Oxford Digital EQ Introduction

Pro and Commercial Audio

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1 Concept

The Oxford Digital EQ is targeted at medium to high end pro-audio and commercial systems where:

- There is a medium to high EQ DSP budget available
- The operator is skilled and expects to be in control of operations

It provides comprehensive EQ facilities including two, patent-protected EQs:

- ***SmoothEQ***
  An EQ that allows arbitrary specification of frequency response from either GUI or automatic input of frequency and gain at arbitrary points (e.g. processed input from acoustic measurement system)
- ***New Graphic EQ***
  based on a constrained set of SmoothEQ frequency points

2 Application Areas and Unique Selling Points (USPs)

Include:

- Live Sound / Touring Sound / Installed Sound & Venue Correction
- Room Correction (e.g. Home Theatre & AV Systems)
- Music Production (New creative possibilities through GUI and combination of different effects)

There are several techniques already in use for correction of response curves by arbitrarily specified filters which mostly fall into:

- Use of 2nd order Bell EQs
  This is a long, tedious and skilled process as each time a new EQ is added it also has interaction with all other EQs. In addition, most required correction is not symmetrical in shape (unlike Bell EQs) making exact matches difficult to achieve
- Use of FIR Filters
  The response of the equipment, room or venue can be captured by measurement system, then inverted to produce the required corrective response and finally turned into an FIR filter by convolution. Unfortunately, this has two weak points:
  - As low frequencies are usually involved, the FIR filter has many taps and the delay through the filter is such that it makes it unusable in many “live” applications where sound latency is an issue
  - There will be a need to adjust the response due to errors and artefacts in the measurement system. It is not possible to make fine adjustments to this type of EQ (which may have 1000s of parameters), so a second layer of EQ and processing needs to be added for correction of these errors

The SmoothEQ does not suffer from any of these problems – see below.

3 SmoothEQ

Features:

- Easy specification of response by adding control handles. The response will pass through these points if sufficient DSP is available.
  [If there is insufficient DSP available it will make the closest approximation possible]
- Minimum phase IIR filters for low delay latency (required in live sound and other areas)
- Dynamically Controllable in Real Time
- Guaranteed: No nasty noises when changing the response dynamically, no matter how severe
- Ability to produce better quality results and much faster than conventional EQ methods for arbitrarily specified responses
- Use of less DSP resource than conventional EQ methods for arbitrarily specified responses
- Ability to easily trim results for fine adjustment without adding a new layer of EQ

4 Oxford Digital EQ V2.0 includes:

- ***SmoothEQ***
- A ***New Graphic EQ*** which operates without interaction of bands
- High and Low-Pass filters with continuously variable slope
- Baxandall-style Tone Control
- High and Low Shelving filters which have continuously adjustable in-band frequency response ‘over’ control.
- Classic ‘bell’ or ‘presence’ filters with continuously variable gain, frequency and Q

Demonstration versions of Oxford Digital EQ V2.0 are available for download (under NDA).

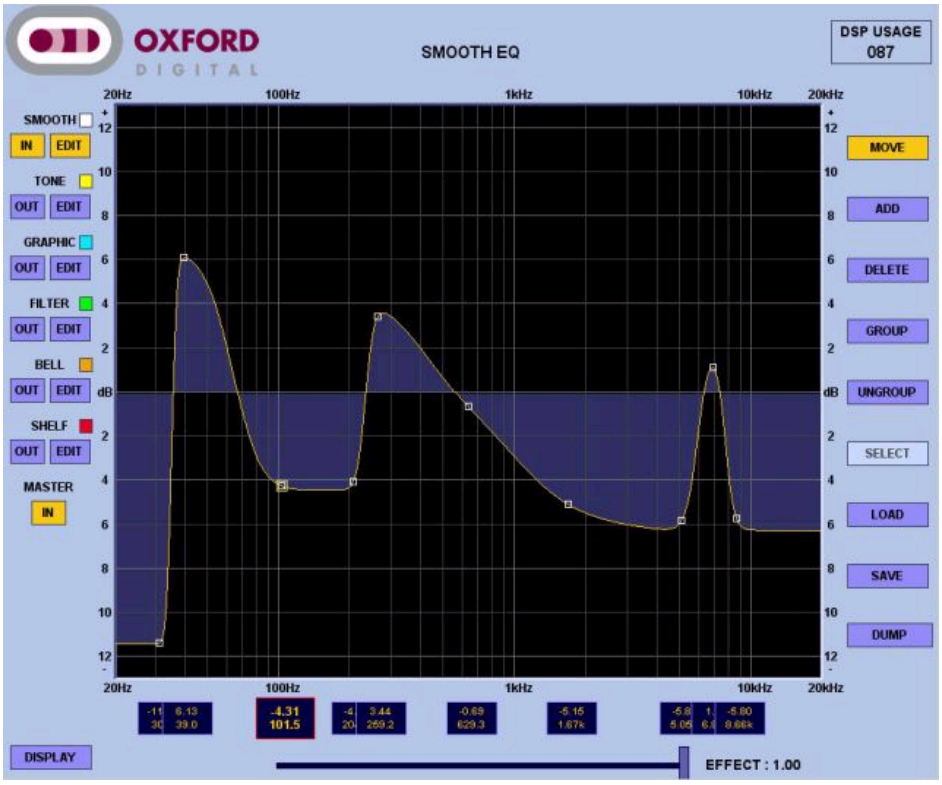

Fig. 1 Example of response of the ***SmoothEQ*** (Yellow line shows actual response)

Fig. 2 Example of response of the ***New Graphic EQ*** (Yellow line shows actual response)

5 Patent Information

- **UK Patent 2458631**
- **US patent 9,203,366**

6 Contact

We are happy to discuss any of the issues above (or indeed any other audio-related issues) in more depth.

For more information (including demo video showing all the EQs) please contact:

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