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# RMA-02

## Studio Quality Stereo Monitor Amplifier



The RMA-02 *“Challenger”* is a very special Studio Quality, High Power Dual Channel Audio Power Amplifier designed specifically as a Professional Reference Monitoring Amplifier for use in Recording Studios and other demanding applications including home use as the ultimate Hi-Fi Stereo Amplifier

We have chosen the name *“Challenger”* for the RMA-02 for a couple of good reasons

We challenge you, to nominate a better sounding Monitor Power Amplifier, and also challenge you, to nominate a Loudspeaker System the RMA-02 is unable to drive well

Basically, the RMA-02 is a very civilised amplifier, designed for accurate and uncoloured reproduction of voice and music, ranging from the softest human whisper to the loudest of musical passages

The RMA-02 is 2 RU Rack Mounting, and being a dedicated Monitor Amplifier, free from unnecessary switches and indicators, and not having cooling fan, it is mechanically quiet, allowing installation in the Studio Control Room or other Critical Listening Area

### **PURPOSE:**

The main purpose of the RMA-02 is to provide a near perfect and yet affordable Reference Monitor Amplifier for use with conventional professional or other high quality Passive Monitor Loudspeaker Systems during critical Recording, Mix-down and Final Mastering processes

The Frequency Response and Balance between individual Loudspeaker Driver units in Professional Passive Monitor Loudspeaker Systems is normally completely stable being controlled by passive components selected and trimmed by the original manufacturer, making such loudspeaker systems suitable as Reference Monitors

Conversely, Active Bi-Amped or Tri-Amped Loudspeaker Systems containing Active Crossover Components, individual Power Amplifiers and Gain Trim-Pots, often adjustable by the user who can inadvertently disturb the balance can be treacherous and misleading if used as Reference Monitors

It is recognised that some Passive Monitor Loudspeaker Systems are difficult to drive, causing the driving Power Amplifier to produce some difficult to explain, but subtle and unpleasant distortion and “Cloudiness” effects, particularly noticeable with amplifiers featuring heavy negative feedback

Careful Listening Tests involving several different Loudspeaker Systems indicates that the RMA-02 is not affected by speaker load characteristics, nor does it appear to be sensitive to type of Speaker Cable as exhibited by some amplifiers

## **TECHNICAL:**

The design of the RMA-02 is completely conventional in some aspects, and quite unusual in others reflecting several thoughts and ideas from a variety of sources relating to Audio Power Amplifiers

### ***Conventional Design Features are***

Unregulated Power Supply, using two sets of Rectifier Diodes connected as Back to Back Bridge Rectifiers providing separate + and – 70 Volt DC Power Supplies to each amplifier channel

Input Conditioning, featuring Op-Amp type Balanced Line Level Inputs and Gain restoring stages following the Input Gain Control Potentiometers

### ***Unusual Design Features are***

Complete construction of Power Amplifiers using Complementary Bipolar Transistors, considered by Elan Audio and discerning Hi-Fi “Buff’s” to produce better quality sound than FET’s and MOSFET’s

Completely symmetrical design providing identical and complementary circuitry for positive and negative section of the amplifier

Generous use of Emitter Degeneration to limit individual stage gain, making the design uncritical of individual Transistor Matching

Three stage Emitter Followers in both positive and negative output producing an output stage current gain of about 1 Million

Robust, Complementary, High Voltage, High Gain, 40 MHz Output Transistors in Parallel Push-Pull configuration, 4 Output Transistors per amplifier channel

Partially divided LF and HF Feedback Loops, provides heavy negative feedback at low frequencies giving very low distortion and high damping factor as required for good Low Frequency Loudspeaker Performance, and moderate negative feedback at high frequencies making the RMA-02 extremely tolerant of the loading imposed by the Loudspeaker, Crossover Network, and Speaker Cable effects

The reduced HF Feedback does give a slight rise in High Frequency Distortion, which audibly is of no concern, but vastly improves the ability of the Amplifier to drive real loads such as actual Loudspeaker Systems rather than benign “Dummy Load Resistors”

The RMA-02, due to the design topography of the output stage, is not a Power Efficient Amplifier, but designed to exhibit completely benign and symmetrical overload behaviour

It is believed by Elan Audio that the unusual negative feedback arrangement coupled with the very high current gain (and relatively inefficient) output stage are the main factors why the RMA-02 is capable of producing “Unclouded, Free and Open” sound at low as well as high audio levels

## **WARNINGS:**

The RMA-02 is a very Powerful Audio Amplifier, it can “Purr like a Kitten” or “Roar like a Lion” and destroy loudspeakers of inadequate power rating, so please be careful

It is designed purely for use as a Studio Monitor or High Grade Stereo Hi-Fi Amplifier with adequate power reserve and headroom for that type of duty

It is **NOT** provided with forced Air Cooling, nor does it have a Power Transformer suitably rated for Disco or Stage Sound Applications, and should **NEVER** be considered for such use under any circumstances

## **PERFORMANCE:**

Completely Adequate for Professional Studio Monitoring and demanding Stereo Hi-Fi applications

**TECHNICAL SPECIFICATIONS: Typical Measured Figures**

## RMA-02 "Challenger" Studio Monitor Amplifier

Inputs	Balanced Hi-Z	XLR Type Connectors
Outputs	Unbalanced	Binding Post-Banana Plug Socket

Frequency Response:	+0 – 0.1 dB	10 Hz to 20 KHz
	-0.5 dB	32 KHz
	-1.0 dB	40 KHz
	-2.0 dB	60 KHz
	-3.0 dB	75 KHz

Output Noise	Wideband	- 60 dBmW
	20 Hz to 20 KHz	- 64 dBmW
	400 Hz to 20 KHz	- 65 dBmW

## Signal to Noise Ratio, 100 Watts Out

Wideband	98 dB
20 Hz to 20 KHz	102 dB
400 Hz to 20 KHz	103 dB

Channel Separation	1 KHz	85 dB
	10 KHz	75 dB

## Harmonic Distortion into 8 Ohms

1W	100 Hz	0.01%
1W	1 KHz	0.01%
1W	10 KHz	0.05%
10W	100 Hz	0.01%
10W	1 KHz	0.01%
10W	10 KHz	0.05%
100W	100 Hz	0.015%
100W	1 KHz	0.02%
100W	10 KHz	0.20%

Intermodulation Distortion	50 Hz and 400 Hz	0.01%
	50 Hz and 4 KHz	0.03%

Maximum Power Output per channel, depending on AC Mains Voltage present

Note: Power Ratings, for cooling considerations are short term only, NOT Continuous

8 Ohm Load	200 Watts RMS
4 Ohm Load	300 Watts RMS
2 Ohm Load	400 Watts RMS

Power Supply	220 V to 270 V AC 50 to 60 Hz
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Power Consumption Idle	Nominally 30 VA depending on set Bias Current
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Power Consumption Active	Power Delivered x 2.5 + 30 VA Approximately
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Construction	2 RU Rack Mounting, all Aluminium, Painted Front Panel
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Dimensions Unpacked	W 482.6mm x H 88.9mm x D 370mm
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Weight Unpacked	6 KG
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