hz). This will also activate a digital infrasonic filter, which will filter out frequencies below 10Hz, which can be dangerous to ported subs without proper protection.

4.2.3. Lifting 25-35Hz

The third EQ setting is LIFT35. When LIFT35 LED is lit, the Anti-Mode boosts frequencies between 25-35Hz (max. 8dB at 30Hz). As with LIFT25, the digital infrasonic filter is also activated.

4.2.4. Subsonic Filter Only

A fourth EQ setting activates the digital subsonic filter without any lift. The Subsonic-Filter-Only mode is active when the LIFT25 and LIFT35 LEDs are dimly lit. The "flat" setting is automatically changed to this setting after the first (main) calibration.

All lifting modes decrease the overall level of the signal by 3 dB to reduce the risk of clipping / saturating the output signal. Listening tells you which one of the lifting settings gives best results. The 'flat' and 'subsonic-filter-only' settings are probably the best options for music, because they give the most accurate transient response.

4.3. Input Level Warning

If the input signal level in the Anti-Mode 8033's Analog to Digital Converter (ADC) is near the maximum input range, the user is warned in two phases. If the input signal level has only 3 dB of headroom remaining, the BYPASS LED will start flickering. If the level increases from this, the signal starts to saturate at the ADC input and harmonic distortion increases. If the input level reaches maximum, the LIFT35 LED starts flashing. When the input level is reduced the LEDs resume normal operation.

The input level warning is useful in optimizing the signal level that goes into the Anti-Mode. If the volume of your subwoofer is too high, the AVR's calibration may set unnecessarily low levels for the subwoofer output. This leaves much of the Anti-Mode's available input range unused and can cause an audible low level hum or noise from the subwoofer. This may be the case if your AVR indicates its subwoofer output level is below -3dB.

To take advantage of the full input range of the Anti-Mode, decrease the subwoofer volume and increase the output level from the pre-amplifier or AVR until you see only occasional 3dB warnings, then lower the volume a few dB.

The level warning is also active during calibration. During calibration the output level is decreased automatically if needed (microphone is saturated). The LIFT25 LED flashes to indicate the progress of calibration.

4.4. Output Level Warning

The new Anti-Mode correction will raise the overall level of the output depending on how drastic corrections were applied. This increase and an active lift mode can increase the output level in some frequencies so much that the signal gets saturated in the output. In this case the LIFT25 LED starts to flicker, and you should decrease the Anti-Mode 8033 input level or turn off lift mode.
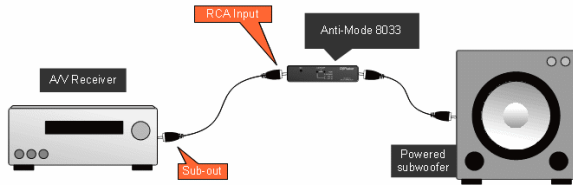
4.5. Powering Up and Down

The Anti-Mode 8033Cinema has almost no power-on and power-off transients, so you can easily power it on and off using a switchable power cord or the switchable power output from your AVR.

The Anti-Mode also fades in when the signal starts, so it can be powered on without transients even while the audio signal is already applied to the input connector(s).

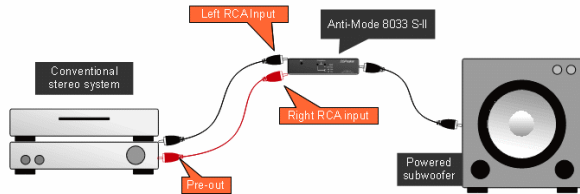Because the Anti-Mode consumes very little power, you may choose to leave it powered on.

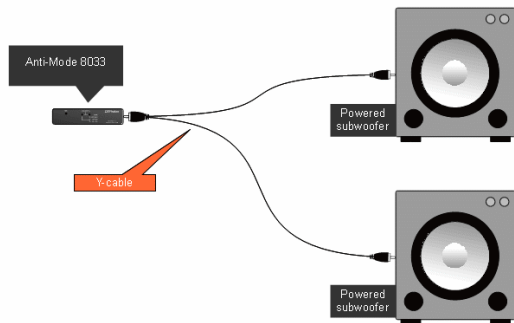# 5. Connection Examples

Basic Home Cinema Setup

In a basic home cinema configuration the Anti-Mode 8033Cinema is connected between the AVR / pre-amplifier and the subwoofer using line-level connections.

2.1 Stereo Setup with Subwoofer, No Sub-out In Receiver

The Anti-Mode 8033Cinema can be used when connecting into a 2.1 stereo system which has only stereo pre-outs available (no dedicated LFE or sub output), but it requires an additional stereo to mono converter cable.
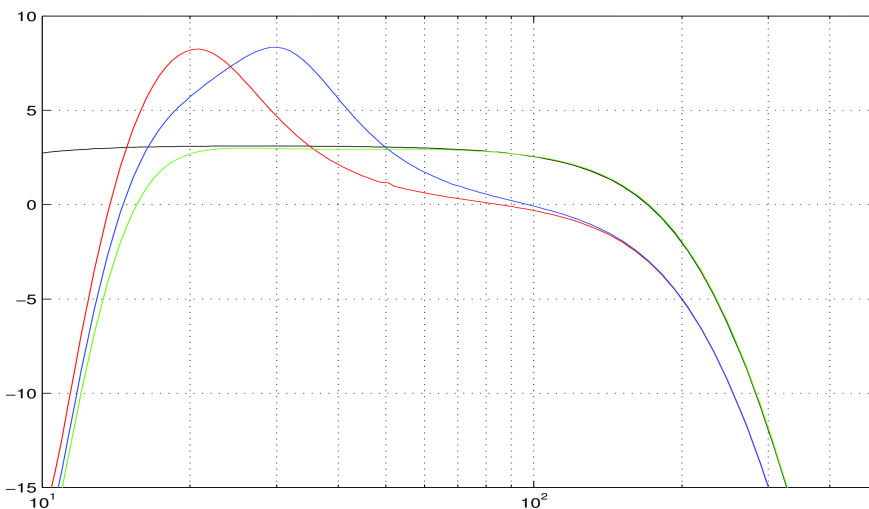
Two Subwoofers (Dual Mono)

Two or more subwoofers can be connected using a splitter Y-cable.

See more connection examples from www.dspeaker.com .

6. Frequency Responses

(from left to right)
Black: Bypass
Red: Lift 15-25
Blue: Lift 25-35
Green: Subsonic

7. Technical Specifications

Electrical characteristics:

Power consumption:	1.2 W
Input sensitivity:	Line level (1.0Vrms nominal, 1.75Vrms max)
Amplification:	3.0 dB (bypass)
Operation voltage:	9 VAC or 12 VDC
Low-pass (analog):	Bessel 12 dB/octave, Q ~ 0.5, fc = 250 Hz
Frequency range (-3 dB):	5 – 160 Hz
Dynamic ratio (unweighted):	> 90 dB

Firmware features:

Frequency resolution:	< 0.5 Hz
Maximum attenuation:	96 dB
Filter Q-value range:	Unlimited (32-bit integer space)
Sub-sonic filter:	10 Hz (user-selectable)
Computation accuracy:	32 / 40-bit integer
Latency:	2.7 ms
Anti-Mode-Filters:	28
Correction range:	16 – 160 Hz
Lift filters:	20Hz, 30Hz

8. Manufacturer

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