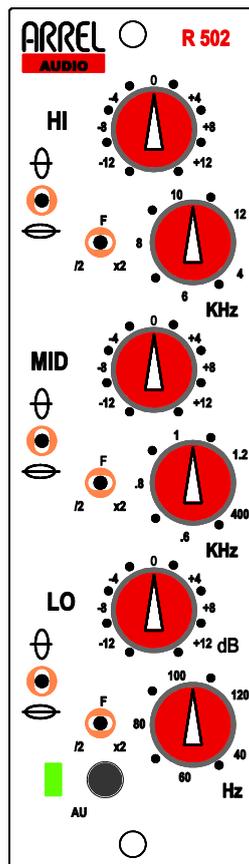**ARREL AUDIO**

REAL Innovation

R-502 3 Band Parametric Equalizer (9 center frequencies)

User Manual

Issue 0.2

SAFETY INSTRUCTIONS

⚠ *WARNING*

Always follow the precautions listed below to avoid any possibility of serious injury or even death from electrical shock, short-circuiting, damages, fire or other hazards. These precautions include, but are not limited to, the following:

- Do not expose the instrument to liquids and rain. Do not use it near water or in damp or wet conditions, or place containers on it containing liquids. If any liquid seeps turn off the power and unplug the power cord from the AC outlet.
- Do not put burning items, such as candles, on the unit. A burning item may fall over and cause a fire.
- This instrument contains no user-serviceable parts. Do not open the instrument or attempt to disassemble or modify the internal circuit.
- Never insert or remove an electric plug with wet hands.
- Check the electric plug periodically and remove any dirt or dust which may have accumulated on it.
- Do not place the power cord near heat sources such as heaters or radiators, and do not excessively bend or otherwise damage the cord, place heavy objects on it, or place it in a position where anyone could walk on, trip over, or roll anything over it.

⚠ *CAUTION*

Always follow the precautions listed below to avoid any possibility of serious injury or even death from electrical shock, short-circuiting, damages, fire or other hazards. These precautions include, but are not limited to, the following:

- Do not connect the instrument to an electrical outlet using a multiple-connector. Doing so can result in lower sound quality, or possibly cause overheating in the outlet itself.
- When removing the electric plug from the instrument or an outlet, hold the plug itself and not the cord. Pulling by the cord can damage it.
- Remove the electric plug from the outlet when the instrument is not to be used for extended periods of time, or during electrical storms.
- Do not place the instrument in an unstable position where it might accidentally fall over.
- Before moving the instrument, remove all connected cables.
- When setting up the product, make sure that the AC outlet you are using is easily accessible. If some trouble or malfunction occurs, immediately turn off the power switch and disconnect the plug from the outlet. Even when the power switch is turned off, electricity is still flowing to the product at the minimum level.
- When you are not using the product for a long time, make sure to unplug the power cord from the wall AC outlet.
- Use only the stand/rack specified for the instrument. When attaching the stand or rack, use the provided screws only. Failure to do so could cause damage to the internal components or result in the instrument falling over.

▮▮▮▮▮ Information for Users on Collection and Disposal of Old Equipment

This special symbol on the products, packaging, and/or accompanying documents means that used electrical and electronic products should not be mixed with general household waste.
For proper treatment, recovery and recycling of old products, please take them to applicable collection points, in accordance with your national legislation and the Directives 2002/96/EC.
By disposing of these products correctly, you will help to save valuable resources and prevent any potential negative effects on human health and the environment which could otherwise arise from inappropriate waste handling.
For more information about collection and recycling of old products, please contact your local municipality, your waste disposal service or the point of sale where you purchased the items.
[For business users in the European Union]
If you wish to discard electrical and electronic equipment, please contact your dealer or supplier for further information.
[Information on Disposal in other Countries outside the European Union]
This symbol is only valid in the European Union. If you wish to discard these items, please contact your local authorities or dealer and ask for the correct method of disposal.

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REAL Audio is continuously working to the improvement of its systems and related documentation.
In any case, we reserve the right to change the specifications without notice but in the respect to the current legislation.

Disclaimer:
The information contained in this manual has been carefully checked and we believed is accurate at the time of publication.
In any case, we do not assume any responsibility for inaccuracies, errors or omissions nor any liability for any loss or damage resulting either directly or indirectly from use of the information contained in this manual.

TABLE OF CONTENTS

INTRODUCTION

REAL Audio R-502 is an advanced single-channel parametric equalizer conceived to offer to the 500 series user the superior audio performance of the REAL audio high level series products. The unit offers to the 500 user high reliability, rugged design, outstanding audio quality, versatility and ease of use typical of the tradition of REAL Audio products.

The **R-502** equalizer is based on the Livio Agentini' s "Single-Stage Parallel Configuration" patented design. This innovative phase coherent EQ design offers the lowest distortion/noise specifications, not available in other products.

The **R-502** filtering section offers three band LO, MID, HI controls (bell shape). The emphasis/de-emphasis control range is +/-14 dB, the three primary bands become nine by using three center frequency switches. The Q control value (narrow, mid, wide) is selected by three switches (one for each band).

A bypass button is used for a true analog by-pass function (LED).

To obtain an outstanding audio quality, no servo amplifiers are used in the **R-502** output stage so

<p style="text-align:center; color:red">IT IS NOT POSSIBLE TO UNBALANCE THE SEND OUT OF THE R-502.</p>

If you need an unbalanced connection for the **SEND** out follow the indications shown in APPENDIX B.

R-502 is the first of the serie of equalizer that REAL Audio conceived for the 500 series (the other models are R-503, R-504, R-505) in order to give to the user the best choice for its application.

The **R-502,** offers a very cool satin finish stainless steel or milk white-painted (RAL 9001) front panel and a semi closed stainless steel enclosure and has been designed to be compliant with the 500-series standard.

R-502 is dedicated (due to his absolute sonic level quality) to high professional vocal recordings, classical instruments, high dynamic range instruments such as drums and percussions.

REAL Audio products are designed and manufactured in Italy.

Housing

The **R-502** 3 Band Parametric Equalizer module has been designed to be compliant with the 500-series standard.

Installation Instructions

➢ Remove the R-502 module from the packaging.

➢ Turn off the 500-series enclosure and remove mains power.

➢ Find an empty slot in the 500-series rack and remove the 2 fastening screws, positioned one on the top of the enclosure and one the the bottom of the enclosure.

➢ Insert the R-502 into the empty slot in the 500-series enclosure, Be sure that the rear edge connector on the R-502 module mates correctly with the edge connector of the 500-series enclosure.

➢ Replace the 2 fastening screws through the top & bottom holes in the R-502 module and screw into the 500-series enclosure. The module must be secured into the enclosure before turning the mains on.

➢ Apply mains power into the 500-series enclosure and turn on.

➢ Connect the microphone, audio source or instrument and select the correct settings.

➢ The module is not designed to be hot-plugged, so please ensure the power to the 500-series lunchbox is OFF before inserting or removing a module (this recommendation is useful in order to protect the lunchbox and the connected units).
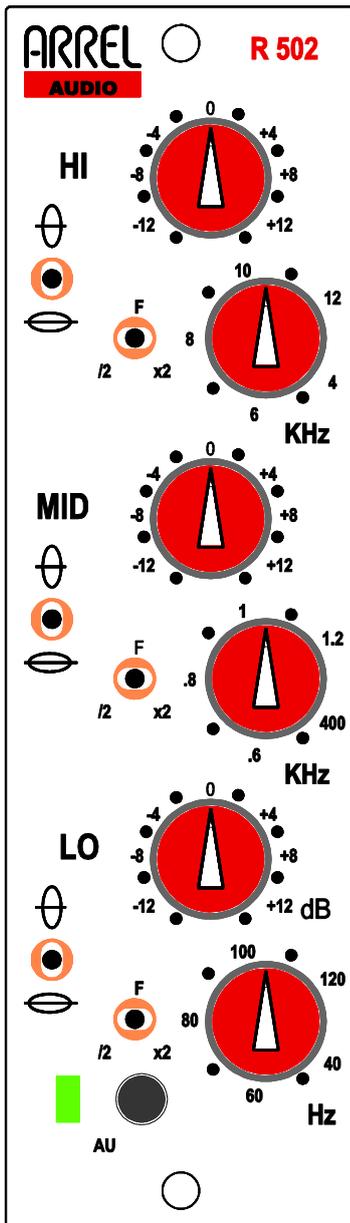
R-502 Front Panel Controls and Operations

The frequency and Q controls are available for the three frequency bands: HI, MID and LO.

CENTER FREQUENCY CONTROL KNOB

The frequency band can be easily tuned by rotating the frequency control knob.

FREQUENCY RANGE SWITCH

The frequency band control switch is used to modify the frequency band related to the center frequency control knob. Three positions are available: Frequency /2 , Frequency x 1, Frequency x 2.

EMPHASIS/DE-EMPHASIS CONTROL KNOB

Rotate the emphasis-de-emphasis control knob to change the frequency content in a range of ± 14 dB.

Q CONTROL SWITCH

Turn the toggle switch to change the Q. Three positions are available: narrow, medium, wide.

ON BUTTON

Push the button to turn on the equalizer (green LED on). Press again to switch to turn off the equalizer (green LED off).
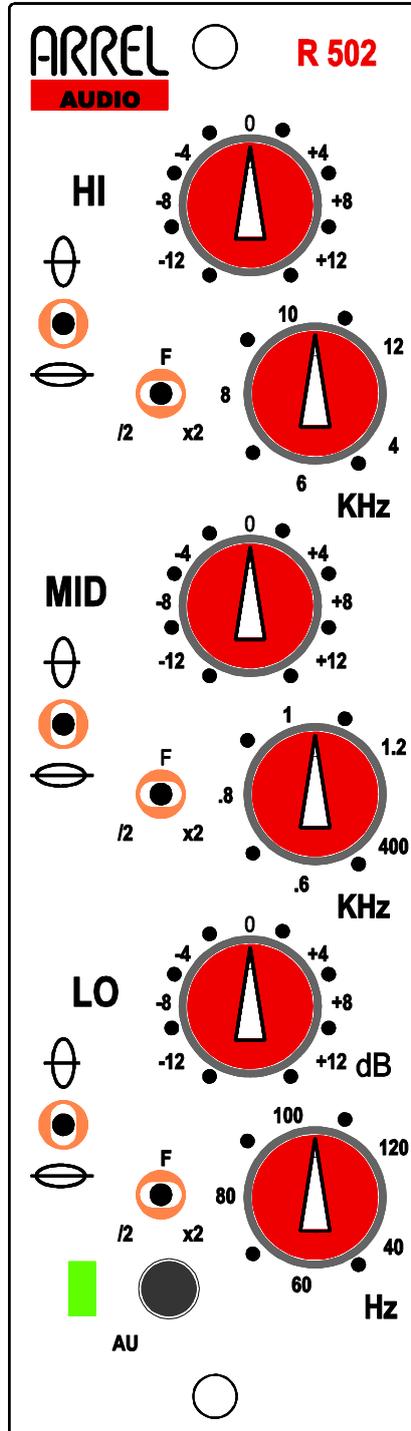
APPENDIX A: Front Panel

FIG. 1 R-502 Front Panel
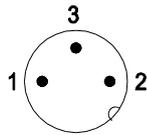
APPENDIX B: EXTERNAL CONNECTIONS

WIRING   R - 502

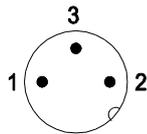LINE INPUT   XLR   On the back

3
1   2

1 = Ground
2 = PHASE +
3 = PHASE -

Balanced line - Can be unbalanced

MAIN OUTPUT   XLR   On the back

3
1   2

1 = Ground
2 = PHASE +
3 = PHASE -

Balanced line only   -   To use unbalanced lines
disconnect pin 3

FIG. 2 External connections

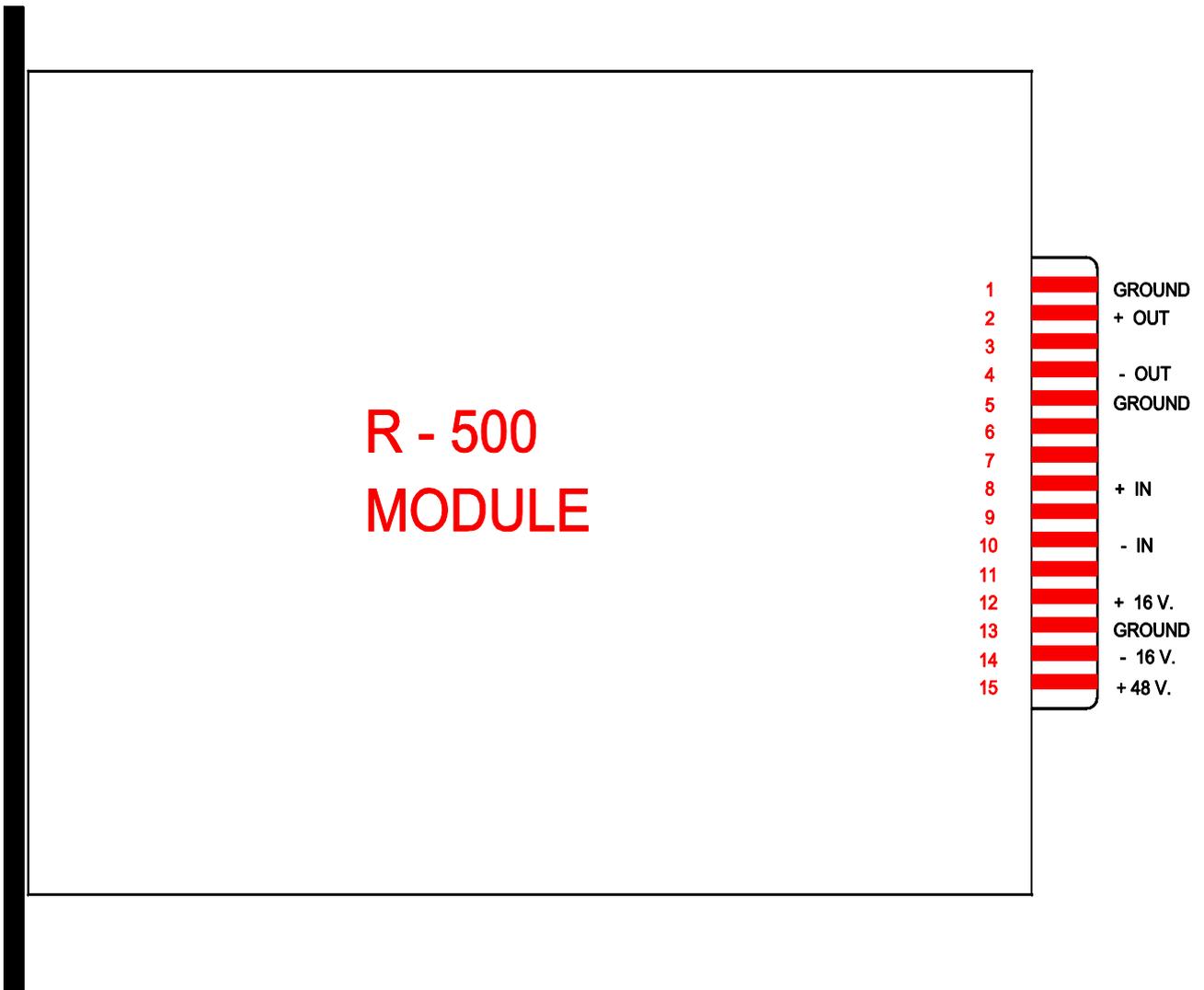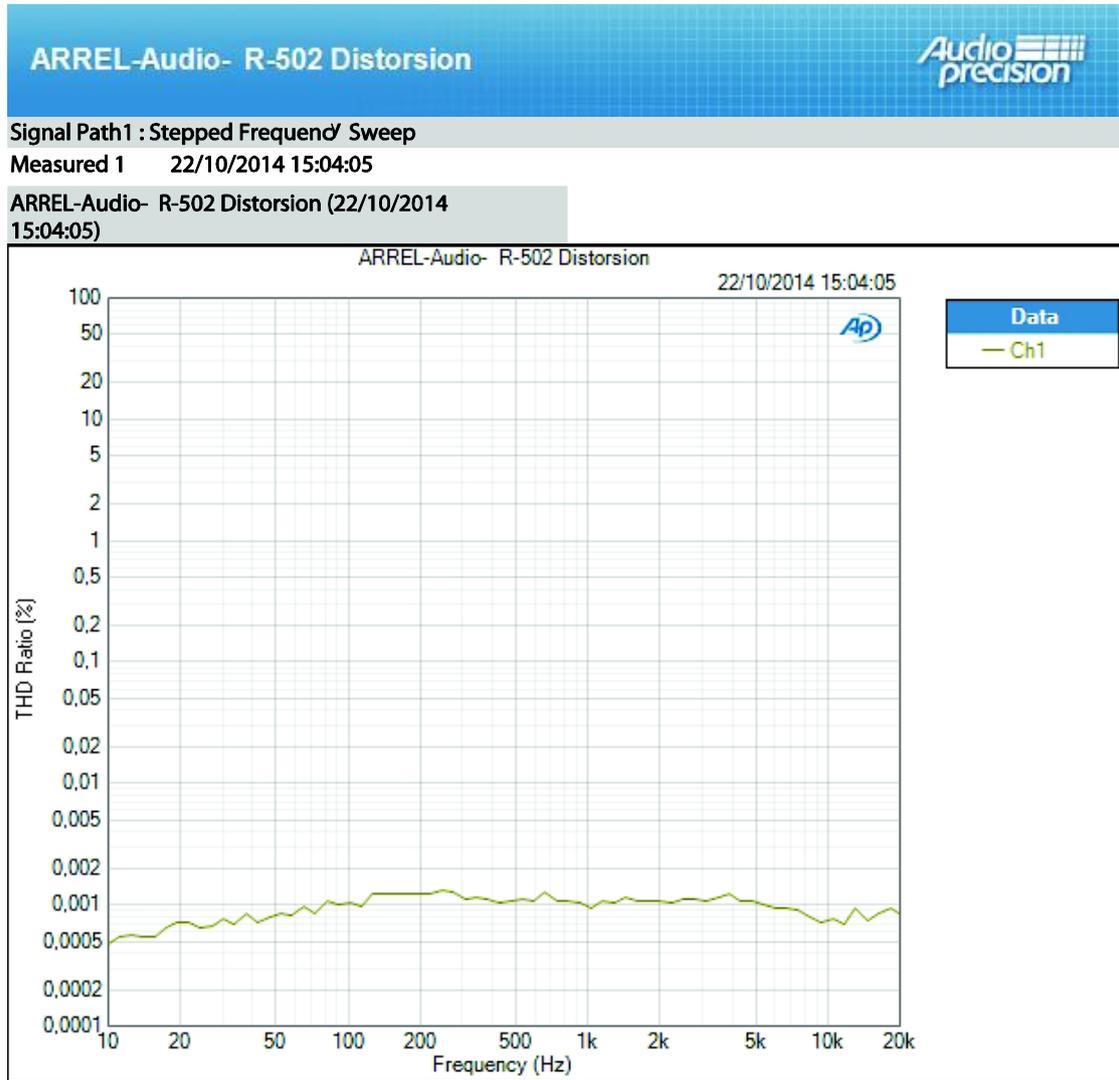# APPENDIX C: 500 series module edge connector

R - 500

MODULE

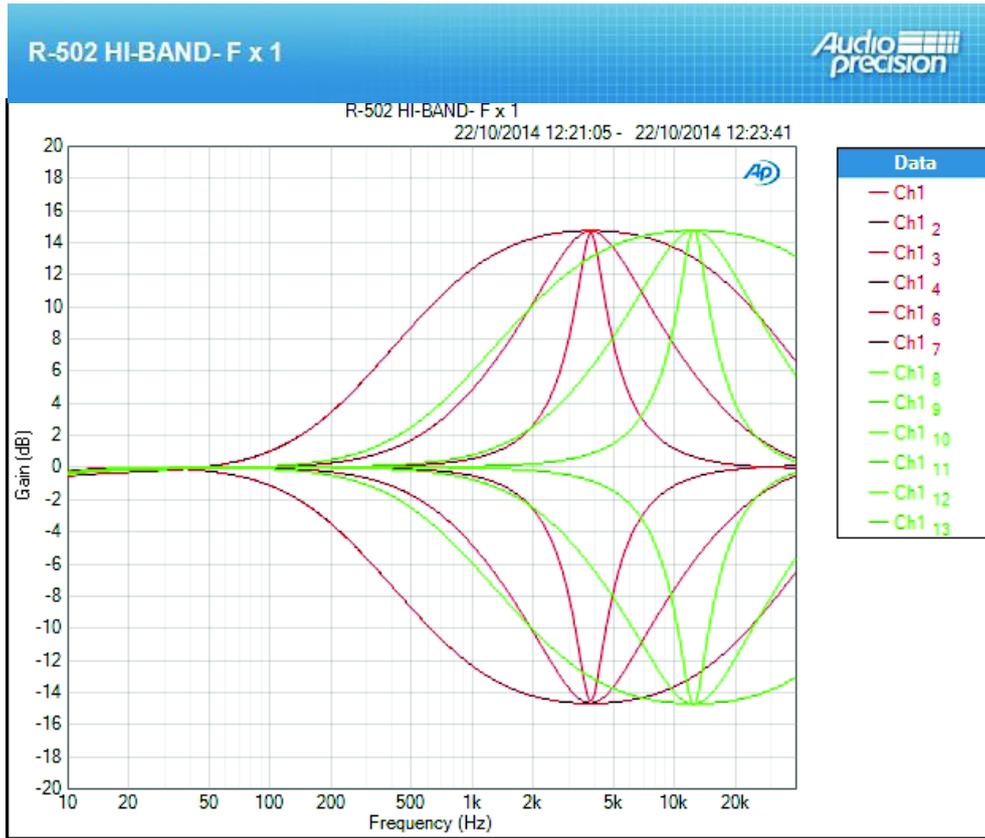|	
1	GROUND
2	+ OUT
3	
4	- OUT
5	GROUND
6	
7	
8	+ IN
9	
10	- IN
11	
12	+ 16 V.
13	GROUND
14	- 16 V.
15	+ 48 V.

FIG. 3 500 Series module edge connector

APPENDIX C: R-502 Measurements

FIG. 4 R-502 distorsion at +4 dBu

FIG. 5 R-502 HI band F x 1
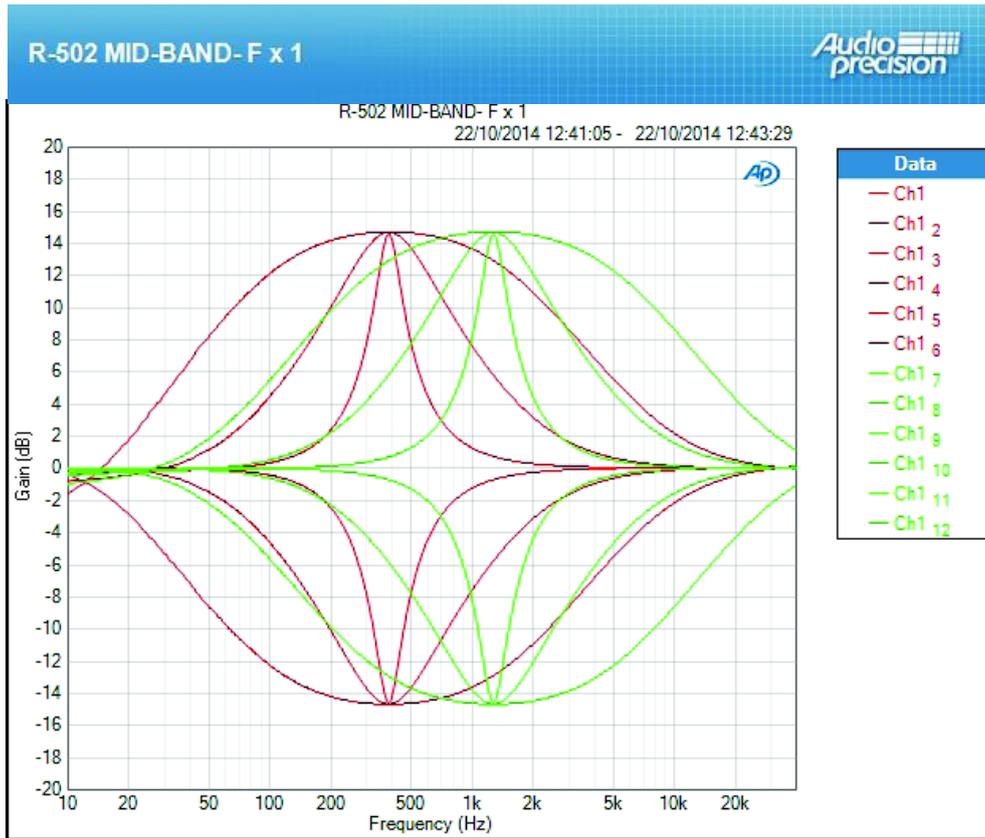
FIG. 6 R-502 MID band F x 1
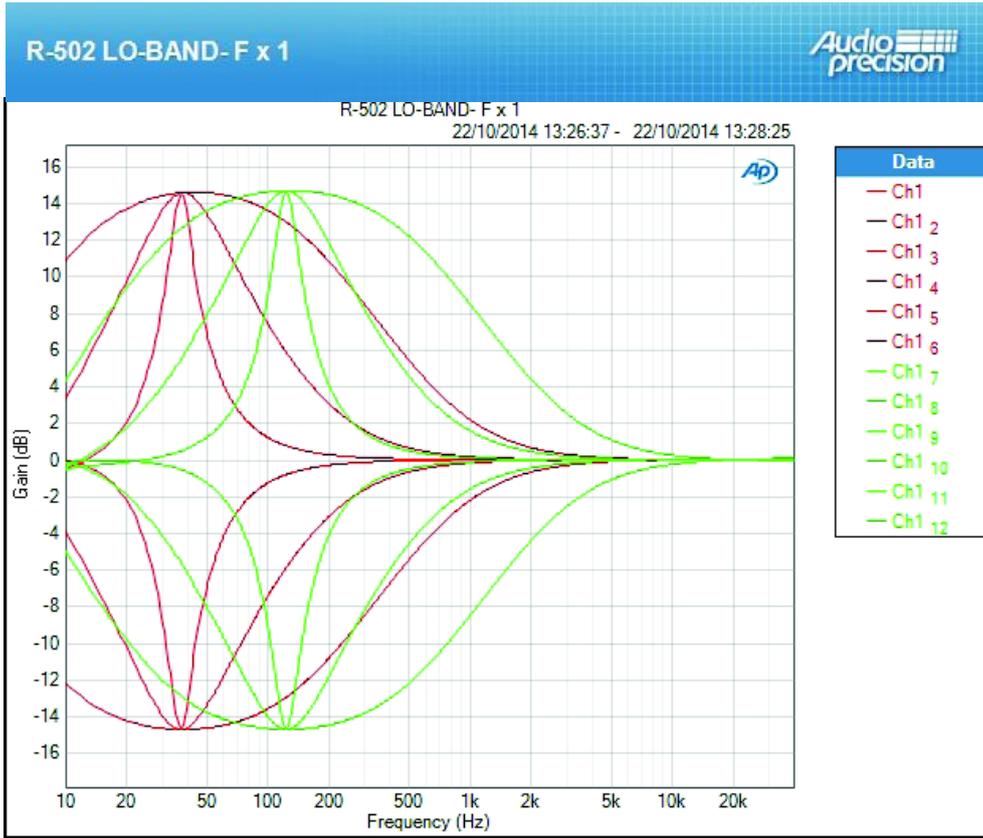
FIG. 6 R-502 LO band F x 1

TECHNICAL SPECIFICATIONS

Number of Channels:	1
Power Supply	± 16 VDC, very low power supply currents with respect to the 500 series standard
Line Input	Electronically Balanced, Impedance 20KΩ, Input Level +4dBu, Max +20 dBu.
Output	Electronically Balanced, Level +4 dBu, Max +28 dBu, Output Impedance 100 Ω
Bandwidth	6 - 300 KHz 0/-1dB, perfect square wave up to 50 KHz
Distortion + Noise	<0.003% (typical 0.001 %).
Front Panel Controls	True By-Pass button (LED), Gain (Emphasis/De-Emphasis) rotary control with center detect (3 controls), Range ± 14 dB, Center Frequency: rotary control (3 controls), Frequency band control; three positions switch (Frequency/2 , Frequency x 1, Frequency x 2 (3 controls), Q control: three positions switch (narrow , medium, wide (3 controls).
Frequency Bands	Controlled by 3 positions switches: LO: Bell shape 20/60 Hz (F/2), 40/120 Hz (F x 1) or 80/240 Hz (Fx2), MID: Bell shape 200/600 Hz (F/2), 400/1200 Hz (F x 1) or 800/2400 Hz (Fx2), HI: Bell shape 2.000/6.000 Hz (F/2) , 4.000/12.000 Hz (F x 1) or 8.000/24.000 Hz (Fx2).
Rear Panel Input Connectors	Series 500 compatible connector
Construction	Compliant 500-series rack with PSU and external audio connections, Single 500-series rack slot required for each R-501 module.
Dimensions	Series 500 compatible module
Weight	500 g