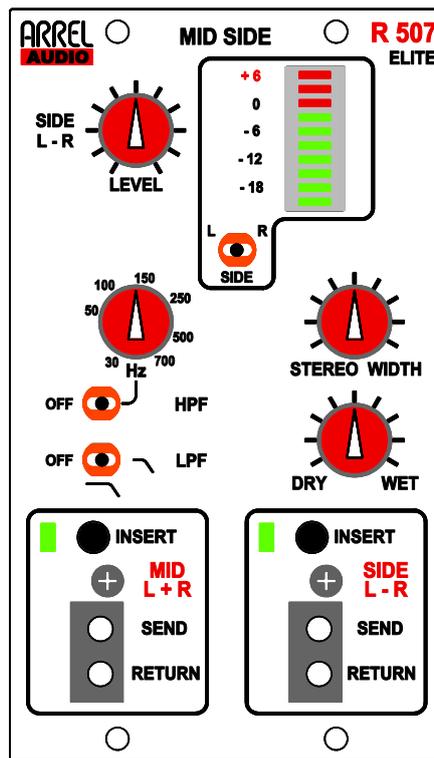




R-507 Mid-Side Unit



User Manual

Issue 0.0

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.

ARREL Audio Contacts

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ARREL 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.

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INTRODUCTION

The **ARREL Audio R-507** is a new MID-SIDE unit characterized by an outstanding sound quality and a number of new functions that are not available on other MID-SIDE units on the market. At present the R-507 is the first MID-SIDE unit available for the 500 series.

The **R-507** is an advanced Mid/Side analog processor designed by ARREL Audio for the 500 series to comply with the demands of professional recording and mastering engineers. Mid/Side processing is based on the coding of a stereo signal into two components. The "Mid" channel contains the information that appears in both the left and right channels, and the "Side" channel contains all the information that differs between the left and right channels.

Once encoded into M/S, these two signals can be processed independently, before being decoded back into L and R channels. The M/S technique gives more control over the width of the stereo image than techniques based on microphone placement techniques. The R-507 is a code/decode mono/stereo system to be used primarily for mastering and recording.

On top of its amazing sound quality, the R-507 MS unit features a unique set of functions. The L-R channel gain control gives the maximum Signal/Noise ratio and the optimum headroom in the audio path. This fact is important when compressors/limiters are used as inserts in the MID-SIDE audio path.

The L-R processing section contains HPF (LO-CUT) and LPF (HI-CUT) filters.

HPF filter parameters: 30-700 Hz (12 dB/Oct) control knob.

LO-CUT filter: two fixed frequencies (3500 Hz and 7000 Hz) (12dB/Oct).

INSERT points are available to connect outboards on the front panel (Bantam) in order to elaborate the L-R and L+R channels.

In this unit the wet and dry signals can be mixed together.

An insert switch (illuminated by a LED) is available on the front panel to activate the connected outboard.

The R-507 features a multifunction VU meter to display: the L-R level and the L and R output channels.

Housing

The **R-507** Mid Side Unit module has been designed to be compliant with the 500-series standard. Two slots are used to install the **R-507**.

Installation Instructions

- Remove the R-507 module from the packaging.
- Turn off the 500-series enclosure and remove mains power.
- Find two empty slots in the 500-series rack and remove the 4 fastening screws, positioned one on the top of the enclosure and one the the bottom of the enclosure.
- Insert the R-507 into the empty slots in the 500-series enclosure. Be sure that the rear edge connector on the R-507 module mates correctly with the edge connectors of the 500-series enclosure.
- Replace the 4 fastening screws through the top & bottom holes in the R-507 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.
- The module is not designed to be hot-plugged, so please ensure the power to the 500-series enclosure is OFF before inserting or removing a module (this recommendation is useful in order to protect the 500 enclosure circuits, our product due to a very robust construction could be hot-plugged without problems).

R-507 Front Panel Controls and Operations

The R-507 input stage is based on a differential amplifier so it is “electronically balanced”. The standard input level for the **R-507** is + 4dBu.

CODING SECTION

After the input stage, the **L** and **R** audio signals are processed by the analog processor (matrix) to obtain the **L+R** and **L-R** signals.

The **L+R** signal being the summation of two signals is in the range [0, +6dB], while the **L-R** signal is in the typical range of [0, -60 dB] (usually -20 dB). Those levels are typical levels and their value depends exclusively on the characteristics of the **L** and **R** signals.

In the R-507, the **L+R** is equalized at a standard amplitude level while the **L-R** channel is equipped with a gain control to obtain a +4 dBu signal at the input of the L-R channel. This fact is important when compressors/limiters are used as inserts in the MID-SIDE audio path.

L-R LEVEL KNOB

The L-R level knob is used to chain the gain at the input of the L-R chain

HPF (LO-CUT) SWITCH

The HPF switch is used to activate the LO-CUT filter.

HPF (LO-CUT) KNOB

The HPF knob is used to change the cut-off frequency of the LO-CUT filter. The frequency range is 30-700 Hz (12 dB/Oct)

LPF (HI-CUT) SWITCH

The HPF switch is used to activate the LO-CUT filter and to choose one of the two LO-CUT frequencies (3500 Hz and 7000 Hz).

INSERT CONNECTORS

The insert Bantam connectors on the front panel are used to connect outboards in order to process the L-R and the L+R channel. The four connectors correspond to balanced line level lines.

INSERT SWITCH

The insert switches are used to activate the insertion of the outboards connected to the insert XLR connectors.

DRY/WET KNOB

The DRY-WET knob is used to mix the DRY L-R channel with the processed L-R channel.

STEREO WIDTH KNOB

This knob controls the level of the L-R channel before the reconstruction of the stereo image.

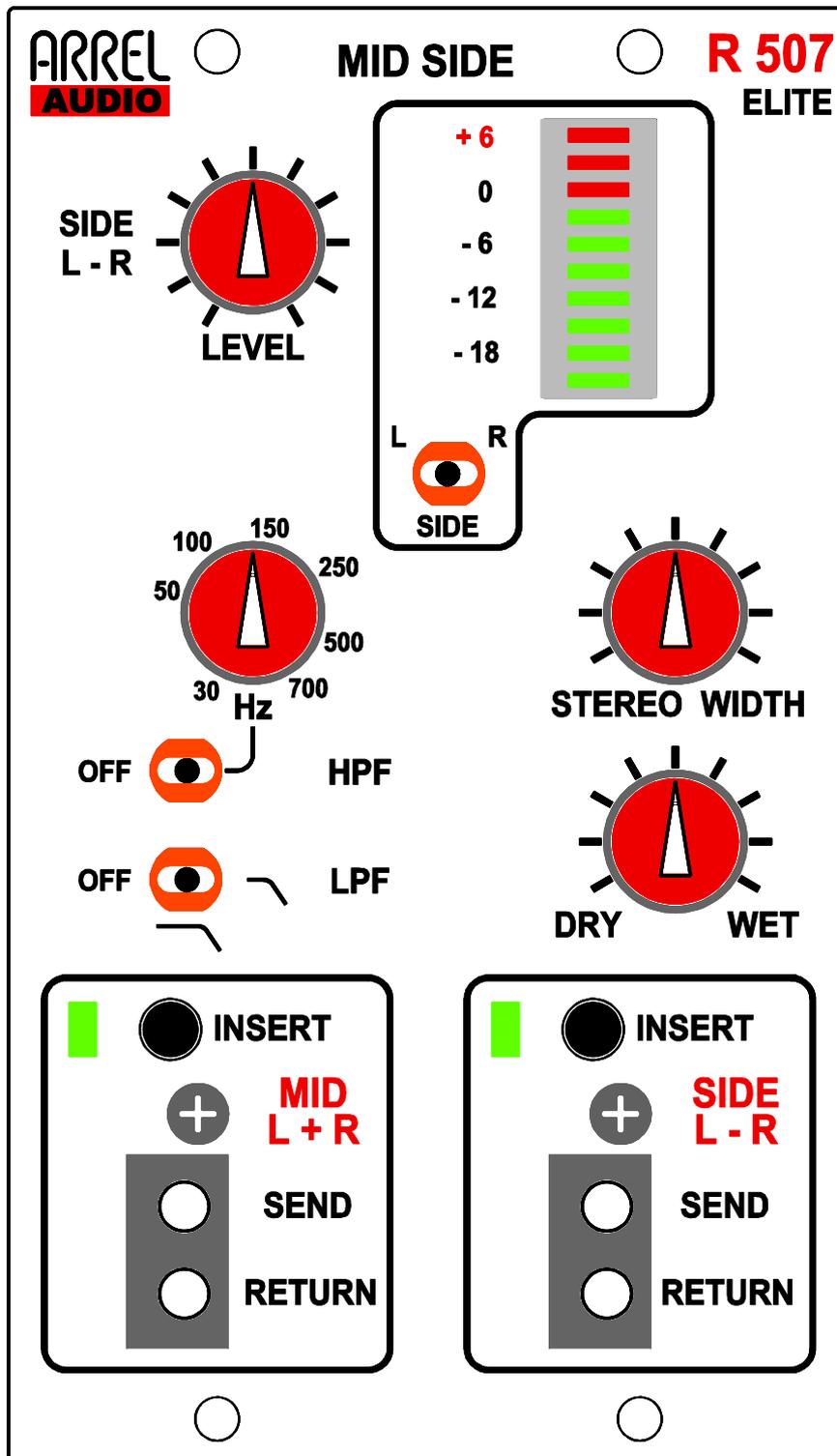


Fig.1 R-507 front panel

VU METER SWITCH

The VU switch is used to select different signals at the input of the VU meter (Input L-R level after gain control, LEFT and RIGTH right output channels.)

BAR GRAPH DISPLAY

A 10 led bar graph display is used to visualize the audio level.

APPENDIX A: Front Panel

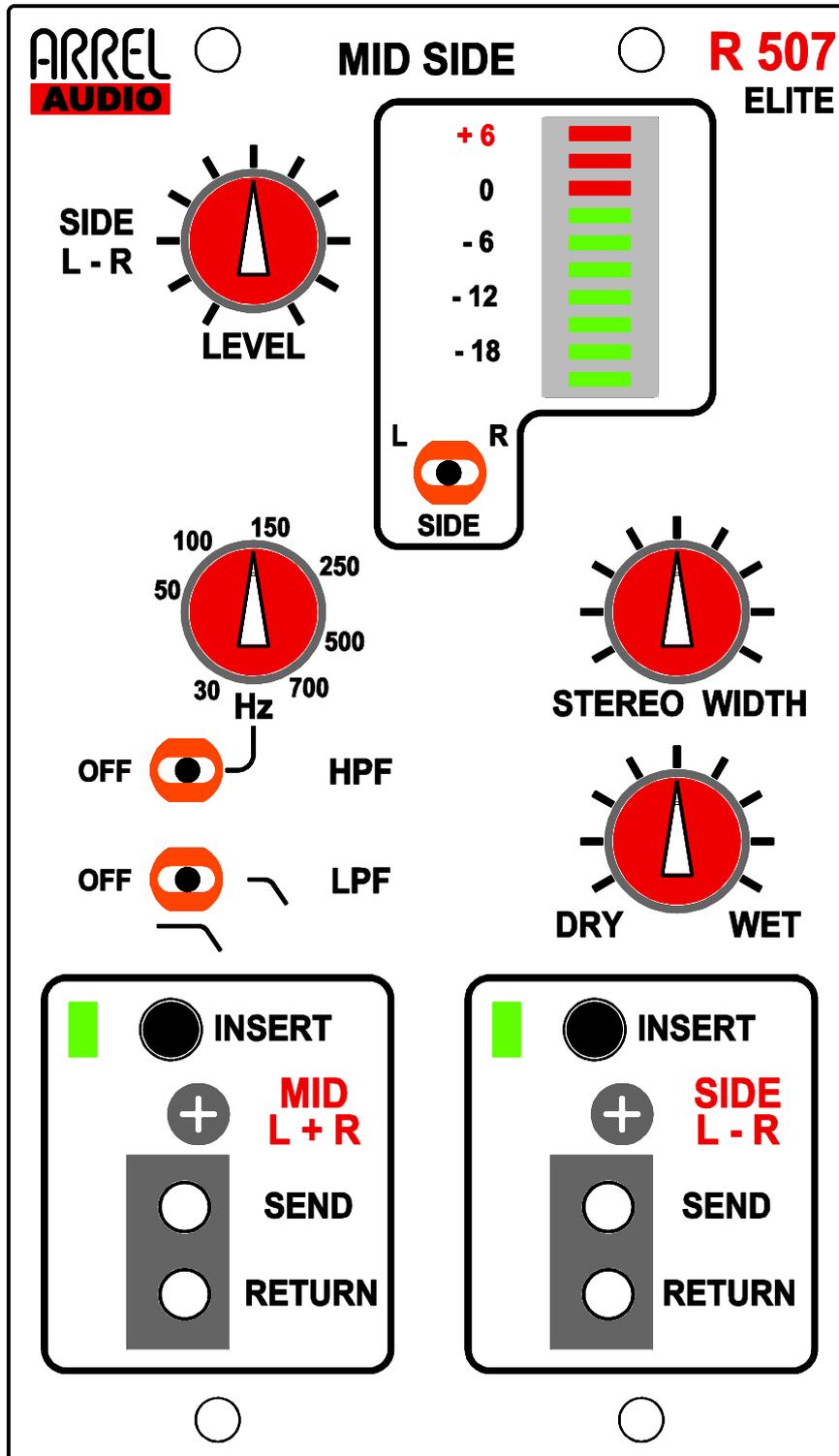


FIG. 2 R-507 front panel

APPENDIX B: EXTERNAL CONNECTIONS



WIRING R - 507

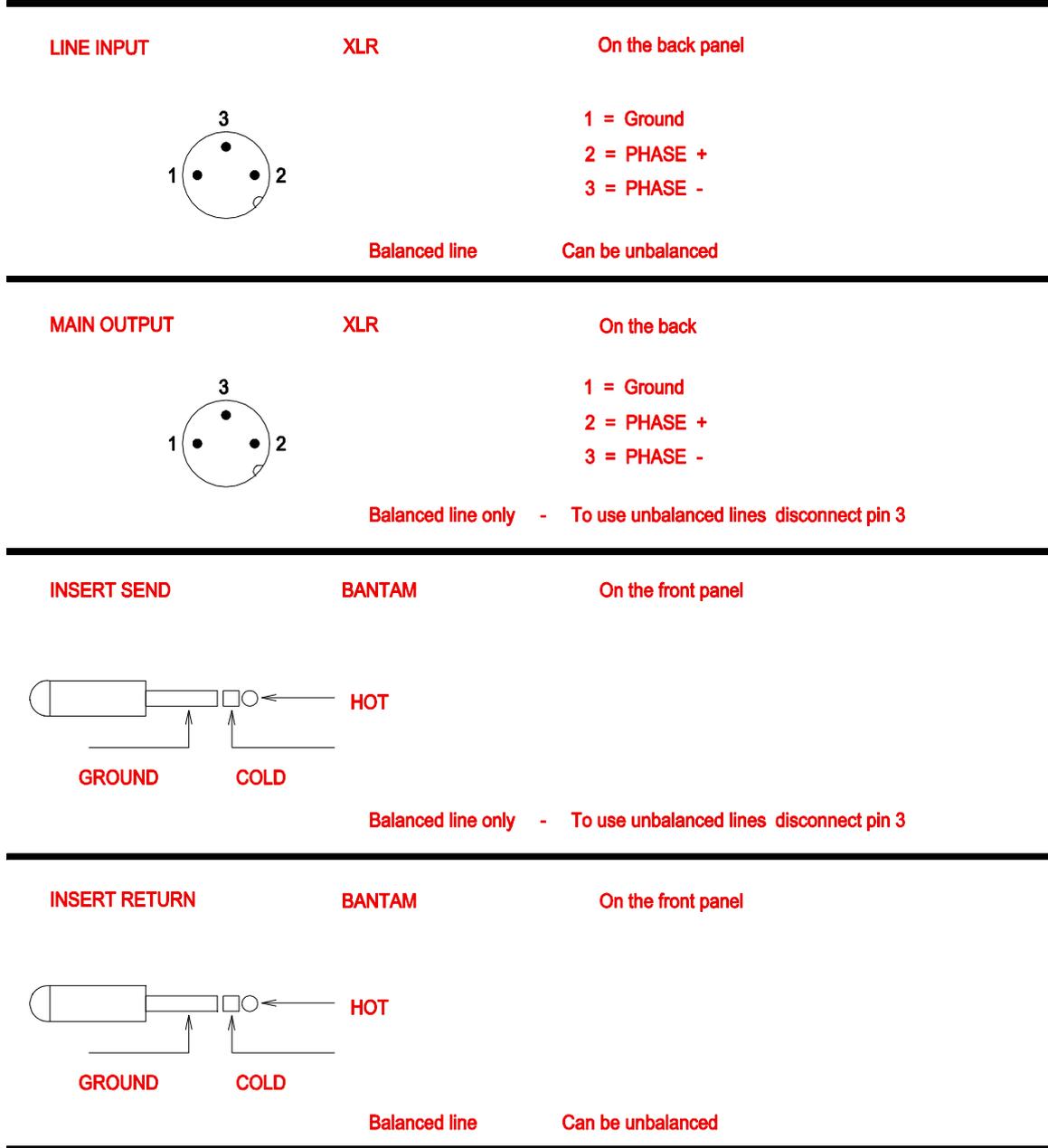


FIG. 3 External connections

APPENDIX C: 500 series module edge connector

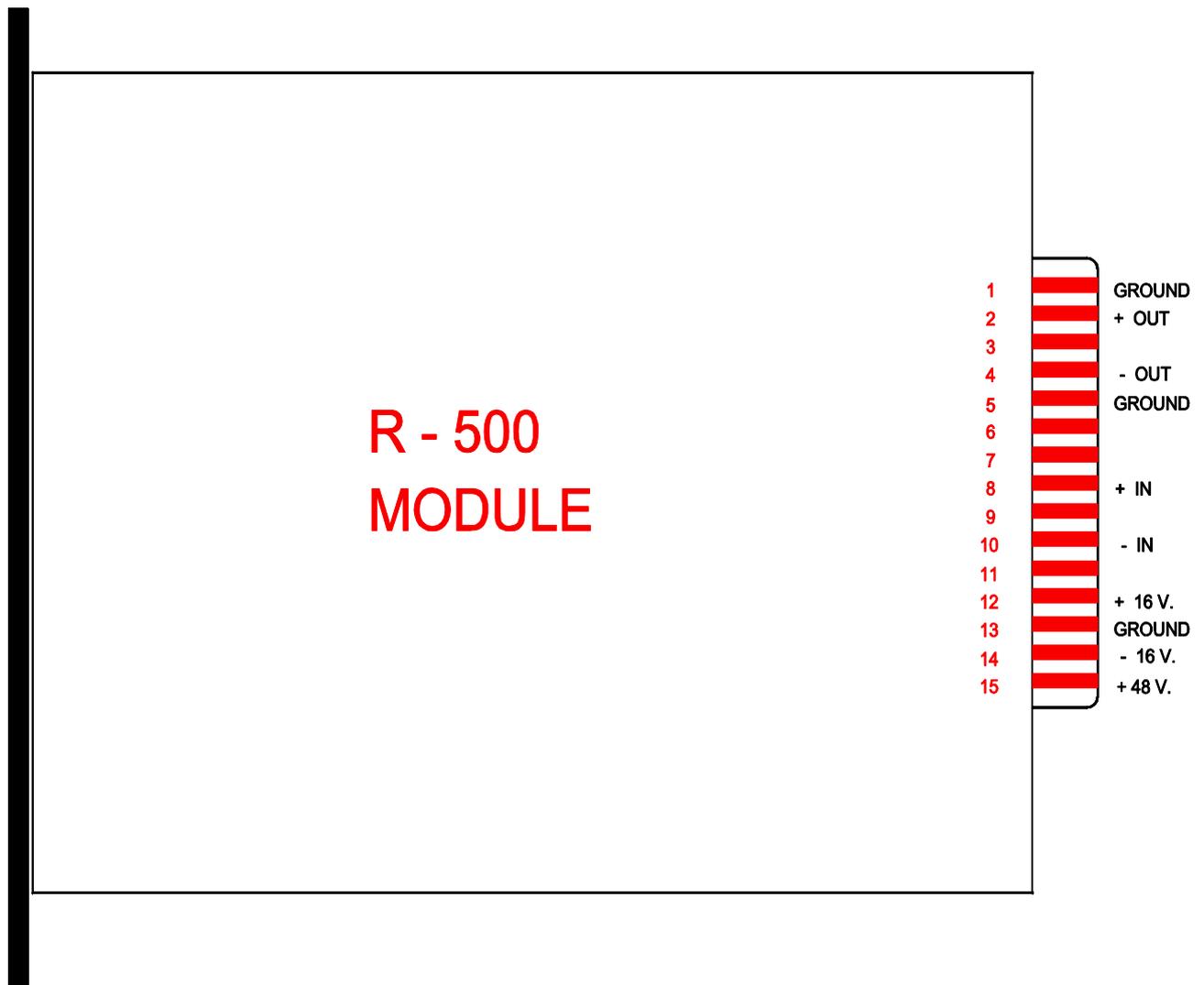
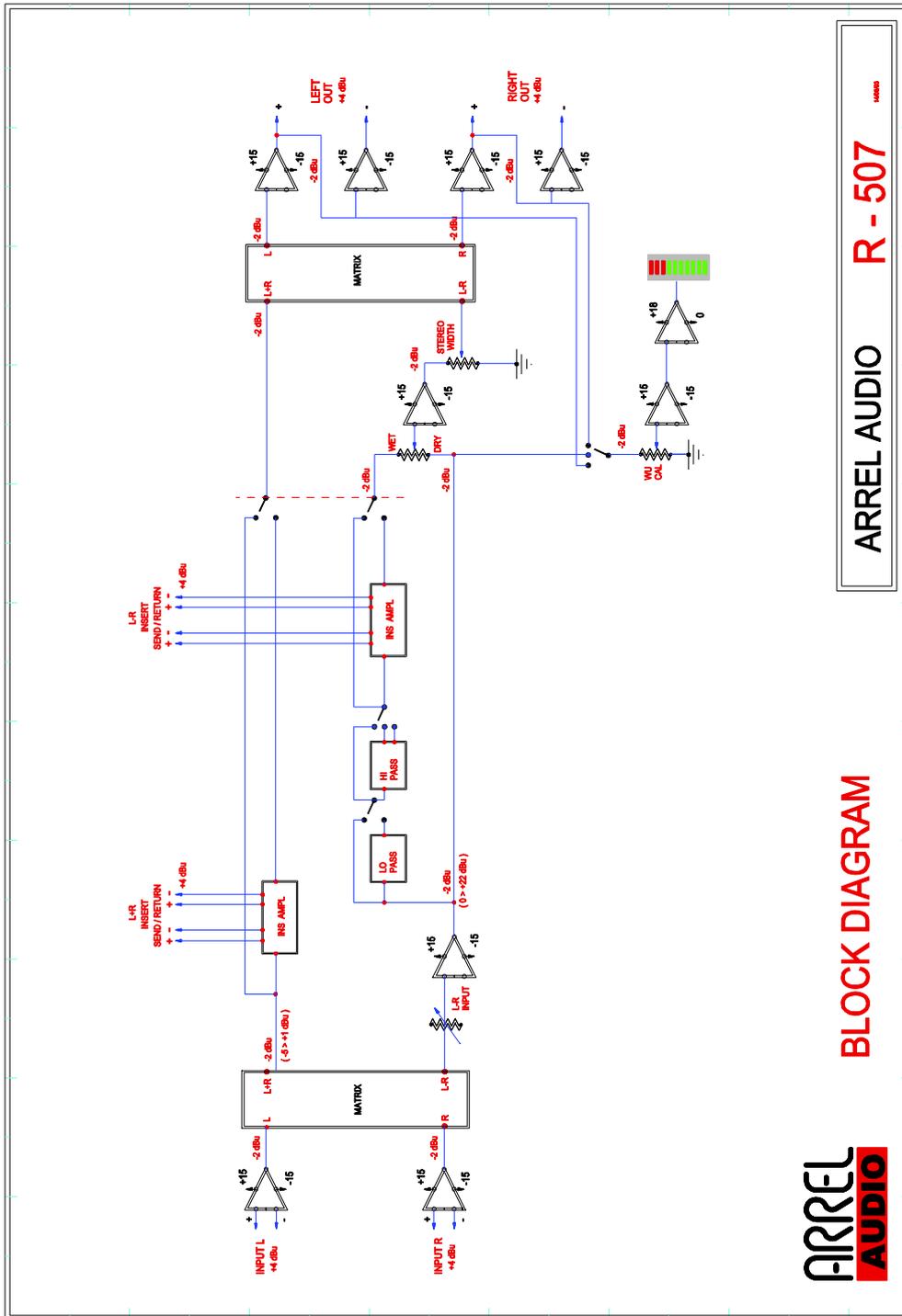


FIG. 4 500 Series module edge connector

APPENDIX D: Block Diagram



ARREL
AUDIO

BLOCK DIAGRAM

ARREL AUDIO R - 507

FIG. 5 R-507 Block Diagram

TECHNICAL SPECIFICATIONS

Power Supply	±16 VDC, very low power supply currents with respect to the 500 series standard
Input	Electronically Balanced, Impedance 20KΩ, Input Level +4dBu, Max +24 dBu.
Output Level	Electronically Balanced, Level +4 dBu, Max +26 dBu, Output Impedance 100 Ω
Bandwidth	5 - 200.000 Hz -1dB, perfect square wave up to 20 KHz
Distortion + Noise	<0.005% (typical 0.001 %).
L-R Filters	LPF (HI-CUT) with 2 frequencies (3500 Hz, 7000 Hz) HPF (LO-CUT): 30-700 Hz
Front Panel Controls	L-R INPUT LEVEL HPF (LO-CUT) SWITCH HPF (LO-CUT) KNOB LPF (HI-CUT) SWITCH DRY-WET KNOB STEREO WIDTH VU METER SWITCH
Front Panel Indicators	10 led bar graph display
Rear Panel Input Connectors	500 series compatible connector (two standard units)
Construction	Compliant 500-series rack with PSU and external audio connections, Two 500-series rack slots are required for each R-507 module.
Dimensions	Series 500 compatible double module
Weight	500 g