MajEq Introduction

Pro and Commercial Audio

1. MajEq Overview

MajEq is an automated frequency response curve matching application (see product brief) that can be used with parametric EQs (**Bell**s) to do "curve matching" to a required target frequency response much faster than a "Golden Eared" expert can use manual adjustment. However, it still offers the fineness of control to the expert via an intuitive drag and drop interface so it can easily be fine-tuned manually if required.

The application includes a frequency response measurement system (or alternatively measurements can be imported) to develop the target curve.

The target curve may include measurement artifacts, so curve smoothing is also included in order to develop a robust, smooth target curve.

Finally, the target curve can be "windowed" at both low and high frequencies to determine the frequency range over which the curve matching takes place.

A processing budget (i.e. a fixed number of EQs) is selected and the application will produce the response with least mean squared error from the target curve for that DSP budget.

It can also be used in **OptEQ** mode (5 variable non-parametric EQ Mode with asymmetric EQ shapes) to optimise DSP resources where efficiencies typically of up to 25% can be made in the required processing budget for the same curve error.

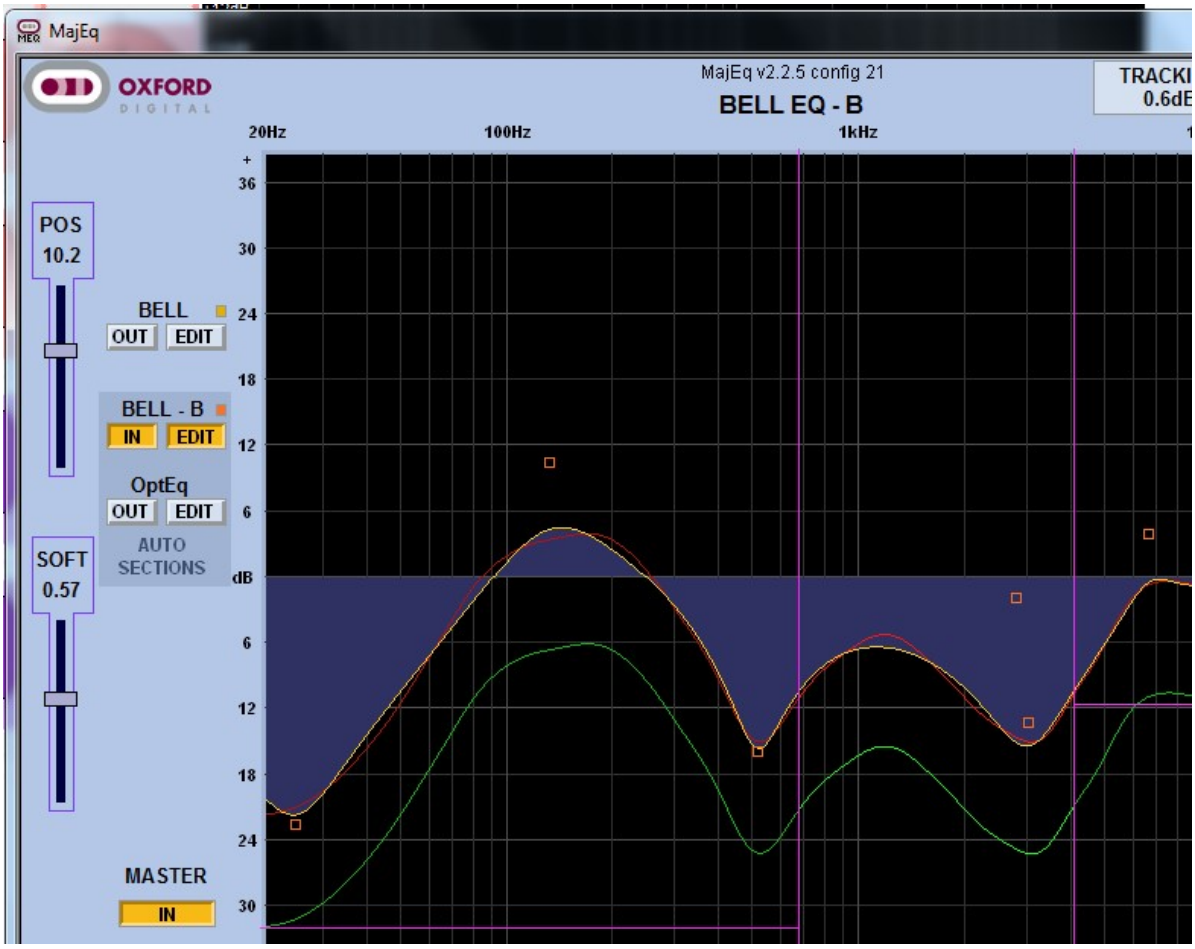
This is the key part of the package that Oxford Digital licensed to Harman. Please see associated press release and for more details the PSNE article.

MajEq can be applied in two modes: Static mode and Continuous Mode.

1.1 Static Mode

A good example of Static Mode is the use of MajEq to speaker correction where it is required to match a curve which is the inverse of the measured response of the loudspeaker over some frequency range in order to flatten the response.

It also has measurement smoothing, frequency range windowing, editing & other functions:



Red: Target curve

Yellow: Automated correction with 6 Bell EQs

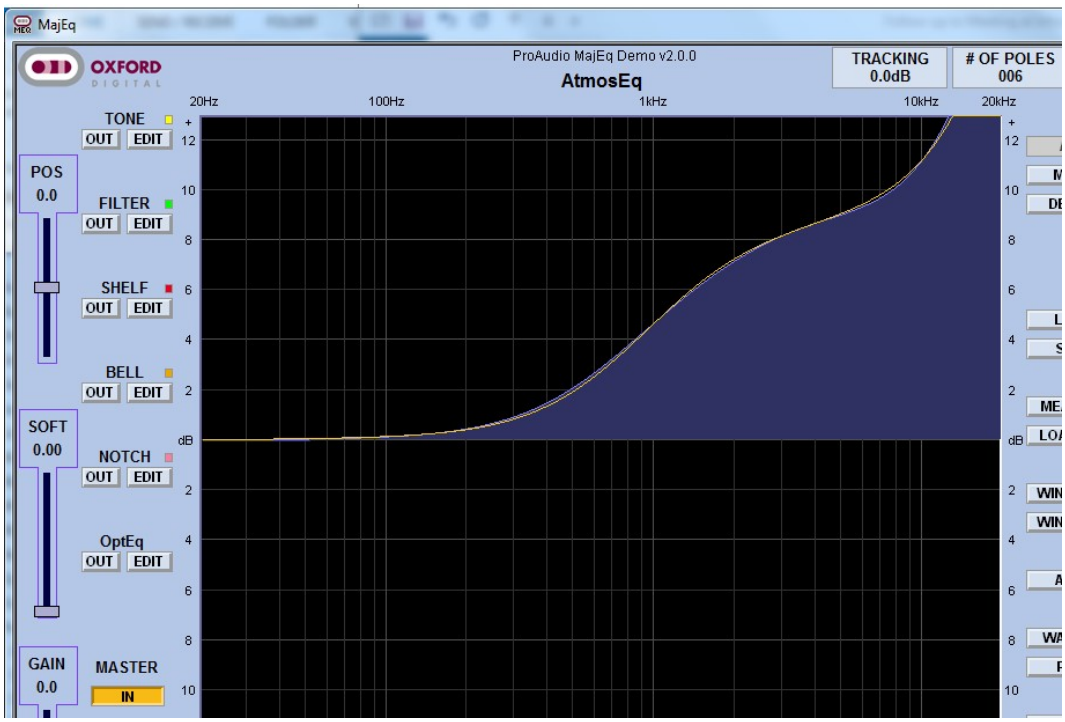
1.2 Continuous Mode

This is where the algorithm runs continuously and makes continuous adjustments to a curve that's moving, for example by a hand moving a control or data coming in from sensors.

The Oxford Digital Atmospheric EQ correction (**Atmos EQ**) uses this technology to correct for high frequency air absorption effects where a complex expression involving the:

- Distance of the listener from the loudspeaker
- Relative Humidity
- Ambient temperature
- Barometric pressure

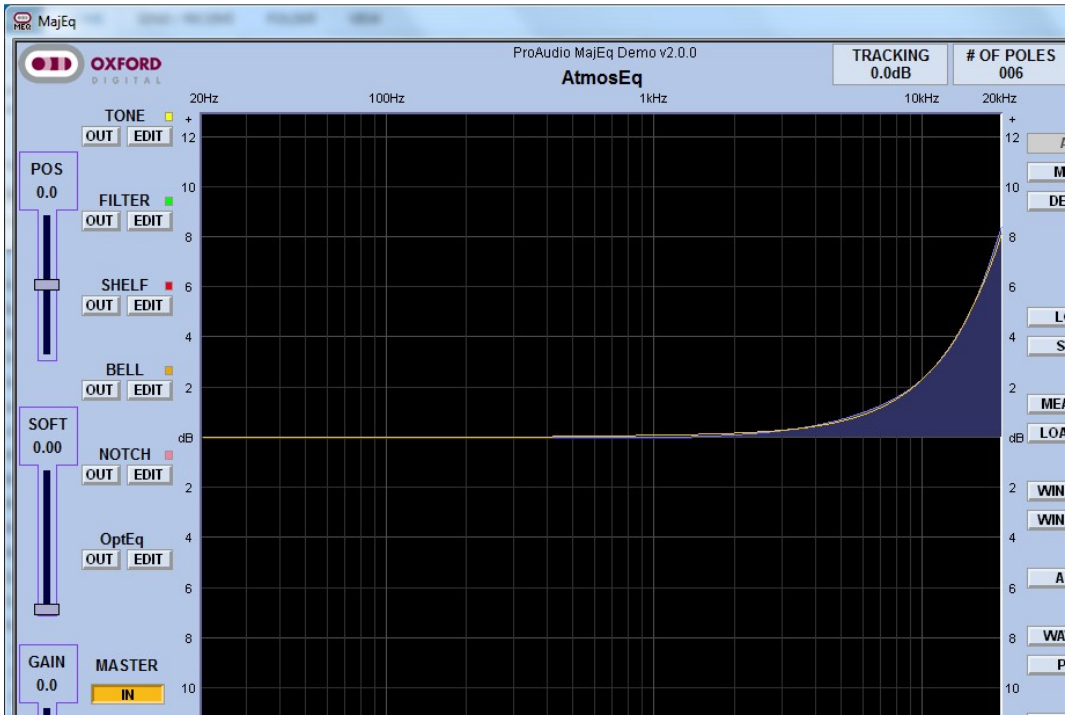
Is used to calculate the required correcting EQ to be applied to the loudspeaker:



Yellow: Required response calculated from complex expression involving relative humidity, barometric pressure, temperature and distance from the loudspeaker

Blue: Actual response from 3 Bell EQ sections

As the controls for Relative Humidity & Distance are changed, the response changes seamlessly:



Normally ***MajEq*** runs on a PC and sends coefficients over a control link, however there is no huge processor requirement.

For embedded applications any floating-point processor with C compiler should be suitable.

3. Evaluations

Evaluations of both ***MajEq*** and ***MajE-Fx*** are available after execution of a Non-Disclosure Agreement.

Please don't hesitate to get in touch if you have any questions:

4. Contact Information

For further information please contact:

N: John Richards

T: +44-1993-891-868 (direct)

+44-845-450-5664 (general)

E: john.richards@oxford-digital.com