

## Automated tuning system for rapid equalisation of the spectral response of Voice Activated SMART devices

### Overview

The **MajEq** system is an automation assisted tuning process that radically speeds up the task of equalising the spectral response of **Voice Activated SMART Devices** so that they are compliant with Speech-to-Text providers' (e.g. Nuance, Google) requirements for frequency response.

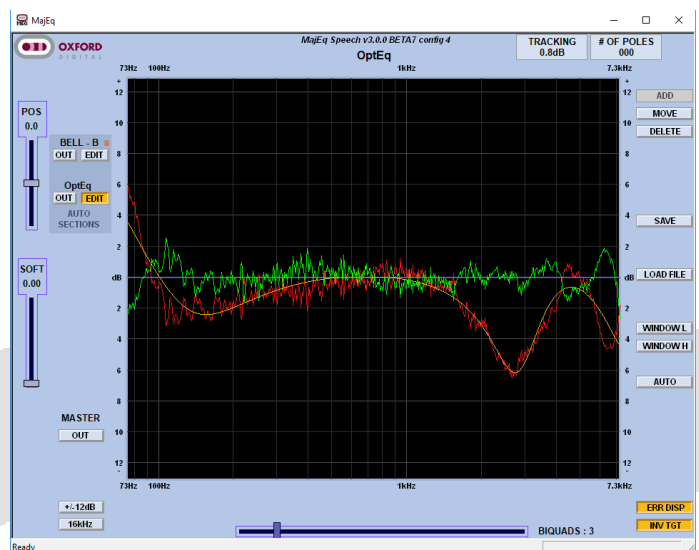
The time taken to 'tune' the remote can be reduced from many hours using conventional parametric EQs for response equalisation to minutes using **MajEq Speech**.

### Features

- Measurement system to capture the frequency response of microphone in the remote
- Import of measurements (as an alternative) from external systems (e.g. Audio Precision, Prism Sound)
- Automatic correction to 'target' EQ curve within a few seconds with guaranteed convergence
- Selection of the useful band where correction is applied (so as to manage response at both LF and near to nyquist)
- Specification of a fixed DSP budget (e.g. 4 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 EQs
- Option for direct manual fine-tuning of compensating results produced by parametric EQs if required
- Editing of the correcting response via familiar EQ controls (parametric EQs) if it is

desired to over-ride the auto-correction – all within the same defined DSP budget

- Indication of Go/NoGo test results for compliant performance
- 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 response; Yellow line: Correcting response using 3 bi-quads; Green line: Deviation from flat response

### Functions

- Taking or ingest of measurement
- Development of required target compensating response including smoothing and windowing
- Selection of number of EQs available for compensation
- Intuitive drag & drop of initial pole-pair placement when in semi- automated mode
- AUTO optimisation for LMS error

Aspects of the **MajEq Speech** system are covered by European Patent No: 2520102 and US Patent No: 9025792.