

REQ-2.2 Resonance Equalizer

Users Manual

REQ-2.2 USERS MANUAL VERSION-4, MAY 2014. CONTENTS COPYRIGHT BUZZ AUDIO LTD 2008.
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Welcome…

Thank you for choosing the Buzz Audio REQ-2.2 Resonance Equalizer. In this manual you will find important information regarding the use of the REQ and we suggest you do read it before using the unit to become familiar with all the controls and their function.

If after unpacking the REQ you find any damage to the unit you should contact your dealer or supplier immediately for advice on what to do.

We also suggest you retain the original packaging at least during the warranty period in case you need to return the unit for service, however we are confident this will not be necessary!

Contents…

Page

1] Installation Precautions 3
2] The Mains Input 3
3] Audio Connections 4
4] Overview 5
5] Controls 6
6] Specifications 8
7] Warranty/Service Information 9
8] Recall Sheets 10
9] Graphs 12

1] Installation Precautions

The REQ-2.2 uses discrete Class A audio amplifiers and these along with the power supply generate a fair amount of heat. Whilst the casing has many ventilation holes, care should be taken to avoid racking the REQ along side other units that run hot. If possible, allow ventilation space between the REQ and other hot running boxes.

If the REQ becomes too hot, internal parameters may change and this may show up as clicks when switching the EQ bands in and out.

The REQ also uses wound chokes (inductors) and because these are coils of wire with many turns, they are prone to picking up mains hum and other noise in the environs. The REQ chokes are contained within steel housings to minimize hum induction, however avoid mounting the REQ next to devices with large unshielded power transformers or switching power supplies.

2] The Mains Input

As a safety precaution your REQ maybe shipped without a mains fuse fitted. Before use, you must select the correct mains voltage for your local supply on the rear panel and fit the correct mains fuse type into the fuse draw for that voltage.

The factory or your dealer may have already set all this up for you but it pays to check it before powering up the REQ.

- Setting the Voltage Selector…

You will need a medium size flat blade screwdriver.

If your local mains voltage is 100V to 120V set the rear panel voltage selector to 110V.
If your local mains voltage is 220V to 240V set the rear panel voltage selector to 220V.

PLEASE NOTE - POWERING UP THE REQ WITH THE WRONG VOLTAGE SETTING MAY CAUSE SEVERE AND PERMANENT INTERNAL DAMAGE!

- Selecting the Correct Fuse…

In the supplied accessories bag you will find;
2x 1 Amp slow blow fuses, FIT for 220V to 240V.
2x 2 Amp slow blow fuses, FIT for 110V to 120V.

Slide out the fuse draw below the IEC power inlet using a small flat blade screwdriver and insert the appropriate fuse into the carrier clip. Note there is also a position in the carrier for a spare fuse (the square tube bit) and we suggest you store the second supplied appropriate fuse here.

Fitting the wrong fuse may result in the fuse blowing on power up or inadequate protection. Fitting a fast blow type fuse may also result in the fuse blowing on power up.

3] Audio Connections

All the XLR connectors on the rear of the REQ-2.2 are balanced and wired as follows;

Pin 1 = Chassis Ground
Pin 2 = Signal Hot (+)
Pin 3 = Signal Cold (-)

The REQ will accept both balanced and unbalanced inputs, however we do recommend the use of balanced lines where ever possible. The REQ has a "looping" input, allowing you to daisy chain it with another device. It also has two output connectors (paralleled) enabling you to feed two separate devices if desired.

From serial number Q1127 (and on some early REQ units), the REQ output will drive both balanced and unbalanced loads due to our unique BE44 Discrete Class A line driver module. If the load is unbalanced, the BE44 will automatically detect this and adjust the output level accordingly. We do recommend however that balanced loads are utilised where ever possible for best sonic performance.

PLEASE NOTE: A LONG TERM SHORT CIRCUIT BETWEEN PIN 2 AND PIN 3 OF THE OUTPUT XLR'S MAY CAUSE DAMAGE TO THE BE44 MODULE.

4] Overview

The REQ-2.2 is a stereo audio equalizer with four “eq” bands per channel plus a high pass filter and unique “saturation” module. Front panel controls allow you to adjust each eq band centre frequency, filter bandwidth (or Q) and the amount of cut/boost. Each element has it’s own on/off switch which removes it from the signal path when off.

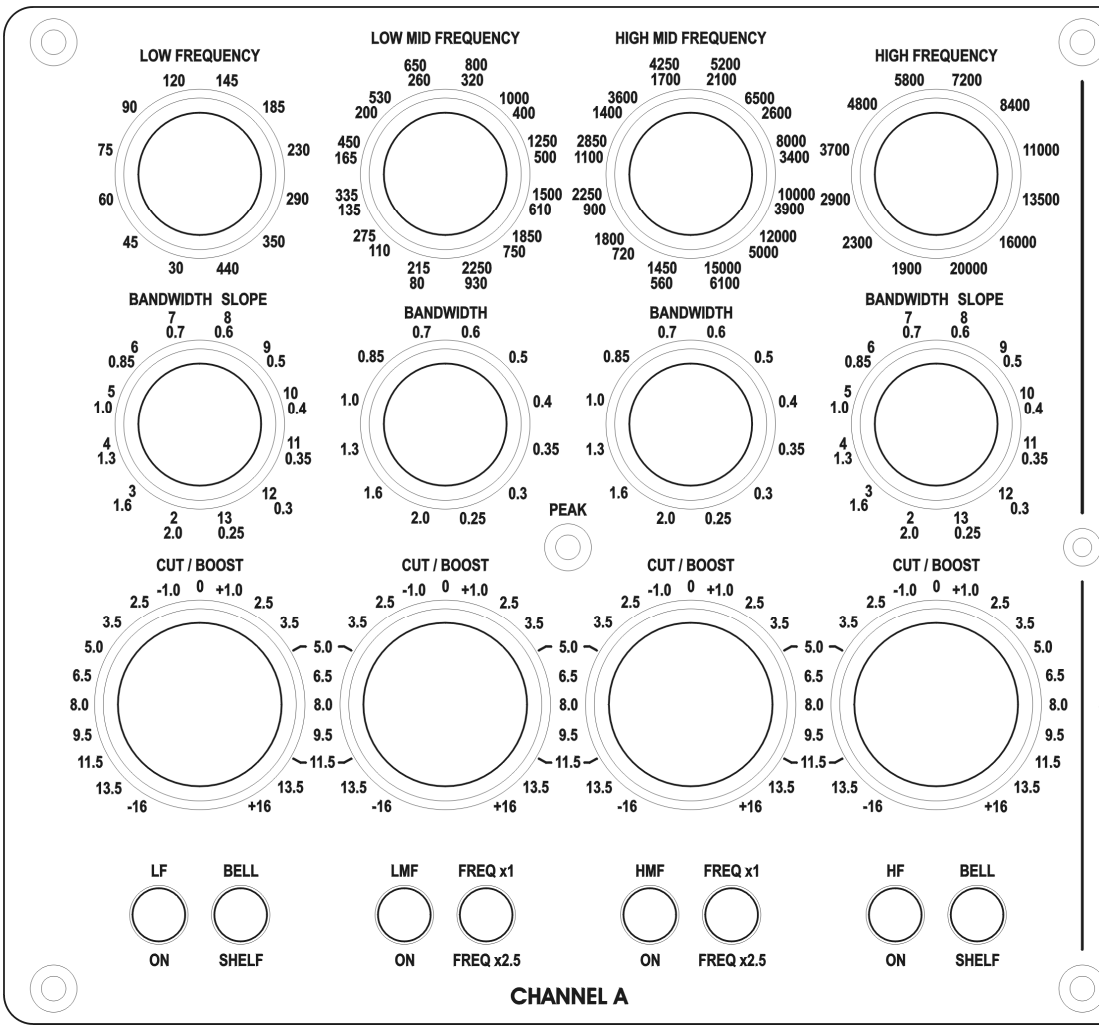
The high and low bands can be switched from a bell filter to a shelving filter, and the bandwidth control reverts to a shelf slope control when in shelf mode. The mid bands can be switched between two frequency ranges as indicated on the front panel.

There are two versions of the REQ, the standard version and a mastering version. The differences between the two versions are the high pass filter turn over frequencies (see graphs at the end of this manual), and the cut/boost controls. The mastering version utilizes a 23 position stepped attenuator (+/-8dB range) for the cut/boost control, whilst the standard version offers a continuously variable +/-16dB range with centre detent.

The REQ uses real chokes and capacitors in a parallel resonant circuit configuration to generate the eq shapes, and this is why it is called the Resonance Equaliser. Whilst difficult to implement with adjustable bandwidth, the sound of these passive resonate circuits is far superior to that of electronically simulated filters.

Unique to the REQ-2.2 is the saturation module which when engaged, adds subtle amounts of harmonic distortion to the signal and also alters the low frequency response (see graphs for detail). The saturation module utilizes a steel core transformer driven by a “single ended” amplifier to achieve this effect, and is useful in creating a more “vintage” sound. The effect of the saturation is dynamic in that the higher the signal level, the greater the effect will be.

5] Controls



EQ Band Controls

FREQUENCY – each band has a 12 position frequency control which sets the centre frequency of the filter. The two mid bands have two ranges of frequency, and the blue lettering applies when the **FREQ x2.5** switch is illuminated. **Please note** that if the **FREQUENCY** switch is parked between clicks (or detents) the **ON** and **FREQ x2.5** pushbuttons will not function.

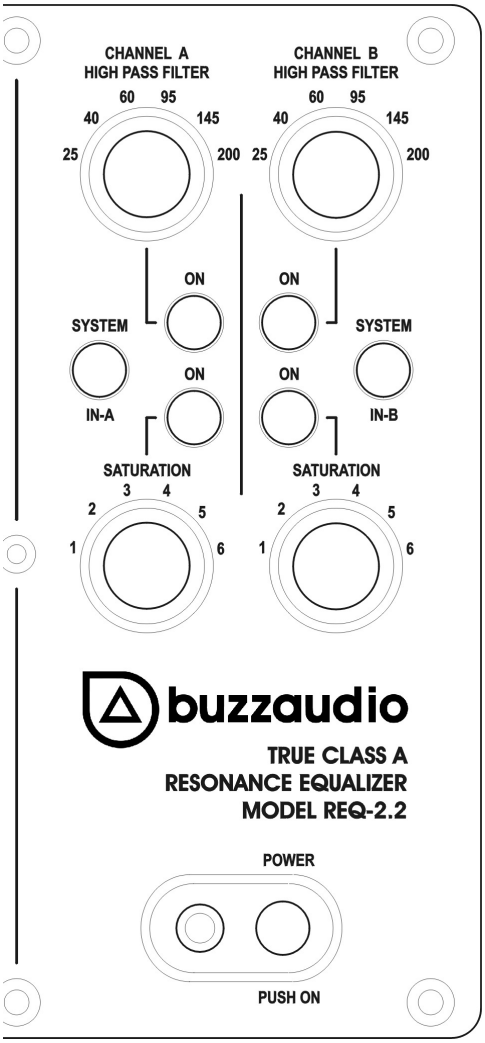
BANDWIDTH (low mid and high mid) – a 12 position switch to set the width of the bell filters ranging from 2 octaves to 0.25 octaves wide. See the graphs at the end of this manual for more detail.

BANDWIDTH/SLOPE (low and high bands) – the low and high bands can be switched into shelf mode (**BELL/SHELF** switch illuminated), and the bandwidth control reverts to a shelf slope control in this mode. Position 2 is a steep slope whilst position 13 is a more gentle curve. See the graphs at the end of this manual for more detail.

CUT/BOOST – adjusts the amount of eq applied to the signal. The above drawing shows the standard version with +/-16dB range. The mastering version of the REQ has a stepped +/-8dB range.

ON – when this switch is illuminated, the associated eq band is engaged into the signal path. When switched off, the eq band is completely removed from the signal path.

PEAK – this red LED will illuminate when levels within the REQ circuitry approach +22dBu warning of possible internal overload. Levels are monitored at critical points throughout the REQ signal path.



Master Section Controls

HIGH PASS FILTER – a 6 position switch to select roll off frequency of the high pass filter (HPF). The associated ON switches engages the filter when illuminated. The drawing above shows the HPF frequency choices for the

standard version. The mastering version has a different set of frequencies optimized for stereo program equalisation. See the graphs at the end of this manual for more detail.

SYSTEM – these switches are used to completely bypass the REQ. When not illuminated, the REQ input XLR connectors are directly connected to the output XLR connectors providing a hard wire bypass. Note that the REQ still does receive signal at it's input when bypassed.

SATURATION – this 6 position switch selects the type of saturation applied to signal. The associated **ON** switches engages the saturation circuit when illuminated. The saturation control changes the low frequency response of the REQ as well as introducing low frequency harmonics generated by the steel audio transformer. See the graphs and specifications for detail.

SWITCH LINKING – from REQ serial number Q1115, a new system control board has been fitted which allows the **HIGH PASS FILTER**, **SYSTEM** and **SATURATION** in/out switches to be linked. Once linked, you only need to push either the A or B channel switches to change both channels together. To link the functions, press and hold down any of the six switches for 4 seconds. To un-link, press and hold down again any of the six switches.

6] Specifications

Frequency Response
Measured with all eq bands ON set flat, Saturation and HPF OFF .....5Hz to 125kHz +0.2/-3dB

See graphs for typical eq and HPF frequency response measurements.

Harmonic Distortion
At +10dBu, Saturation OFF .....100Hz 0.007%...1kHz 0.004%...10kHz 0.007%...100kHz 0.013%
Saturation ON POS-1 .....20Hz 1.5%...100Hz 0.07%...1kHz and up 0.01%
Saturation ON POS-2 .....20Hz 1.5%...100Hz 0.14%...1kHz and up 0.01%
Saturation ON POS-3 .....20Hz 1.5%...100Hz 0.16%...1kHz and up 0.01%
Saturation ON POS-4 .....20Hz 1.6%...100Hz 0.17%...1kHz and up 0.01%
Saturation ON POS-5 .....20Hz 1.7%...100Hz 0.18%...1kHz and up 0.01%
Saturation ON POS-6 .....20Hz 2.0%...100Hz 0.22%...1kHz and up 0.01%

Maximum Input Level.....+25dBu
Input Impedance .....approx 20k ohms
Maximum Output Level.....+32dBu balanced…+26dBu unbalanced
Output Impedance.....approx 70 ohms
Input Common Mode Rejection (ref 0dBu) ..... 100Hz -65dB…1kHz -65dB…10kHz -60dB
Noise all bands ON set flat.....-110dB below max input level A weighted

General
Power requirements ..... 115V/230V selectable on rear panel
Dimensions.....4U rack mount, 300mm deep

0dBu = 0.775V RMS in these specifications. Specifications are typical of a production unit, and subject to change if we improve something.

7] Service Information

We are confident that you will receive many years of trouble free operation from your unit. If however you experience any technical problem with your REQ, contact your dealer or Buzz Audio for recommendations on what to do. The modular nature of the REQ construction means most electronic faults can be easily repaired by swapping out the circuit boards.

For on line support visit our web site; www.buzzaudio.com

Buzz Audio, PO Box 6677, Wellington 6141, New Zealand.
Phone +64+4+472-3084. Email; support@buzzaudio.co.nz

8] Product Warranty

- Disclaimer

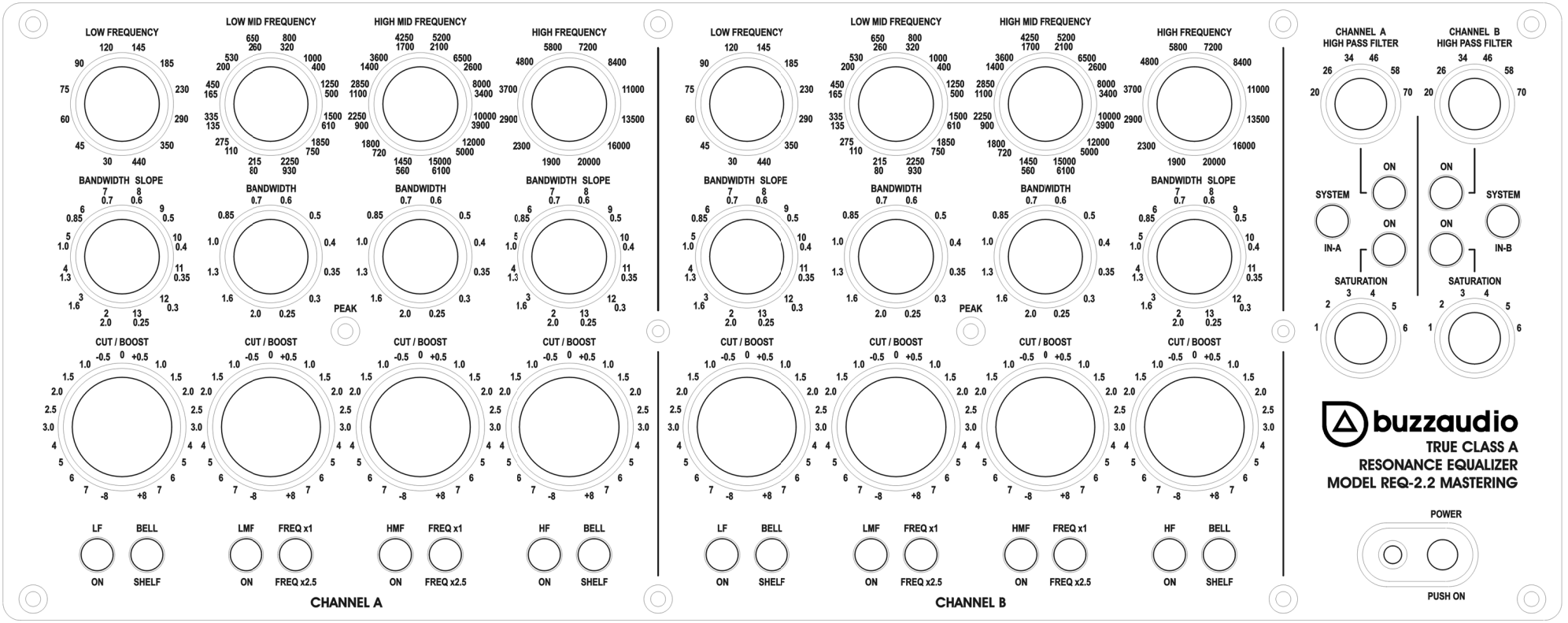
Buzz Audio is not liable for any damage to microphones, amplifiers, consoles, speakers or any other equipment and/or electric shock to humans that is caused by negligence or improper installation and/or use of the REQ-2.2 Resonance Equalizer.

- Standard Product Warranty

Buzz Audio guarantees the REQ-2.2 Resonance Equalizer to be free of defective materials and/or workmanship for a period of 1 year (12 months) from the date of sale, and will replace defective parts and repair malfunctioning products under this warranty when the defect occurs under normal installation and use – provided the unit is returned to our factory (or duly authorised service centre) via prepaid transportation with a copy of the proof of purchase, ie, sales receipt. This warranty provides that examination of the returned product must indicate, in our judgement, a manufacturing defect. This warranty does not extend to any product that has been subjected to misuse, neglect, accident, improper installation, or where the date code has been removed or defaced. The standard warranty is NOT transferable.

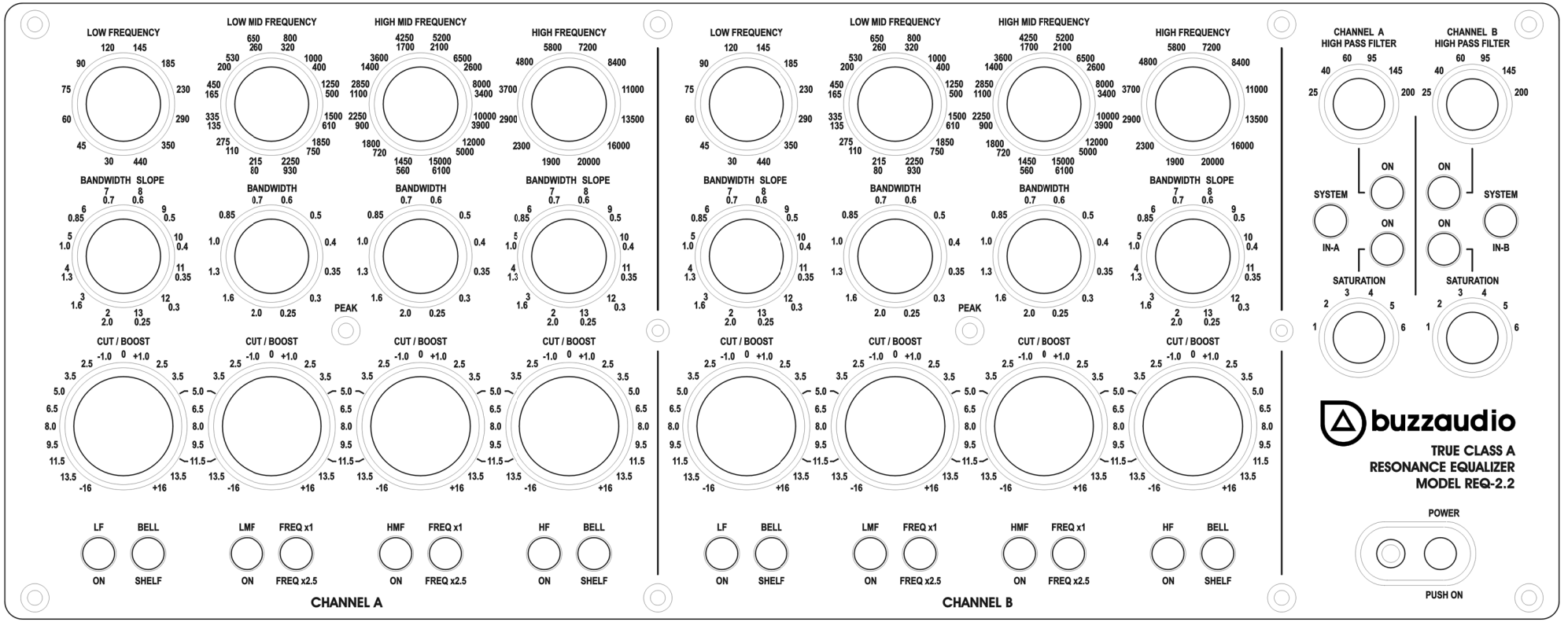
- Product Warranty Extension

The above Warranty may be extended to a period of 2 years (24 months) from date of sale provided the enclosed Warranty Registration card is completed and returned to the office of Buzz Audio within 4 weeks (28 days) from purchase date. Alternatively, you may Register your purchase on-line at our web-site www.buzzaudio.com. The Extended Warranty is transferable.



Date.....Artist.....Track.....

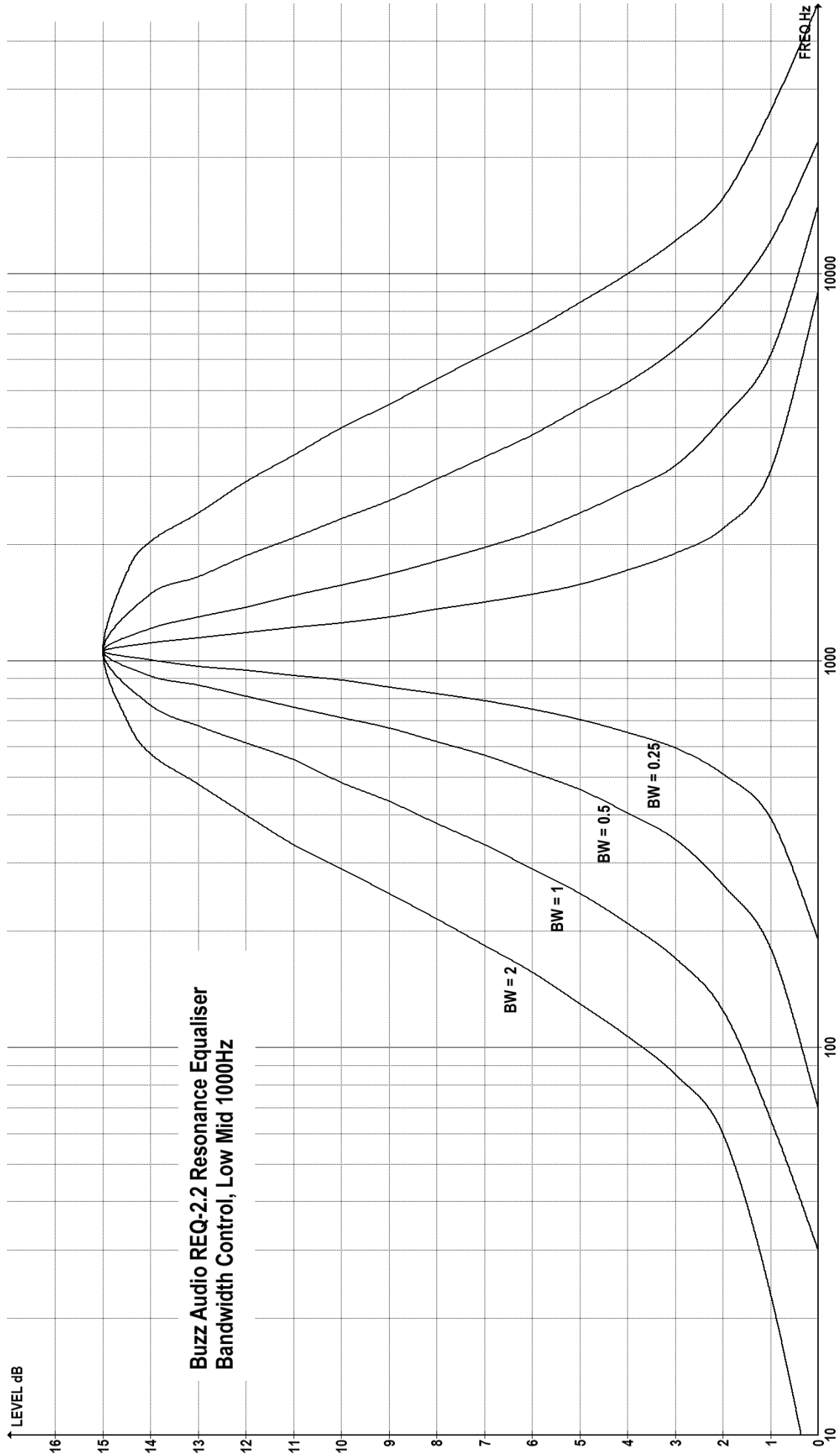
Notes

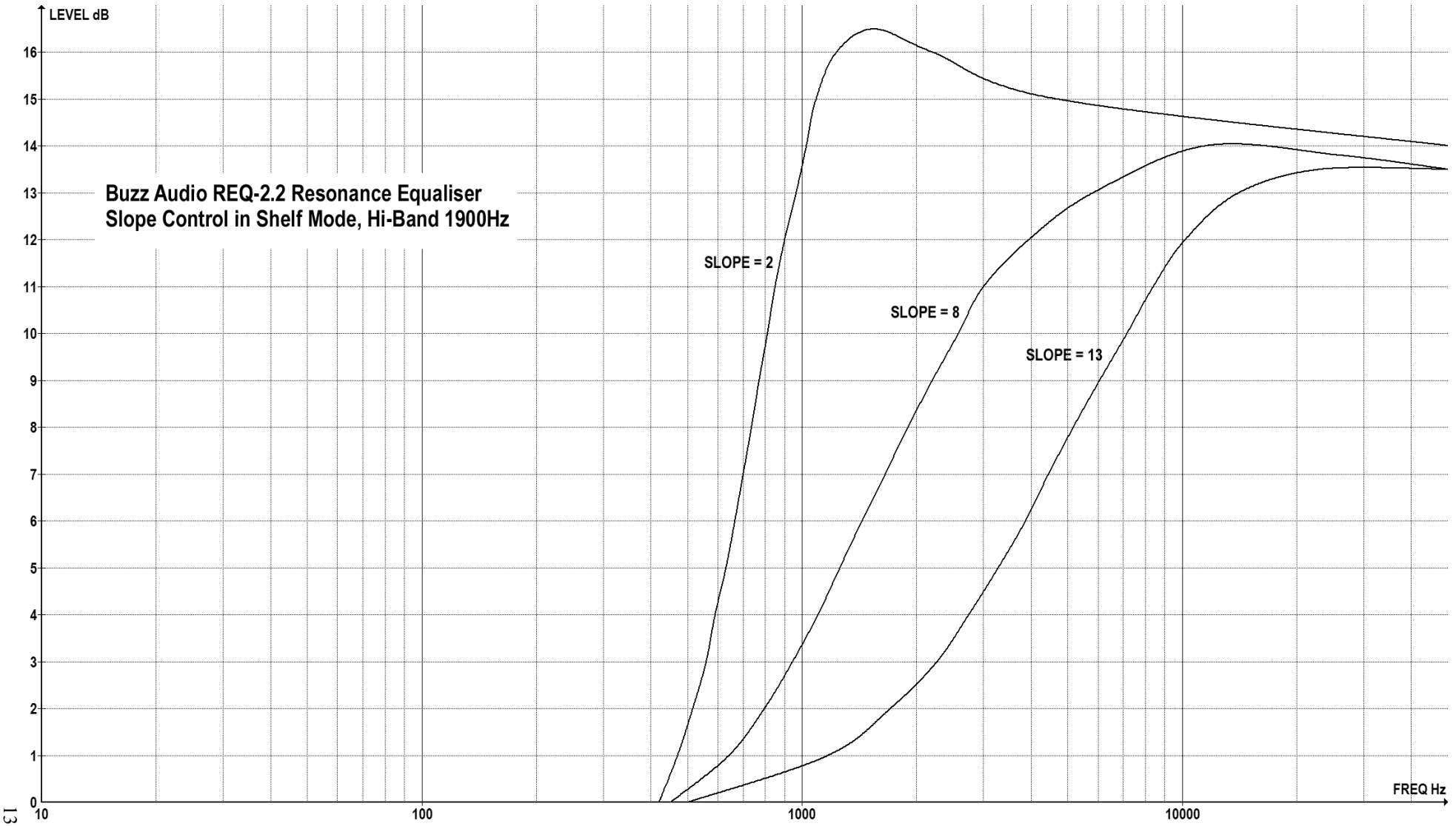


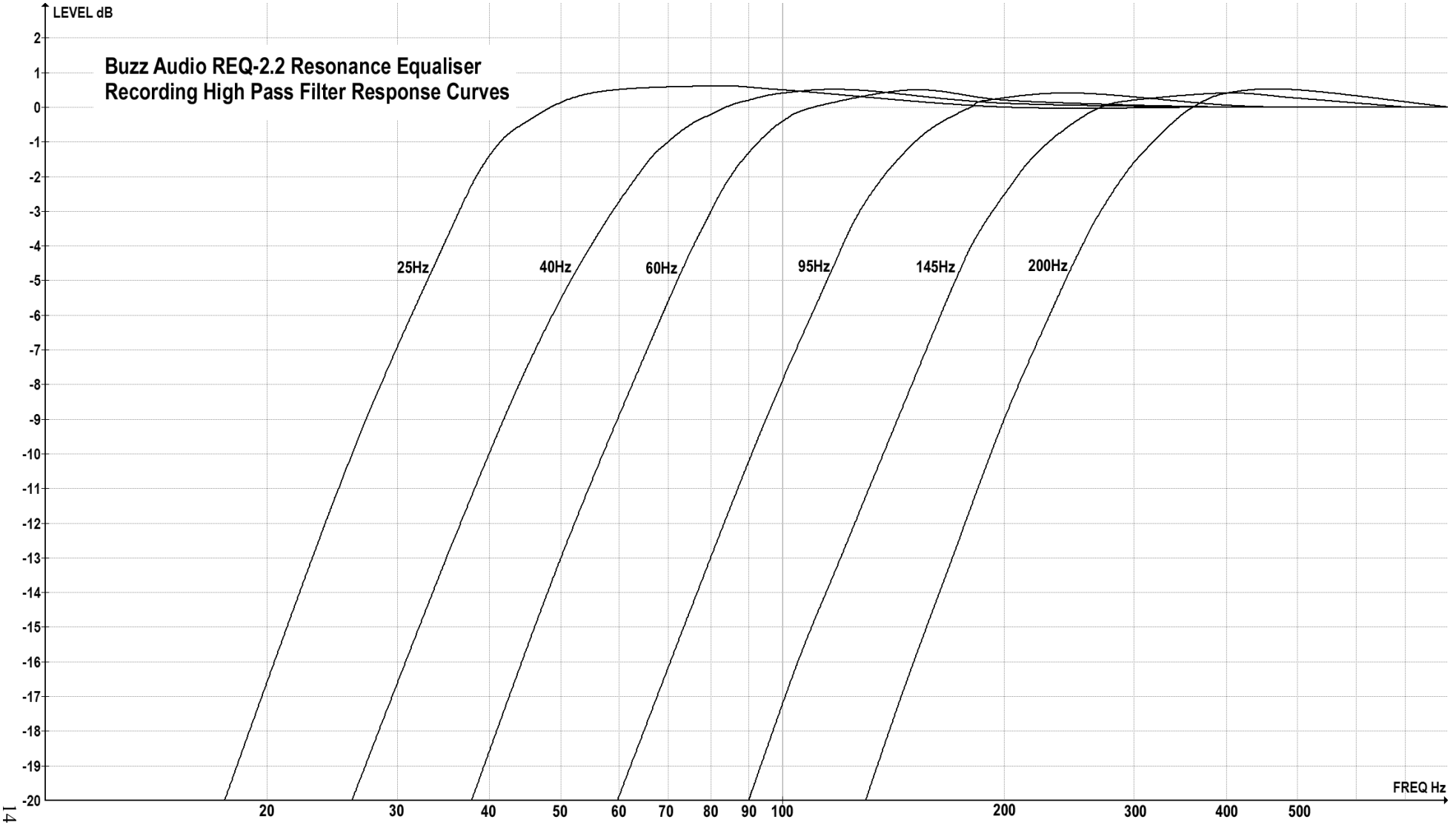
Date.....Artist.....Track.....

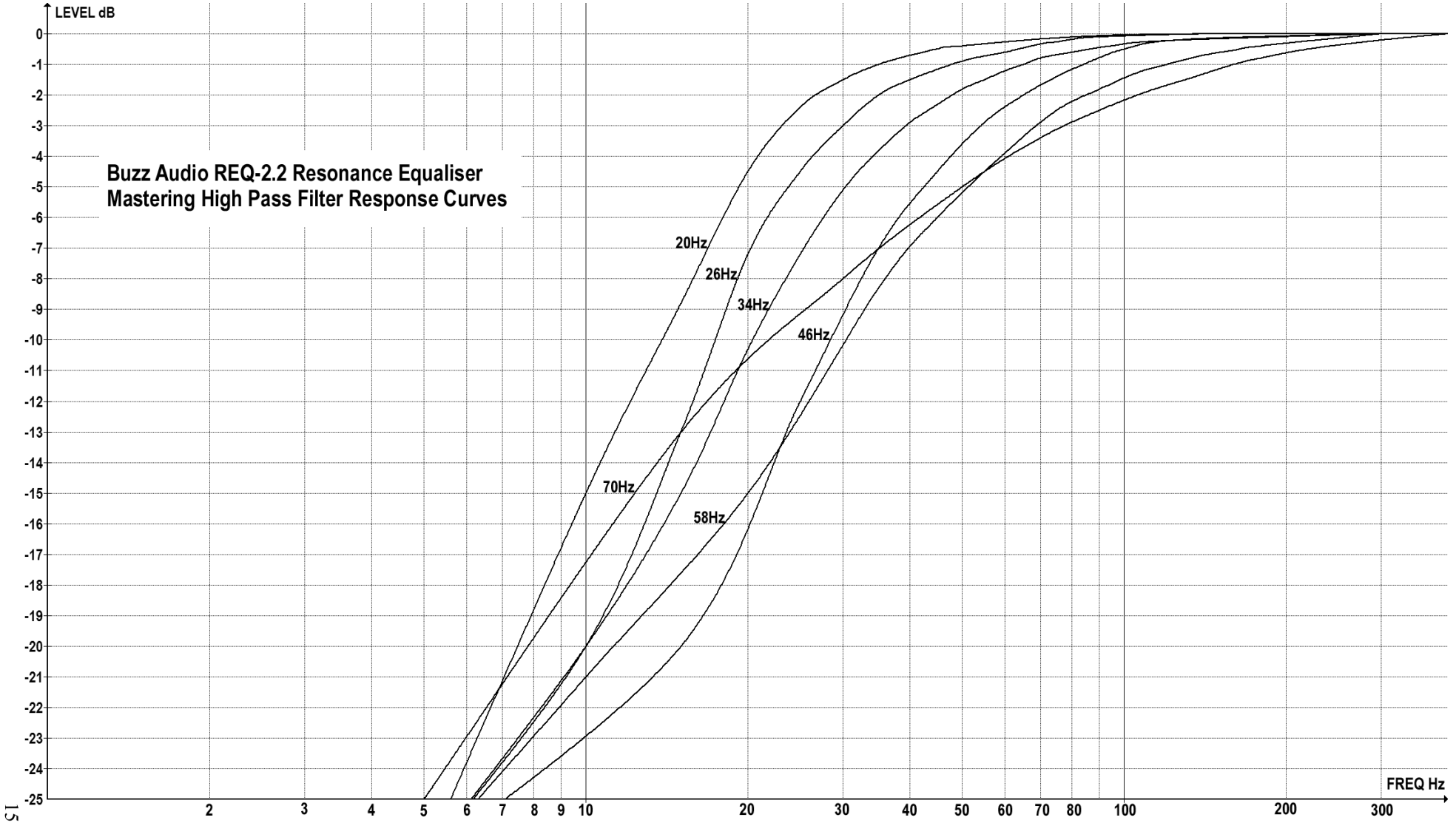
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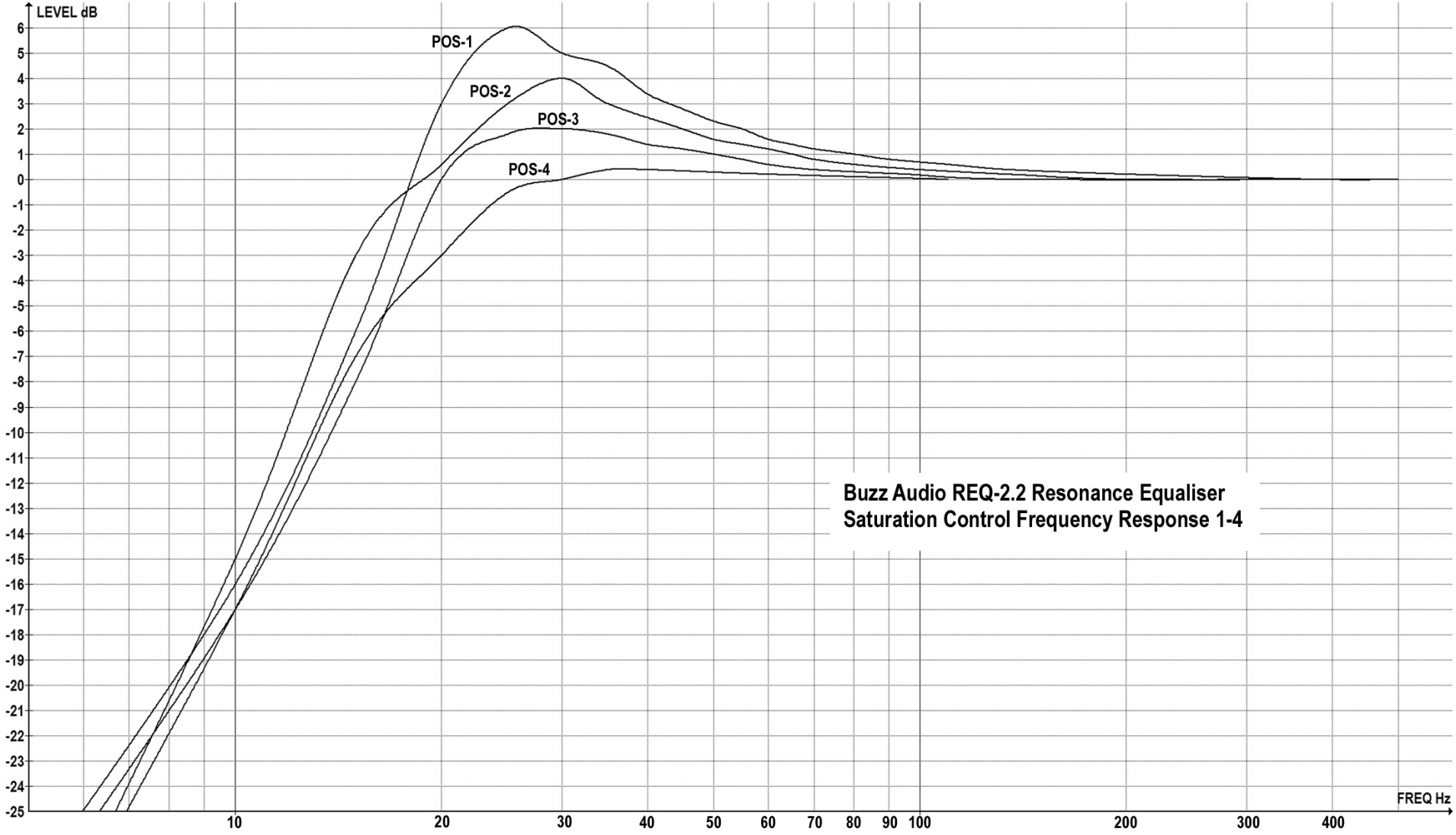
9] Graphs

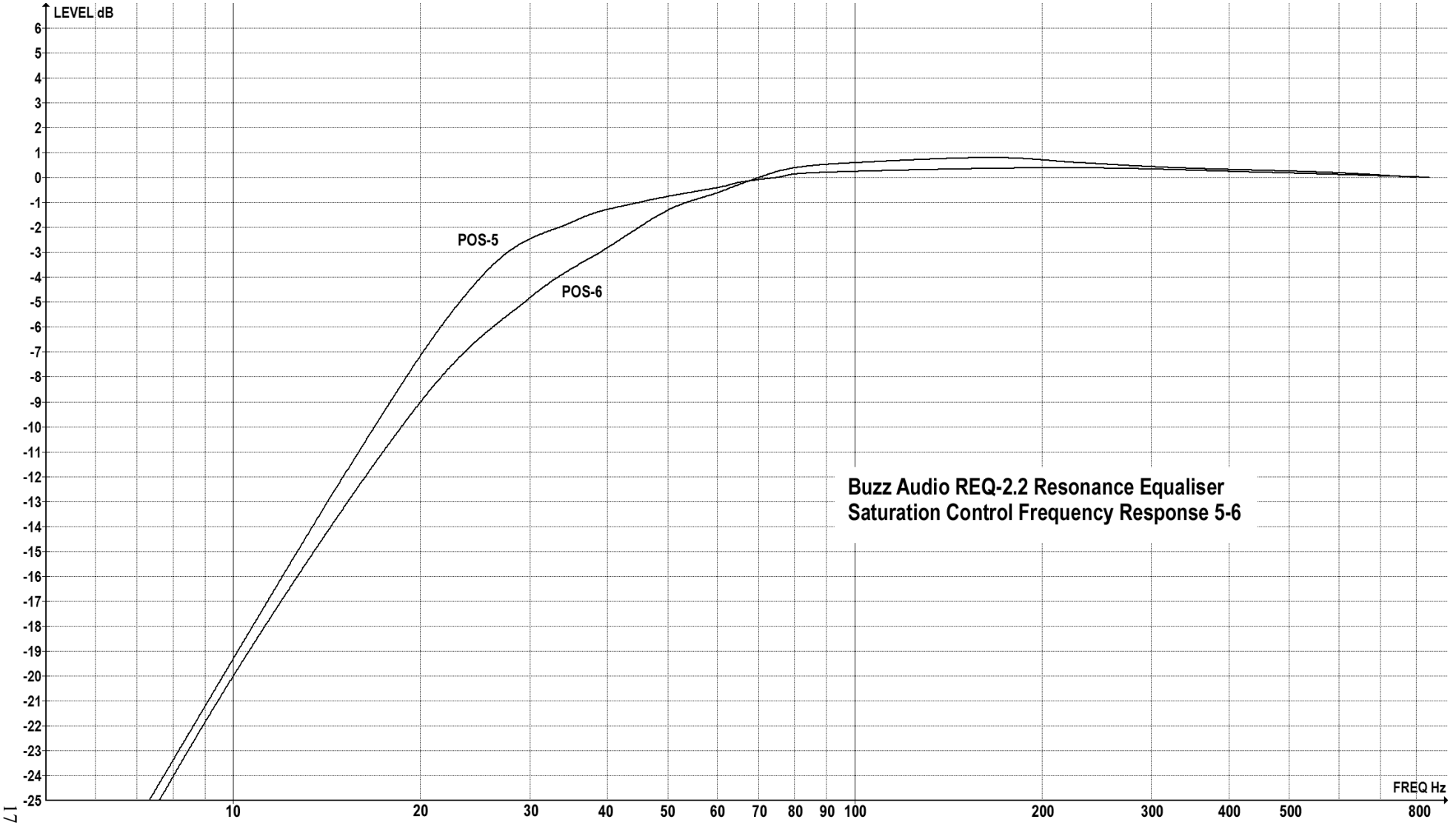

LEVEL dB
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
10
100
1000
10000
FREQ Hz
Buzz Audio REQ-2.2 Resonance Equaliser
Bandwidth Control, Low Mid 1000Hz
BW = 2
BW = 1
BW = 0.5
BW = 0.25


LEVEL dB
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
Buzz Audio REQ-2.2 Resonance Equaliser
Slope Control in Shelf Mode, Hi-Band 1900Hz
SLOPE = 2
SLOPE = 8
SLOPE = 13
10
100
1000
10000
FREQ Hz


LEVEL dB
Buzz Audio REQ-2.2 Resonance Equaliser
Recording High Pass Filter Response Curves
2
1
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
-11
-12
-13
-14
-15
-16
-17
-18
-19
-20
25Hz
40Hz
60Hz
95Hz
145Hz
200Hz
20
30
40
50
60
70
80
90
100
200
300
400
500
FREQ Hz


LEVEL dB
0
-1
-2
-3
-4
-5
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-7
-8
-9
-10
-11
-12
-13
-14
-15
-16
-17
-18
-19
-20
-21
-22
-23
-24
-25
Buzz Audio REQ-2.2 Resonance Equaliser
Mastering High Pass Filter Response Curves
20Hz
26Hz
34Hz
46Hz
70Hz
58Hz
2
3
4
5
6
7
8
9
10
20
30
40
50
60
70
80
100
200
300
FREQ Hz


LEVEL dB
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POS-1
POS-2
POS-3
POS-4
Buzz Audio REQ-2.2 Resonance Equaliser
Saturation Control Frequency Response 1-4
10
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400
FREQ Hz


LEVEL dB
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-24
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POS-5
POS-6
Buzz Audio REQ-2.2 Resonance Equaliser
Saturation Control Frequency Response 5-6
FREQ Hz
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800