

Application & Purpose:

Exceptionally high quality stereo valve phono-amp, based on the classic Marantz 7 circuit, but with lower noise and distortion.

Dual gain stage with a current follower and active RIAA equalisation. Achieves very low levels of THD < 0.002%.

Input loading can be adjusted with jumper switches; 0pF, 47pf, 100pF, 220pF

Low output impedance with sufficient current to drive a pre-amp or power amp, plus an additional line-level output.



WARNING: Very high DC voltage device. Care must be taken to avoid fatal electric shock.

Specification:

PCB Dimensions	139mm x 56mm x 1.6mm
Channels	Two (stereo)
Input Capacitance	Selectable - 0pF, 47pf, 100pF, 220pF
Devices	2 x 12AX7 valves 1 x 12AU7 valve
Output Impedance	< 800Ω
Gain	40dB (x100) at 1000Hz
Phono EQ	RIAA
Supply Voltage	285v and 245v DC (regulated power supply module available)
Idle Supply Current	25mA
Transformer	220v +/- AC 12-20VA
Earth Nets	Power and Audio (separated by loop breaker)
THD	Typically < 0.002% at 1kHz

Details:

An exceptionally high-quality stereo audio phono-amplifier featuring a dual gain stage with feedback and a current follower. Based on the classic Marantz 7 circuit, but this is not a clone. It has lower noise and distortion due to slightly increased current in the gain stages. An ultra-linear power supply provides virtually ripple-free DC reducing distortion and noise even further. THD at 1kHz is below 0.002%

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Low output impedance with sufficient current to drive a pre-amp or power-amp plus an additional line level input.

Input loading can be jumper-switched between 0pF, 50pF, 100pF and 220pF. 0pF is selected by removing the jumper.

Setup and Usage:

This module is usually installed in a ZinAmp enclosure with the input at the front of the amp; this may appear to be back-to-front. This is to keep the input away from the transformers and eliminate any electromagnetic noise from the transformer windings. It is usual to use an audio grade toroidal transformer with a goss band to further eliminate noise.

The valves generate latent heat and require ventilation. This is achieved in the ZinAmp installation with holes in the top of the chassis through which the valves protrude.

Running this module in a sealed box with no ventilation will result in device failure and thermal damage to surrounding components. Do not attempt this.

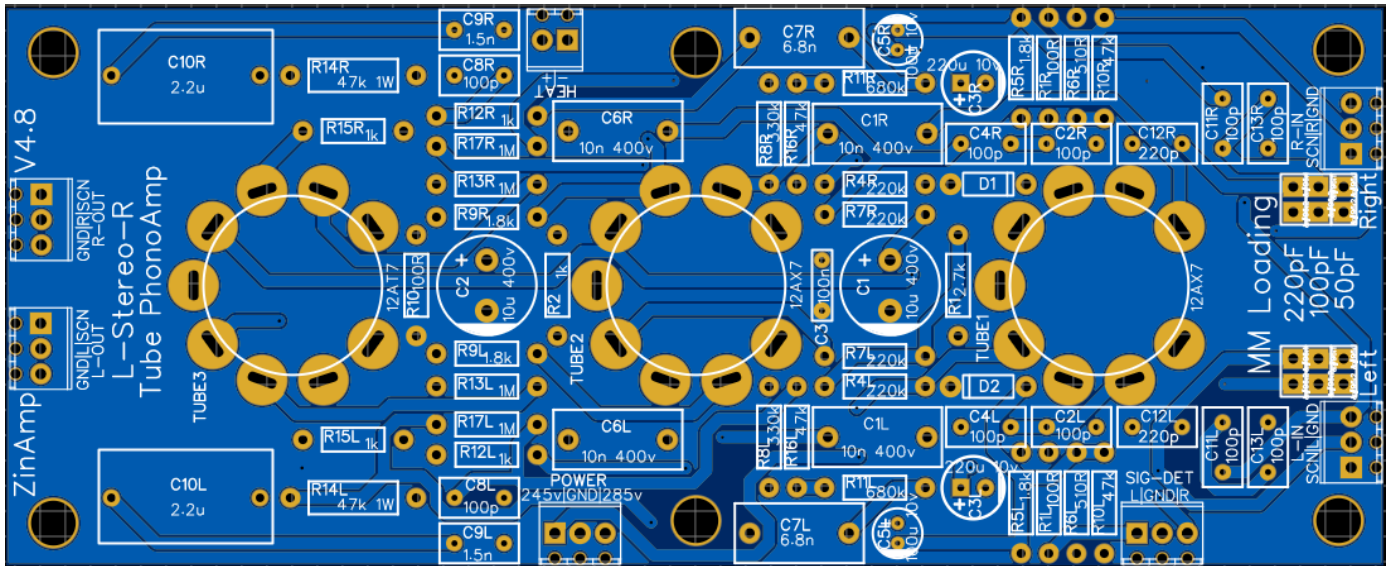
The module requires 2 x 12AX7 valves and 1 x 12AU7 or 12AT7 valve, as indicated on the PCB and ZinAmp chassis etchings. A 12AT7 will give a slightly lower output impedance than a 12AU7, but no real audible difference. The first two valves closest the input must be 12AX7s

Individual ground nets separate the audio and power grounds, eliminating hum. Power ground should make its own separate direct connection to the ground star or hub, definitely not to the Power Supply filter capacitors. Audio ground should be connected to the preamp or line-in audio ground.

Safety Note:

This module runs with DC voltages that are close to 300v. Unlike AC current, DC is more dangerous when touched as you will tend to stick to it rather than be repelled from it as with AC. Before handling this module, switch off, disconnect the AC power lead and discharge the High Voltage Power Supply by placing a screwdriver accross its discharge terminals for 10 seconds. Check the voltage with a meter - if less than 2v, it is safe to handle.

Bare PCB:



Connections:

Connector	Terminal	Destination	Notes
L-OUT	L	Volume Control or Selector Switch	
	SCN	Cable Screen (Power Ground)	Screen should be connected to Audio Ground (not power ground)
	GND	Left Channel Phono Input of your installation -ve terminal	
R-OUT	R	Volume Control or Selector Switch	
	SCN	Cable Screen (Power Ground)	Screen should be connected to Audio Ground (not power ground)
	GND	Left Channel Phono Input of your installation -ve terminal	
SIG DET	L	Signal Detector	Signal Detector is an optional module
	R	Signal Detector	Signal Detector is an optional module
	GND	Signal Detector	Signal Detector is an optional module
L-IN	L	Left Channel Phono Input of your installation +ve terminal	
	GND	Audio Ground	
	SCN	Cable Screen (Power Ground)	Cable screen is not connected at the

			phono-jack input. Doing so will cause hum
R-IN	L	Right Channel Phono Input of your installation +ve terminal	
	GND	Right Channel Phono Input of your installation -ve terminal	
	SCN	Cable Screen Cable Screen (Power Ground)	Cable screen is not connected at the phono-jack input. Doing so will cause hum
HEAT	+/-	+12.6V and Ground on your low voltage Power Supply	Do not connect the -ve terminal to Audio Ground
Power	245v GND 285v	Phono Terminals on your HV Power Supply	Do not connect the GND terminal to Audio Ground

Parts List:

CONNECTORS: Both blank and ready-built PCB requires connectors be purchased and soldered on by the constructor. This is to give the constructor a choice of how they wire their own particular installation. Terminal block connectors are indicated in the list below, but can be swapped for equivalent 2.54mm pitch connectors e.g. Molex KK254 headers, which are provided to the constructor in kits with ready-made wiring.

Designator	Value/Spec	Qty	Manuf.	Manufacturer Part	RS Part
C10R,C10L	2.2u	2	Panasonic	ECWFE2W225JA	105-1076
C12L,C12R	220p	2	Wima	FKP2/220/100/5	484-1984
C1R,C1L,C6L,C6R	10n 400v	2	Kemet	R463F210040N0M	126-2227
C2,C1	10u 400v	2	RS-PRO	711-2034	711-2034
C2L,C2R,C4R,C4L,C8R,C8L,C11R,C11L,C13L,C13R	100p	10	Wima	FKP2/100/100/5	484-1978
C3	100n	1	Epcos	B32529C1104K009	896-1341
C3R,C3L	220u 10v	2	NIC	NRSZ221M10V6.3X11F	737-4119
C5R,C5L	100u 10v	2	Rubycon	10ZL100MEFC5X11	703-7223
C7R,C7L	6.8n	2	Epcos	B32621A0682J000	896-1568
C9R,C9L	1.5n	2	Wima	FKP2/1500/100/5	115-708
D1,D2	50v 1A	2	Vishay	1N4001-E3/54	628-8931
HEAT	2 Pole Terminal (self-wire only)	1	RS-PRO	790-1098	790-1098
L,R	3 Row Jumper	2	Harwin	M20-9980346	745-7046
PHON-L,PHON-R,POWER,SIG-DET,A-OUT	3 Pole Terminal (self-wire only)	5	RS-PRO	790-1092	790-1092
R1	2.7k	1	TE Connectivity	LR1F2K7	125-1161
R10,R1L,R1R	100R	3	TE Connectivity	LR1F100R	125-1155
R11R,R11L	680k	2	Vishay	MRS25000C6803FCT00	683-4250
R12R,R12L,R15R,R15L	1k	4	Vishay	MRS25000C1001FCT00	683-3165
R13R,R13L,R17R,R17L	1M	4	Vishay	MRS25000C1004FCT00	683-4159
R14R,R14L	47k 1W	2	Vishay	ROX1SJ47K	214-1355
R16R,R16L,R10R,R10L	47k	4	TE Connectivity	LR1F47K	148-893
R2	470R	1	TE Connectivity	LR1F470R	125-1158
R4L,R4R,R7R,R7L	220k	4	TE Connectivity	LR1F220K	149-060
R5L,R5R,R9R,R9L	1.8k	4	Vishay	MRS25000C1801FCT00	683-3231
R6R,R6L	510R	2	TE Connectivity	LR1F510R	148-433
R8L,R8R	330k	2	TE Connectivity	LR1F330K	149-105
TUBE1,TUBE2	12AX7	2	See Kit List	See Kit List	See Kit List
TUBE3	12AU7 or 12AT7	1	See Kit List	See Kit List	See Kit List

Parts available from [RS Online](#). Also try [Farnell](#), [Mouser](#) and other online suppliers. Parts from different manufacturers can be substituted where spec is sufficient

Supplier trading names may differ by country.