

## Automated tuning system for rapid equalisation of the spectral response of consumer devices

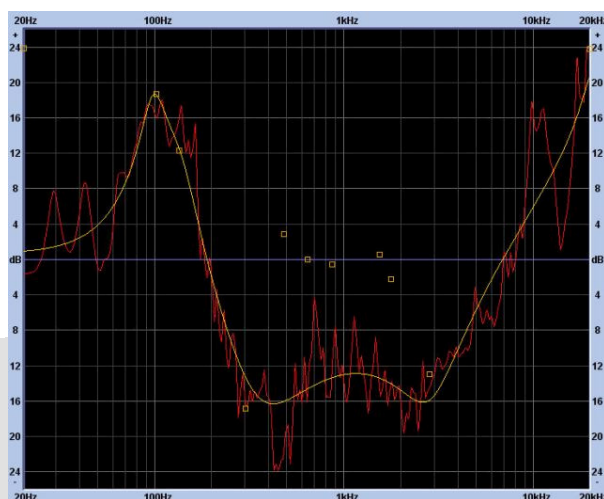
### Overview

The **MajEq** system is an automated tuning system that radically speeds up the process of equalising the spectral response of consumer devices to remove cabinet and driver resonances and thereby improve the sonic performance of the device. Hours using conventional parametric EQs for response equalisation can be reduced to minutes.

### Features

- Measurement system to capture the frequency response of CE devices including speakers and headphones
- Import of measurements (as an alternative) from external systems (e.g. SMAART<sup>®</sup>, SysTune<sup>™</sup>)
- Automatic correction to 'target' EQ curve within a few seconds with guaranteed convergence
- Selection of the useful band where correction is applied (so as not to over-drive speakers outside their useful range and avoid nasty noises and damage)
- Specification of a fixed DSP budget (e.g. 5 bi-quads) for correction
- Correction can be accomplished via regular parametric EQs or via OptEQ which provides a more efficient use of the DSP budget with up to 40% fewer bi-quads for the same error as a parametric
- Direct manual fine-tuning of compensating results produced by parametric EQs
- Editing of the correcting response via familiar EQ controls (filters, parametric EQs) if it is desired to over-ride the auto-correction produced by OptEQ – all within the same defined DSP budget

- Layering additional EQ effects (e.g. Classical, Pop, Jazz, Rock curves &/or regional sounds) – all within the same defined DSP budget
- It allows deskilling of the task as relatively unskilled people can produce good results
- It's a low latency, low processing budget solution



Red line: target curve required to correct the speaker; Yellow line: Correcting response using 4 bi-quads

### Applications

**MajEq** can be used stand-alone or integrated into the **FixFx** tuning tool to provide a complete solution for both automated frequency response equalisation of Enclosure/Driver and for adding corrective effects (e.g. Bass Enhancement), assistive effects (e.g. Dynamic Range Control for increased intelligibility in noisy environments) and aesthetic audio effects (e.g. Stereo Widening)

Aspects of the **MajEq** system are covered by UK Patent Application Publication No: GB 2 458 631 A, International Patent Application Publication No: WO2009/112825 and UK Patent Application No: 0922702.6 .