MASELEC

MLA-4

Triband
Compressor / Expander
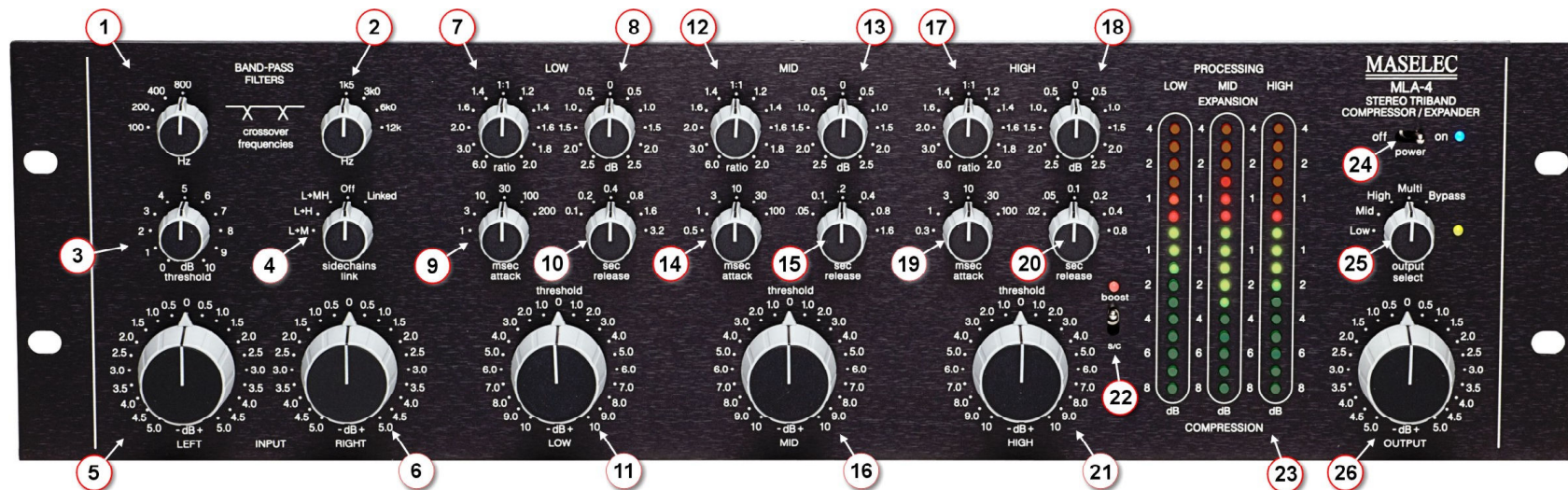
1	Low-to-Mid crossover Frequency	10	Low Frequency Release	19	High Frequency Attack
2	Mid-to-High crossover Frequency	11	Low Frequency Threshold	20	High Frequency Release
3	Master Threshold (all frequencies)	12	Mid Frequency Ratio	21	High Frequency Threshold
4	Linking of Low-Mid-High Side-Chains	13	Mid Frequency Gain	22	High Frequency Side-Chain Boost
5	Left channel Input Gain	14	Mid Frequency Attack	23	Processing Gain Bargraph Meters
6	Right channel Input Gain	15	Mid Frequency Release	24	Power On/Off
7	Low Frequency Ratio	16	Mid Frequency Threshold	25	Output Selector Tri Colour LED
8	Low Frequency Gain	17	High Frequency Ratio	26	Output Gain
9	Low Frequency Attack	18	High Frequency Gain		

Note: All rotary controls are switches using discrete resistors.

DESCRIPTION

The input signal is split into three frequency-bands. Each band is passed through a stereo compressor / expander, where gain and processing can be altered.
The outputs of the compressors / expanders are then re-combined and fed to the outputs.

There are four different frequencies for each of the two crossovers that can be separately selected for the low-to-mid and the mid-to-high bands.

The three frequency-band compressors / expanders have separate controls so that different parts of the audio spectrum can be adjusted and tuned.

With separate gain controls for each frequency-band, the MLA-4 can also be used as an equalizer.

You can always adjust the controls for the separate frequency bands to different settings.
There is no *technical* reason why they should be the same for all frequencies.

Separate Input and Output gain controls, make the MLA-4 easy to use for different operating levels.

Inputs

The inputs are electronically balanced, virtually ground floating, making them perform as if they are transformer coupled, but without the associated colouration, low frequency distortion and restricted bandwidth.
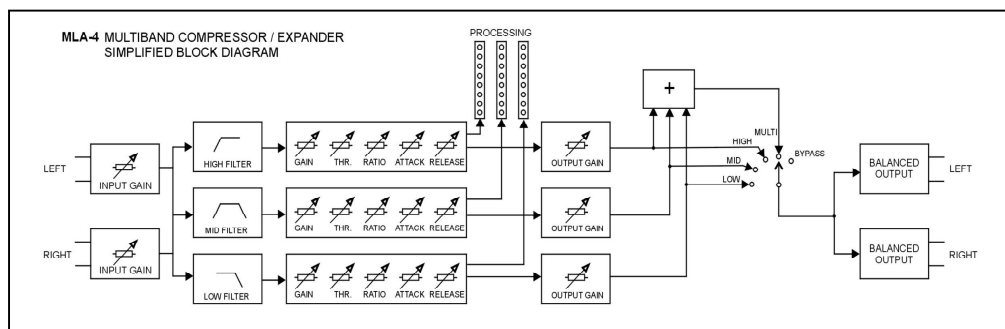The input impedance is 100kohm. Maximum input level is >+29dBu (balanced).

Outputs

The outputs are electronically balanced and can deliver >+28dBu into 600ohm (balanced).
Output impedance is 33ohm (balanced and unbalanced).

The inputs and outputs can be unbalanced by simply grounding either pin 2 or pin 3.
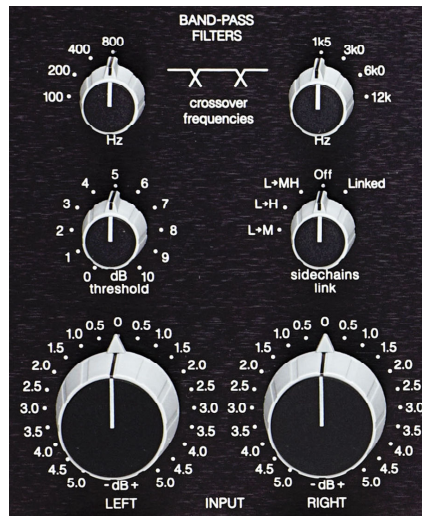
Block Diagram

Sets the **crossover frequency** between LOW and MID bands.
Slope: 6dB/octave

Master Threshold:

Sets the operating point for the three individual frequency-band thresholds.

LEFT input Gain:

Adjusts the gain before the three compressors / expanders.

-5dB to +5dB

Sets the **crossover frequency** between MID and HIGH bands.
Slope: 6dB/octave

Sidechains Link:

Links the sidechains of the frequency bands.

It is not a stereo link.

See below.

RIGHT input Gain:

Adjusts the gain before the three compressors / expanders.

-5dB to +5dB

Crossover Frequencies

The crossover between the frequency bands can be set to four different frequencies for both the lower and higher transitions.

The filters are passive with 6 dB/octave slopes, which ensure smooth and exceptionally accurate summation of the bands and with minimum colouration and a very flat frequency response.

Master Threshold

Use the Master Threshold to set the point at which the three frequency-band thresholds are in convenient positions for the amount of compression / expansion that you want.

CW positions increase the thresholds (which would lead to less gain change).

Sidechains Link

This control links the side-chains from the different frequency bands (it is not a stereo link).

L>M   LOW band compression or expansion is fed to the MID band regardless of any other setting. This can be used to get bass frequencies to duck and 'pump' the MID band.
Note: MID compression or expansion is not fed (the other way) to the LOW band.

L>H   LOW band compression or expansion is fed to the HIGH band regardless of any other setting. Use this setting to get bass frequencies to duck and 'pump' the HIGH band.
Note: HIGH compression or expansion is not fed (the other way) to the LOW band.

L>MH LOW band compression or expansion is fed to the MID and HIGH bands regardless of any other setting.
Use this setting to get bass frequencies to duck and 'pump' the MID and HIGH bands.
Note: MID and HIGH compression or expansion is not fed (the other way) to the LOW band and the HIGH and MID sidechains are not linked

Off   All three frequency bands are separated (normal operation).

Linked All three frequency bands are linked. With this setting all frequencies are compressed and expanded with the same amount. This makes the MLA-4 act (and sound) like a normal full band stereo processor.
However, you can use the three sets of individual frequency-band controls to set how different frequencies affect the overall compression and expansion.
You can use the individual gain controls to equalize the programme in all five modes.

Input Gain

The input gain, before the compressors, can be adjusted between –5 dB and +5 dB in ½ dB steps. Separate controls for Left and Right channels.

LOW FREQUENCY CONTROLS
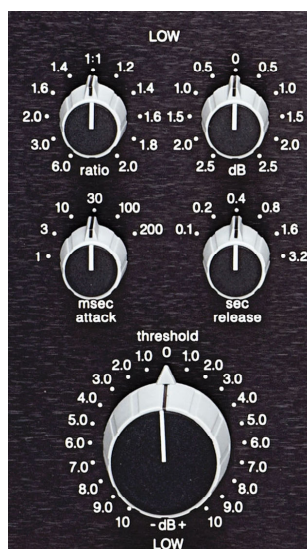
LOW frequency Ratio.
1:1 = No processing
1.4:1 to 6:1 ratios (compression) CCW
1:1.2 to 1:2 ratios (expansion) CW

LOW frequency Attack.
Six different attack times.
1 msec to 200 msec.

LOW frequency Threshold.
21 positions: -10dB to +10dB

LOW frequency Gain.
Use for makeup gain
or equalization.
11 positions: -2.5dB to +2.5dB

LOW frequency Release.
Six different release times.
100 msec to 3.2 sec.

LOW frequency Ratio

Compression 1:4 to 6:1 (five positions) and Expansion 1:1.2 to 1:2 (five positions).

The centre 1:1 position can be used to switch off the LOW processing.

LOW frequency Attack

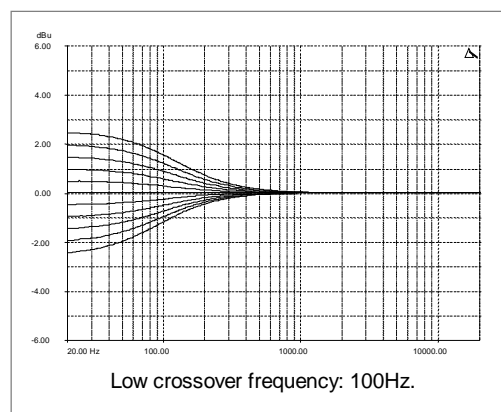The attack time can be varied between 1 msec and 200 msec in six steps.

For longer attack times you will probably have to adjust the threshold to a lower value (CCW) to maintain some processing.

LOW frequency Gain

The gain of the low frequency band can be varied between –2.5 dB and +2.5 dB in eleven ½ dB steps.
The net effect is similar to a passive equalizer.
This control does not affect the compression or expansion.

Low crossover frequency: 100Hz.

LOW frequency Release

The release time can be varied between 100 msec and 3.2 sec in six steps.
Programme dependent circuits reduce the distortion and speed up the release for short duration transients.
For less overall 'equalized' sounds; try shorter release times.

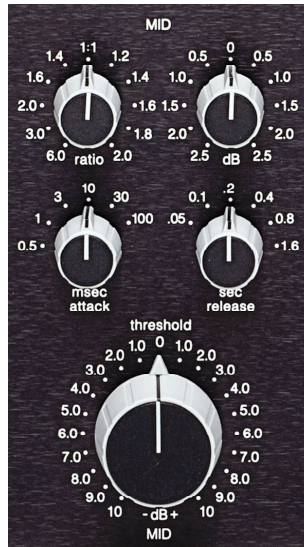## MID FREQUENCY CONTROLS

MID frequency Ratio.

1:1 = No processing

1.4:1 to 6:1 ratios (compression) CCW

1:1.2 to 1:2 ratios (expansion) CW

MID frequency Gain.

Use for makeup gain
or equalization.

11 positions: ‐2.5dB to +2.5dB

MID frequency Attack.

Six different attack times.

0.5 msec to 100 msec.

MID frequency Release.

Six different release times.

50 msec to 1.6 sec.

MID frequency Threshold.

21 positions: ‐10dB to +10dB

MID frequency Ratio

Compression 1:4 to 6:1 (five positions) and Expansion 1:1.2 to 1:2 (five positions).

The centre 1:1 position can be used to switch off the MID processing.

MID frequency Attack

The attack time can be varied between 0.5msec and 100 msec in six steps.

For longer attack times you will probably have to adjust the threshold to a lower value (CCW)
to maintain some processing.
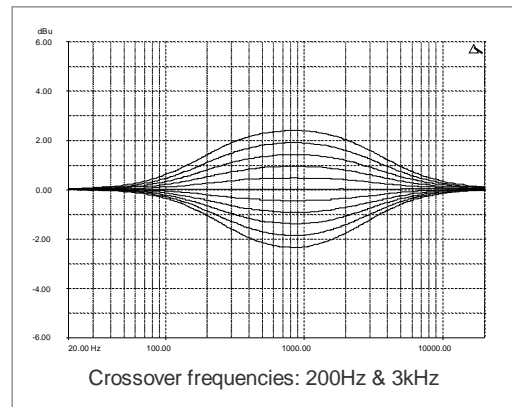
MID frequency Gain

The gain of the mid frequency band can be varied
between –2.5 dB and +2.5 dB in eleven ½ dB steps.

The net effect is similar to a passive equalizer.

Moving the crossover frequencies does not affect the
'Q' in the same way as a normal equalizer

With the crossover frequencies 'spread' wider you
can get a very natural, yet powerful, adjustment of the
MID spectrum.

This gain control does not affect the compression
or expansion.

Crossover frequencies: 200Hz & 3kHz

MID frequency Release

The release time can be varied between 50 msec and 1.6 sec in six steps.

Programme dependent circuits reduce the distortion and speed up the release for short duration
transients.

For less overall 'equalized' sounds; try shorter release times.

HIGH frequency Ratio.

1:1 = No processing

1.4:1 to 6:1 ratios (compression) CCW

1:1.2 to 1:2 ratios (expansion) CW

HIGH frequency Gain.

Use for makeup gain
or equalization.

11 positions: -2.5dB to +2.5dB

HIGH frequency Attack.

Six different attack times.

0.3 msec to 100 msec.

HIGH frequency Release.

Six different release times.

20 msec to 0.8 sec.

HIGH frequency Threshold.

21 positions: -10dB to +10dB

High Frequency Side Chain Boost.

Toggle switch.

Increases high frequency compression.

Red LED indicator

HIGH frequency Ratio

Compression 1:4 to 6:1 (five positions) and Expansion 1:1.2 to 1:2 (five positions).

The centre 1:1 position can be used to switch off the HIGH processing.

HIGH frequency Attack

The attack time can be varied between 0.3 msec and 100 msec in six steps.

For longer attack times you will probably have to adjust the threshold to a lower value (CCW) to maintain some processing.

HIGH frequency Gain

The gain of the high frequency band can be varied between −2.5 dB and +2.5 dB in eleven ½ dB steps.

The net effect is similar to a passive equalizer.

This gain control does not affect the compression or expansion.

High crossover frequency: 6kHz
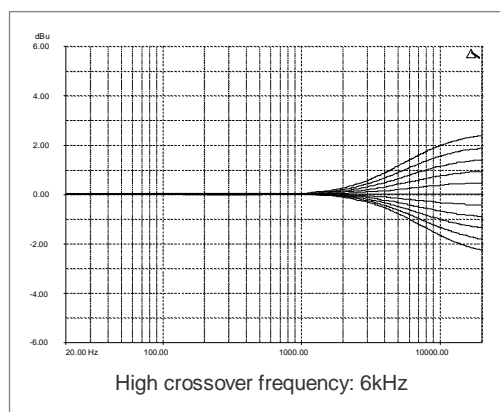
HIGH frequency Release

The release time can be varied between 20 msec and 0.8 sec in six steps.

Programme dependent circuits reduce the distortion and speed up the release for short duration transients.

For less overall 'equalized' sounds; try shorter release times.

S/C Boost

A high frequency boost in the side chain makes higher frequencies compress or expand more.

High frequencies are usually short duration transients or at relatively low levels.

Without the S/C Boost you would have to lower the threshold, which could cause excessive compression or expansion from (lower) frequencies that are closer to the crossover frequency.

PROCESSING METERS

Processing (gain change) is shown on three bargraph meters, each with 16 LEDs.

Expansion is displayed on 6 amber LEDs.

The range is 0dB to 4dB in ½ dB and 1 dB steps.

Compression is displayed on 10 green LEDs.

The range is 0dB to 8dB in ½ dB and 1 dB steps.

Note: When the **link** is engaged, both expansion and compression can be displayed in *the same* frequency band.

The example shown is for the link set to **L->MH** with compression in the Low band *and* the Mid and High bands expanding.
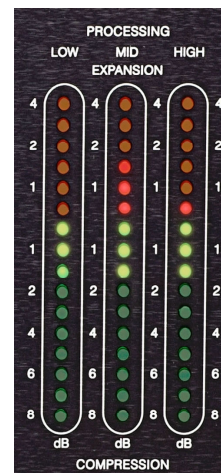
OUTPUT SECTION

Output Select,
Multiband output or individual frequency bands

Output Gain.

Adjusts the gain for both channels *after* the processors.

-5dB to +5dB
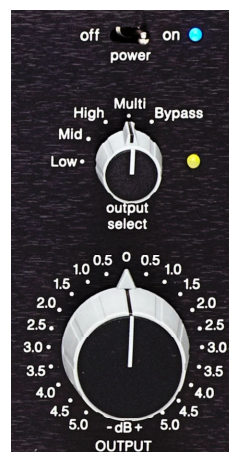
Power on/off
Blue LED indicator

Tri-colour LED

Red: bypass
Green: multi
Orange: low, mid or high

The MLA-4 is **automatically bypassed** when the power is switched off.

Output Select

Low:	The output from the LOW frequency processor is fed to the output.
Mid:	The output from the MID frequency processor is fed to the output.
High:	The output from the HIGH frequency processor is fed to the output.
Multi:	The output of the Multiband Compressor / Expander is fed to the output.
Bypass:	The whole unit is galvanically bypassed.

Monitoring the outputs from the individual frequency bands can make it easier to select crossover frequencies and setting up the three processors.

The individual outputs can also be used to create band-pass sounds for effects.

Output Gain

The output gain, post compressors and expanders, can be adjusted between:
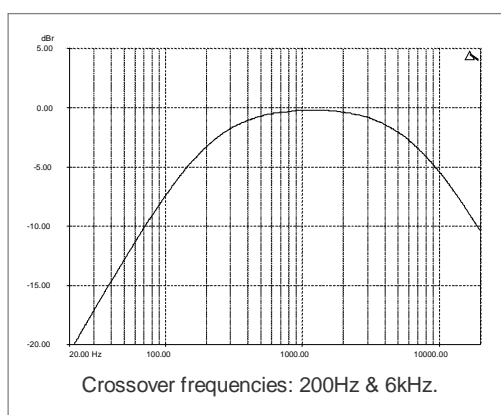–5dB and +5dB in ½ dB steps.

FILTERS

The filters are passive, with a slope of 6dB/octave. This is the optimum configuration for accurate summing of the three bands.
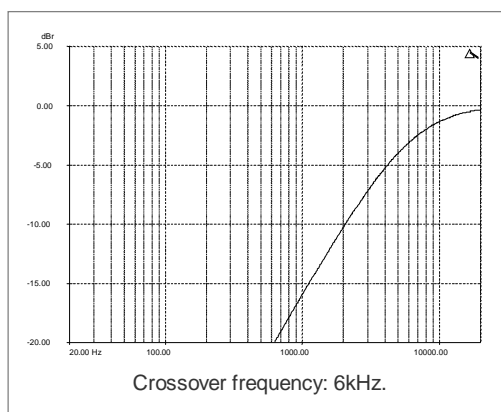
LOW frequency Filter

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Crossover frequency: 200Hz.

MID frequency Filter

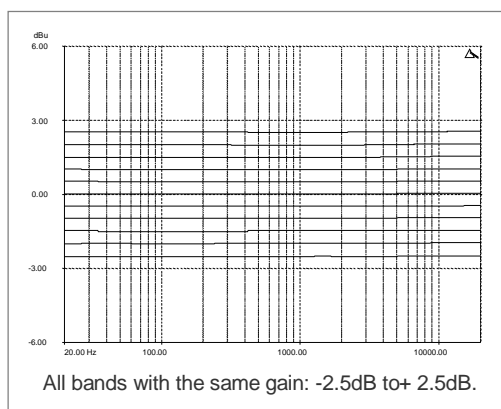Crossover frequencies: 200Hz & 6kHz.

HIGH frequency Filter

Crossover frequency: 6kHz.
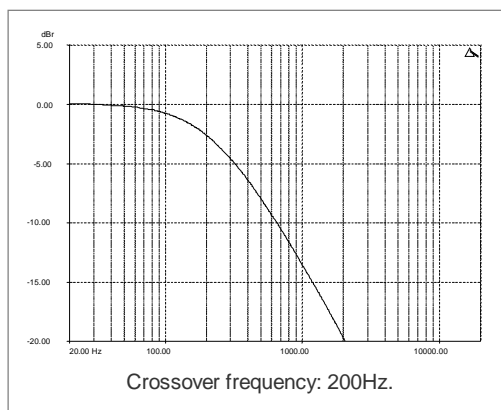
Multiband output
(3-band sum)

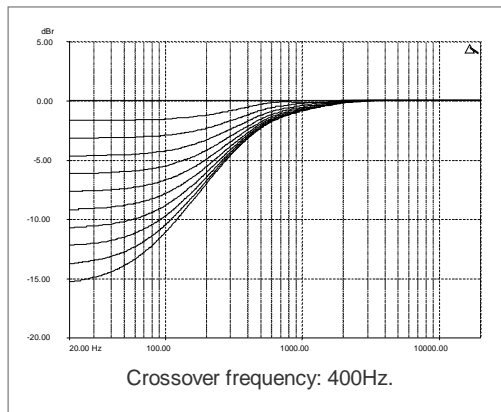All three filters set to the same gain: -2.5dB to +2.5dB (11 x 1/2dB steps)
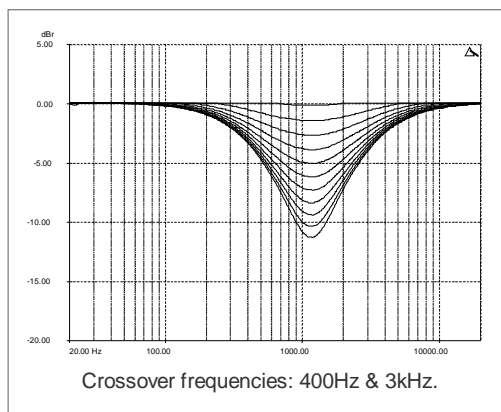
Frequency response is absolutely flat.

All bands with the same gain: -2.5dB to+ 2.5dB.

COMPRESSION

LOW frequency Compression

Low   6:1
Mid   1:1
High 1:1

Crossover frequency: 400Hz.

MID frequency Compression

Low   1:1
Mid   6:1
High 1:1

Crossover frequencies: 400Hz & 3kHz.

HIGH frequency Compression

Low   1:1
Mid   1:1
High 6:1

Crossover frequency: 3kHz.
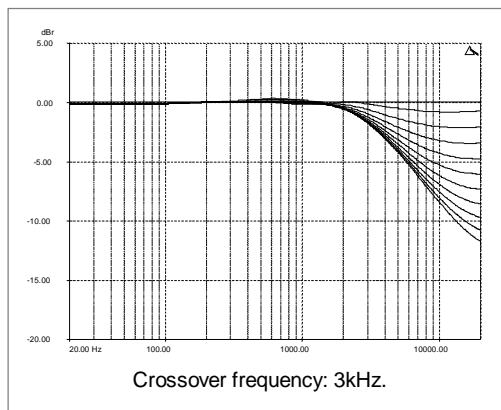
High frequency Compression
with and without S/C boost

S/C boost increases HF compression.
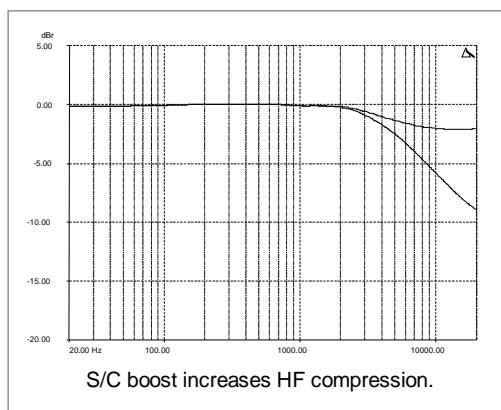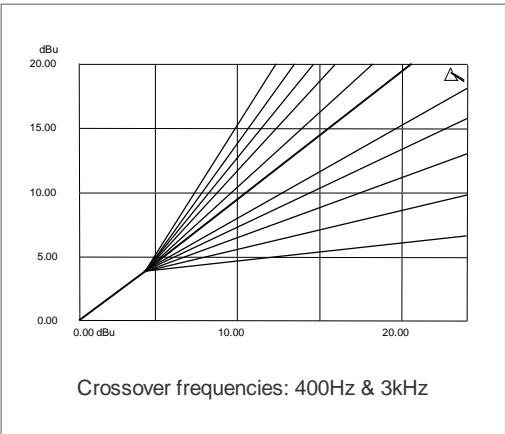
Compression / Expansion

Multiband output compressed:
All three frequency bands
set to the same threshold
and ratio.

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Crossover frequencies: 400Hz & 3kHz
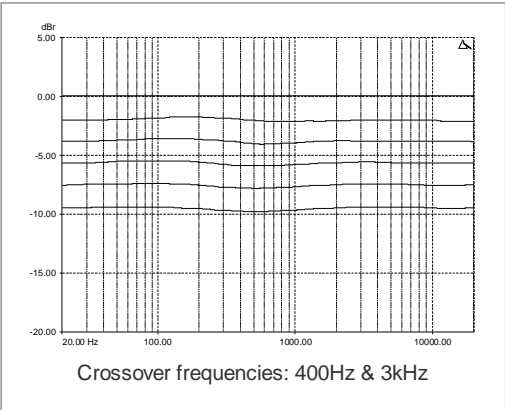
Ratios:
All three frequency bands
set to the same threshold
and ratios.

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Crossover frequencies: 400Hz & 3kHz

Technical Specification

Input Impedance	**100 kohm**
Maximum input level	**+29dBu (0dBu = 0.775V)**
Thresholds (0dB input gain)	**-10dBu to +20dBu**
Typical THD (ratio 1:1)	**<-90dB**
Frequency Response	**within 0.05dB 20Hz to 20kHz**
Bandwidth	**greater than 1Hz to 500kHz**
Typical Noise	**-90dBu**
Maximum Output level	**+28dBu**
Output impedance	**33 ohm**

Subject to change without notice.